Evidence-based medicine among medical students from Sofia: Attitude and knowledge survey

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Abstract

Aim: To investigate the attitude of undergraduate medical students towards evidence-based medicine (EBM), as well as to assess their knowledge in the area of EBM and their relevant educational needs.

Methods: This was a cross-sectional study conducted among the sixth year medical students during their internship in Social Medicine between September 2013 and September 2014. Primary data was collected through a self-administered questionnaire.

Results: The students appreciated the importance of EBM for clinical practice but, at the same time, they perceived their own knowledge in this area as partial and insufficient. The students demonstrated poor capacity for working with databases, as well as poor knowledge on terms used in EBM literature.

Conclusion: Currently, the Medical Faculty in Sofia fails to fulfill its general educational goals and outcomes regarding the obtainment of knowledge and skills in the field of EBM. This obvious educational deficit should be gradually tackled by introducing relevant training in EBM.

Keywords: evidence-based medicine, medical students, skills, training.

Introduction

Evidence based medicine (EBM) is an integration of individual clinical expertise with best up-to-date scientific evidence, as well as with values and informed choice of the patients (1). Therefore, the practice of EBM is a continuous process, directed to professional development of medical practitioners and constant updating of their knowledge (2).

In the last decade, a number of medical universities include training in EBM in their curricula. The training in EBM is integrated within undergraduate and postgraduate levels, as well as within preclinical and clinical subjects. Educational content of this training includes basic knowledge in clinical epidemiology, skills to formulate structured clinical questions, skills to search in databases, skills to critically evaluate the scientific literature, and skills for application of evidence (3-8).

Basically, there is recognition within the European Union on the need of development of knowledge and skills in EBM as a basic competence which has to be acquired by all doctors. The quality of medical education in Europe has to allow medical doctors to easily integrate into different health systems and facilitate their mobility within Europe.

On the other hand, the general educational goals and results, adopted by the Medical Faculty in Sofia, require students of the Faculty at their graduation to have mastered the principles and competencies of EBM and to be able to: apply evidence in clinical practice; carry out the literature search on a specific problem; and appraise critically the scientific publications (9).

The aim of this study was to investigate the attitude of the sixth year medical students towards EBM, as well as to assess their knowledge about EBM and their relevant educational needs. Thereby, the study indirectly aimed to establish the extent to which the Medical Faculty in Sofia currently performs its own educational goals and results.

Methods

The survey was conducted among the sixth year medical students during their internship in Social Medicine between September 2013 and September 2014. The study design was cross-sectional. Primary data was collected through a self-administered questionnaire. The questionnaire was distributed to all 193 students attended the internship with a request to respond to the questions. Of the overall 193 students, 172 of them answered the questionnaire. The refusals to participate amounted for 11%.

The study instrument was specifically designed to meet the planned objectives using the literature on the topic (10-18). It was mainly based on the questionnaire of McColl (10) for studying attitudes and knowledge of EBM among general practitioners and on the questionnaire of Kaltchev for studying attitudes to EBM of medical doctors from different specialties (11). The items of the questionnaire covered six key areas: attitude of students towards EBM; main obstacles to its implementation into practice as perceived by the students; students' knowledge on basic terms encountered in the literature on EBM; status of education in EBM; self-assessment of students about their ability for independent clinical activities upon their graduation from the Medical Faculty in Sofia; demographic characteristics. The questionnaire was pre-tested in a pilot study of 31 sixth-year medical students and was adapted to the Bulgarian background.

Statistical data processing was carried out with the statistical package SPSS, version 13.0 using descriptive analysis and tests to assess relationship between variables. P-values of ≤ 0.05 were considered as statistically significant.

Results

Demographic characteristics

Mean age of respondents was 24.8 years with a range from 24 years to 30 years. Gender ratio (males/females) was 92/80. In the age distribution dominated students of the age 25 years (62.2%).

The majority of respondents (90.7%) declared that they had used a foreign language at a level to understand without difficulty scientific literature, and 4.7% did not use a foreign language to such an extent. The majority of students declared to speak English (84.3%). Nevertheless, 94.2% of respondents intended to specialize in any medical specialty.

