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IMPACT ON HEALTHCARE PROFESSIONALS AFTER A WORKSHOP IN FIRST TWO STEPS OF EVIDENCE BASED MEDICINE

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ABSTRACT

Objective: To determine the effectiveness of delivering a single workshop in evidence based medicine by comparing the pre and post workshop scores to ascertain level of knowledge and skills of formulating an answerable question and EBM literature searching skills among healthcare professionals.

Design: Single center quasi-experimental study.

Setting: PNS SHIFA Karachi, Pakistan Navy Medical Training School.

Participants: Volunteers in four groups including postgraduates group 1, undergraduate group 2, nursing student group 3 and medical technician group 4.

Intervention: Eight workshops (two per group) of EBM literature searching skills were carried out with pre and post evaluation through first two questions of Fresno tool.

Results: A total of 102 participants were enrolled with 17 (16.6%) postgraduates, 34 (33.33%) undergraduates, 31 (30.4%) nursing students and 20 (19.6%) medical technicians. There was statistically significant improvement after the workshop in mean Fresno scores of individual groups. Mean pre and post workshop scores of different groups were nursing students 0.68 and 2.89, medical technicians 0.80 and 3.55, postgraduates 2 and 4.17, undergraduates 1 and 4.97 respectively.

Conclusions: A single EBM brief workshop has a statistically significant impact on the competence level of healthcare professionals in first two EBM steps.

Keywords: Evidence based medicine, EBM, literature searching skills, healthcare professionals.

INTRODUCTION

Healthcare professional competency in respective disciplines is demonstrated step wise through a process including knowledge, competence (specific to the task), performance, action and involves problem solving skills, teamwork and communication skills[1]. Assessment of competence can be directed to any one of these domains. Evidence Based Medicine (EBM) concept evolved in 1992 and has been described as the integration of clinical expertise and patient values with the best available research evidence[2]. EBM follows five key steps including; 1) Converting clinical scenarios into a structured answerable question; 2) Searching the literature to identify the best available evidence in order to answer that question; 3) Appraising critically the evidence for its validity and applicability; 4) Applying the results of the appraisal into clinical practice and finally 5) Self evaluation following the EBM steps[2]. In the present era within the practice of medicine there is an emerging requirement of training in evidence-based practice (EBM) at all levels of education for all health care professionals[3].

All the EBM steps require demonstration of a different level of competence and therefore, assessment tools must also evaluate varied competency levels at each of these steps. A Cochrane systematic review has documented studies with positive effects of teaching EBM critical appraisal skills to healthcare professionals. The primary focus of these studies has been on medical students, residents, physicians and only a few have been conducted with other professionals including nurses[3]. In the literature many studies have been conducted to evaluate participants' critical appraisal skills but

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in comparison, few studies have been carried out to evaluate participants' literature searching skills[4]. Several papers have concluded that Fresno and Berlin assessment tools are the only instruments developed to evaluate all steps of the EBM process with established validity and reliability[3,5-8]. Currently, Fresno test (FT), Adapted Fresno test and Modified Fresno test are the most frequently used EBM assessments tools[9,10]. Consequent upon these studies, training in EBM has now been incorporated into most medical curricula worldwide with the intention to promote lifelong learning amongst the medical professionals[4]. However, there is still ongoing evaluation of the best teaching methodology, assessment modalities and impact of such intervention on EBM competency amongst medical students, residents and healthcare professionals[11-16].

On the contrary, exposure to EBM training and education is negligible in resource-poor countries like Pakistan[17]. Most studies conducted in Pakistan have only assessed physician's attitudes[18,19] and only one study has been carried out to evaluate improvement in EBM knowledge and skills amongst the physicians[20].

The aim and objective of this single center quasi-experimental study is primarily to determine the effectiveness of delivering a single workshop in evidence based medicine by comparing the pre and post workshop scores to ascertain level of knowledge and skills of formulating an answerable question and EBM literature searching skills among postgraduate medical trainees, undergraduate medical students, nursing students and student medical technicians.

Study Design

This study is a quasi-experimental study conducted at the PNS Shifa hospital, Pakistan Naval Medical Training School and Bahria University Medical and Dental College which are affiliated to PNS Shifa Karachi, Pakistan.

Settings and Inclusion Criteria of Participants

The study was conducted in the computer laboratory and learning resource centers in Pakistan Naval Medical Training School and PNS Shifa. Participants for the study consisted of four groups as follows:

A first group comprised of postgraduate trainees undergoing FCPS/MCPS training in different medical, surgical and allied departments.

Second group comprised of undergraduate third and fourth year students of Bahria University Medical and Dental College.

Third group comprised of first, second and third year nursing students undergoing nursing diploma at Pakistan Naval Medical Training School.

A fourth group comprised of students undergoing one year medical technician course at Pakistan Naval Medical Training School.

Recruitment

A preliminary introduction was given to different groups and then volunteers for the workshop were asked to inform the group leaders who later sent the list of participants to the authors.

Randomization and blinding were not applicable as there was no control group.

Intervention

Participants were exposed to EBM literature searching skills (EBM-LSS) workshop of three hours in four different groups. The EBM- LSS workshop consisted of: a pre-workshop evaluation of baseline concepts about EBM as per first two questions of Fresno test b) an interactive session on EBM process and how to construct an answered question c) an interactive session on how to search those questions on Pubmed d) brief discussion of the major sources of information and level of evidence and finally e) formal post workshop evaluation using first two questions of Fresno test in which 15-20 minutes were allocated.

Outcome Measures

The primary outcome to be measured in this study was competent in the first two steps of EBM comprising of formulation of answerable question and EBM literature searching skills. This was measured by using the first two questions of previously validated Fresno tool across all groups immediately before and after the workshop[5].

Secondary outcome was to compare the results of different student groups with comparable study groups of other similar studies which have used the Fresno test as an assessment tool.

Methods and Tools of Data Collection

A total of eight workshops (two for each group) on EBM literature searching skills devised on McMaster Style were delivered to target groups on a weekly basis. First two questions of Fresno test of competence of EBM were used for pre and post workshop evaluation. The maximum scores that could be achieved were 3 for the first question (writing a focused clinical question) and 6 for the second question (identifying information resources).

Limitations

In this study, only first two assessment questions of Fresno test have been used which test the first two steps of EBM. The subjects during the original validation of Fresno test did not include undergraduate medical students, nursing students and student medical technician. Only volunteers were included in the study and so sampling bias could not be removed. There is no control group in our study because in Pakistan EBM teaching has not been included in curricula at any level. The comparison between the groups of our study lacks validity due to different level of educational background. The comparison with study groups of Non Pakistani studies may lack validity due to baseline differences in knowledge, skills and basic education standards.

Methodological significance or innovation

In Pakistan, previously the Fresno test has not been tested on postgraduates, undergraduates or nursing students or student medical technicians.

Previously different groups of health professionals were never included in a single study.

The positive impact of three hour single EBM workshop on the learners without any previous EBM concept might encourage educationists to incorporate such short workshops in the medical curricula at different levels of healthcare professional training in Pakistan.

Analysis and Sample size calculation

The sample size was calculated in the light of a previous study which utilized the Fresno test to assess searching skills[5]. It was calculated that with a power of 80%, alpha set at 0.05, and a medium effect size (f2=0.15), a sample size of 92 was required to detect a significant model. Therefore, accounting for a potential 10% dropout rate, 102 participants were recruited for the study.

In our study the pre and post workshop scores of individual groups were compared for statistical significance.

The mean difference in the first two steps of EBM competency within the groups and between the different groups, as determined by the Fresno tool, were analyzed using a Student's t- test. Scoring analytical rubrics used were from previous studies[4,5].

Ethical approval

Ethical approval for this study was granted by the PNS SHIFA Human Research Ethics Committee in Feb 2012.