General understanding and attitude towards EBM

The majority of the respondents (71.5%) demonstrated an understanding of the basic idea behind the concept of EBM (Table 1). For the remaining respondents, EBM was limited to only one of its structural components, or they were not able to express any opinion.

Table 1. Understanding of evidence-based medicine (EBM)

"What do you understand by EBM?"	**Number**	**%**
System of scientific evidence	36	20.9
Personal clinical expertise	4	2.3
Information about patients	6	3.5
Integration between personal clinical expertise, scientific evidence and patient's values	123	71.5
I cannot answer	3	1.7
Total	**172**	**100**

With respect to the benefits of EBM in their future clinical practice, 74.4% of respondents believed that EBM would benefit them and only 4.7% of the students declared that they would not benefit from EBM in the real practice. Most of respondents also had a positive attitude towards the benefits of research in daily practice (88.4%), which confirmed again the overall positive element in the attitude of students towards EBM.

Statistically significant relationships between gender and some variables were found. For example, males were more familiar with the basic principles and applications of EBM than females (P=0.023), but the size effect was considered weak (Cramer's V=0.24). Similarly, males were more likely to assess research as useful for everyday practice but, again, there was evidence of a weak relationship (P=0.006, Cramer's V=0.25).

Working with databases and sources of evidence

More than half of the students (64.5%) reported that they had not used a bibliographic database for literature review in person or through someone else within the last year. The remaining 35.5% of the respondents had conducted such a search in a database with a different frequency.

The main barriers for the use of databases in daily practice and medical training, as they were perceived by the sixth year medical students, are presented in Table 2. In the first place, the students perceived the lack of practical skills for working with databases. While the lack of such skills could be compensated by suitable training, more demonstrative was the next main barrier indicated by the students – namely, the lack of interest. Lack of time was ranked third, followed by inappropriate technical conditions and personal inertia.

Table 2. The main barriers perceived by the students

Perceived barriers	Number	%
Lack of practical skills for working with database	45	26.2
Lack of interest	35	20.3
Lack of time	27	15.7
Inappropriate technical conditions (lack of Internet or computer)	25	14.5
Personal inertia	24	14,0
Insufficient foreign language proficiency	6	3.5
Lack of funds	6	3.5
Without answer	4	2.3
Total	**172**	**100**

Furthermore, respondents received a list of well-known medical journals, publications of systematic reviews and databases associated with EBM and they were asked to refer to their awareness about these sources in four levels: "do not know"; "know, but do not use"; "read" and "would use in clinical decision making in future practice". The most widely read database by the students, leading among all sources both in English and Bulgarian, was MEDLINE: 19.2% of the respondents reported to read this source. In contrast, only 1.7% of the students declared that they had read the Cochrane Database of Systematic Reviews, and only 2.3% declared that they had read the Database of Abstracts of Reviews of Effectiveness.

Knowledge in the field of EBM

Although most of the students knew the definition of EBM, only 9.3% of them stated that they were fully aware of the basic principles and applications of EBM. Over half of respondents (54.7%) considered that they were only partially familiar with them, and another 25% believed that they didn't know them enough. Complete ignorance on the principles and applications of EBM was declared be 9.3% of the students.

Students who were fully or partially familiar with the principles of EBM exhibited a stronger tendency to believe that it would be beneficial in clinical practice and this dependence was expressed strongly ($P<0.01$, Cramer's $V=0.41$).

Although 55.2% of respondents remembered that they were trained in EBM within their sixth year of education in Medical Faculty-Sofia, only 4.1% of them answered that they were trained in formulating structural clinical questions, whereas 2.3% of them declared that they were aware of PICO model. On the other hand, while 33.7% of the students claimed to know what a critical appraisal was, only 11% of them remembered to be trained in this subject. Likewise, 23.8% of the students reported that they were aware about search strategies of scientific evidence but only 8.7% of them had been trained in these methods. In addition, students received a list of technical terms that are found in the publications associated with EBM, and they were asked to assess their own level of understanding (Table 3). General understanding of the terms ranged from 6.6% to 23.3% for individual terms, which does not indicate a good level of knowledge.