RESULTS

A total of 102 eligible candidates who volunteered were enrolled in the study. The distribution was 17(16.6%) postgraduates (PG) in

first group, 34 (33.4%) undergraduates (UG) in second group, 31(30.4%) nursing students (NS) in third group and 20(19.6%) medical technicians (MT) in fourth group. The percentage of volunteers out of the total eligible candidates in the respective categories was PGs 22.6%, UGs 22.6%, NSs 56.3% and MTs 36.36%.

Individual group percentage achieving overall scores above 50% is depicted in Table 1 which shows PGs on the top and NSs at the bottom. When the pre-workshop mean score was compared with a post workshop mean score within each separate group there was a statistically significant improvement as depicted in Table 2.For all groups the post workshop mean score of question 1 (formulating answerable question) was more than question 2 (EBM resources) and UGs achieved the highest scores in both questions.

Although the different groups are not comparable due to background education level, there was no statistically significant difference found when pre workshop total mean score of each group was compared with each other. The highest scores were of postgraduates followed by undergraduates and the medical technicians.

DISCUSSION

The difference in the number of participants in each group is because only volunteers in each category were included. The percentage of participation in the respective categories revealed lowest figures for the PGs and UGs. The possible reasons can be their hectic schedule or perception that the workshop will not help change their practice. The increased interest of the NSs and MTs can be their less busy clinical schedule and more enthusiasm to attend a workshop different from their routine lectures. However, to confirm the above speculations further study of knowledge and attitudes among these groups is needed. For all groups the cumulative mean score of question 1 (formulating answerable question) was more than question 2 (EBM resources) which can possibly be explained by the fact that they had no previous hands on experience of using the extensive EBM resources. Furthermore, main emphasis of the time limited workshop was to discuss the Pubmed and free resources available to the participants.

Our study indicates that delivery of single EBMLSS workshop to health professionals significantly improved participant's competency to carry out first two steps of EBM. The marked improvement of post workshop score in our study is primarily due to the fact that all the participants had barely any knowledge regarding EBM pre workshop. However, this improvement was only evaluated immediately post workshop and therefore, long term proficiency cannot be determined by this study. On the contrary, a

Table-1: Group percentage achieving overall scores above 50%.

Groups(n)	Achieving scores above 50%
Medical technicians(20)	40%
Nursing students(31)	29.03%
Undergraduates(34)	73.52%
Postgraduates(17)	82%

Table-2: Pre and post workshop scores comparison within the group.

Group	Mean Pre-workshop score	Mean Post-workshop score	*p*-value
Nursing Students	0.68	2.89	<0.05
Medical technicians	0.80	3.55	<0.05
Postgraduates	2.00	4.17	<0.05
Undergraduates	1.00	4.97	<0.05

recently published randomized Controlled Trial[4] carried out amongst third year MBBS students did not find any significant improvement in EBMLSS of participants. However, in this RCT pre-workshop assessment of EBM knowledge and skills was not conducted. Furthermore, EBM resource searching was not limited to Medline and was exhaustive across the appraised literature sources. The scores of our study groups in comparison to the study groups of this randomized controlled trial revealed that our study group of undergraduates scored higher in question 1 i.e. formulating an answered question than the RCT intervention and control group. In question 2 our UG scored higher than the RCT's intervention group but lower than the RCT's control group. The reason of the highest scores in our UG group in question 1 could be because more time was allocated to step one as well as more scenarios were discussed in the workshop for formulating an answered question. The lowest score for question 2 is due to limited discussion of the extensive EBM resources and more emphasis on free web resources as are available in our setup on line with few other studies[14,15].

Similar to the findings of our study, another study also provides evidence that a single brief training session can have marked beneficial effect on the short term EBMLSS[21]. In the literature there are many studies which have documented improved scores after series of workshops[14,15].

CONCLUSION

A high EBM competency level is expected of health professionals in the modern medical practice. However, out of the five EBM steps, a busy healthcare professional may only require to use already appraised information and may skip step 3 of the EBM process i.e. critical appraisal. Our study shows that a single EBM brief workshop has a statistically significant impact on the competence level of healthcare professionals in first two EBM steps and will assist educationists in the formulation and refinement of existing healthcare professionals' curricula within the EBM framework in Pakistan.

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