Table 3. Understanding of basic terms

BASIC TERMS	It would not be helpful for me to understand	Don't understand but would like to	Some understanding	Understand and could explain to others	Without response
	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)
Relative risk	3 (1.7%)	18 (10.5%)	90 (52.3%)	40 (23.3%)	21 (12.2%)
Absolute risk	3 (1.7%)	18 (10.5%)	90 (52.3%)	40 (23.3%)	21 (12.2%)
Systematic review	6 (3.5%)	42 (24.4%)	75 (43.6%)	28 (16.3%)	21 (12.2%)
Odds ratio	15 (8.7%)	76 (44.2%)	43 (25%)	17 (9.9%)	21 (12.2%)
Meta analysis	9 (5.2%)	64 (37.2%)	65 (37.8%)	13 (7.6%)	21 (12.2%)
Clinical effectiveness	0 (0%)	30 (17.4%)	91 (52.9%)	30 (17.4%)	21 (12.2%)
Number needed to treat	3 (1.7%)	85 (49.4%)	49 (28.5%)	14 (8.1%)	21 (12.2%)
Sensibility	6 (3.5%)	30 (17.4%)	84 (48.8%)	31 (18%)	21 (12.2%)
Specificity	6 (3.5%)	30 (17.4%)	84 (48.8%)	31 (18%)	21 (12.2%)
Positive predictive value	9 (5.2%)	87 (50.6%)	45 (26.2%)	10 (6.6%)	21 (12.2%)
Negative predictive value	9 (5.2%)	87 (50.6%)	45 (26.2%)	10 (6.6%)	21 (12.2%)
Confidence interval	23 (13.4%)	68 (39.5%)	45 (26.2%)	15 (8.7%)	21 (12.2%)
Heterogeneity	7 (4.1%)	62 (36%)	58 (33.7%)	24 (14%)	21 (12.2%)
Publication bias	10 (5.8%)	60 (34.9%)	51 (29.7%)	30 (17.4%)	21 (12.2%)

In this study, 14.5% of the students appreciated their ability for independent clinical activities in real clinical situations as "poor" and 1.7% of them defined it as "very poor" (Table 4).

Table 4. Perceived self-ability to act in real clinical situations

Perceived self ability to act in real clinical situation	Number	Percent
Excellent	3	1.7
Very good	11	6.4
Good	55	32.0
Average	67	39.0
Poor	25	14.5
Very poor	3	1.7
Can not appreciate	4	2.3
Without response	4	2.3
Total	**172**	**100**

However, a positive element of the study is that a significant part of medical students perceived their ability to act independently in real clinical situations in their future practice as average (39%), good (32%), and very good (6.4%).

Discussion

In Sofia, the sixth year medical students appreciate the importance of EBM for clinical practice, but at the same time they perceive their own knowledge in this area as partial and insufficient. The students also demonstrate insufficient capacity for working with databases. As the main obstacle interfering with the use of available databases within the training process, as well as within their clinical practice, students identify the lack of skills for working with informational data sources, which is an indication of insufficient and unreliable training. This negative trend is also complemented by the second major obstacle indicated by the

respondents – the lack of interest in the field of EBM, which can be interpreted as a deficit of integrated training to set-up working skills and habits, which in turn maintain interest.

Subjectively perceived low level of knowledge in the field of EBM is confirmed by the declared poor knowledge of basic technical terms associated with EBM, as well as by the ignorance of the basic steps of EBM. On the other hand, the poor knowledge in EBM is expected and predictable and is a sign of a serious deficit in the training of medical students from Sofia in an important scientific field such as EBM.

In conclusion, at this stage, the Medical Faculty in Sofia fails to fulfill its general educational goals and outcomes regarding the formation of knowledge and skills in EBM. It is necessary that this clear educational deficit be compensated by introducing relevant training in EBM structured under appropriate forms. In this respect, according to numerous studies of educational practices in the field of EBM, as the most reliable is considered the integrated form of training, where the principles and practices of EBM are taught within clinical background in which they can be applied directly (19-22). The adequate prior training in clinical epidemiology and research methodology is also essential for students because it is a solid basis. It is also important to support students and young doctors in the process of searching and applying the evidence into everyday practice.

Conflicts of interest: None declared.

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