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Original Research Article

Effectiveness of an 'abridged course in medical education technology' based on students' evaluation of the teachers' performance

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ABSTRACT

Background: To sustain the standards of quality medical education, the faculty needs to be well trained in the medical education technologies, both traditional and innovative. Students are the real beneficiaries of all training programmes conducted for faculty development and they appreciate good teaching. Their involvement in all possible aspects of teaching and learning will go a long way in achieving the best outcomes. The objective of the study was to assess the effectiveness of an 'Abridged course in Medical Education Technology' for entry level teachers based on the students' evaluation of the (teaching) performance of the teachers.
Methods: An interventional study was carried out amongst 447 students, in which an educational intervention was done and the effectiveness of the 'Abridged course' was assessed. Teaching by the teacher trained through the 'Abridged course' formed the 'intervention' in the study. 'Evaluation of the teaching performance' by the students was the outcome studied.
Results: The performance of teacher as assessed by the students had a higher mean score (61.28, SD 9.8) for residents who underwent training in medical education technology, as compared to other residents (56.81, SD 9.2) with a p-value of <0.001.
Conclusions: This study highlights that an abridged course in teaching methodology for entry level medical teachers improves the quality of their teaching.

Keywords: Medical education technology, Abridged course, Effectiveness, Teachers' performance

INTRODUCTION

Faculty members of medical colleges play an important role in the training and instruction of future doctors and are expected to address a wide variety of educational goals. Due to the complexity of effective teaching, medical teachers need to be able to deploy many teaching skills. There is a growing consensus now on the fact that, to sustain the standards of quality medical education, the faculty needs to be well trained in the medical education technologies. Pre- service teachers' training routinely takes place in the general education sector in many countries. However this is not widely practiced in the field of medical education. World over, efforts are made to make teachers more efficient in their assignments by giving them various forms of training.[1]

To improve the quality of teaching, faculty development programmes exist in most educational institutions. More emphasis is now given to faculty development programs which include planned activities to enhance faculty members' teaching and education- research skills. The

minimum requirements laid down by the Medical Council of India (MCI) mandates every medical college in the country to have a Medical Education Unit (MEU) for faculty development and curriculum improvement.[2]

We have developed an eight hour 'Abridged course in Medical Education Technology' adapted from the curriculum of the basic course of the MCI, and customized it to meet our requirements, with an intention to impart to the entry level teachers the knowledge, attitudes and skills that they require to carry-out their routine teaching assignments. In an earlier study, we evaluated the programme in a faculty group and found that it was effective in improving their knowledge, motivation to teach and practice.[3]

Another important aspect of any educational program design is assessing program effectiveness. There are only a few published researches that demonstrate the effectiveness of such educational interventions.[4] The study have relied on indirect measures such as learner-satisfaction surveys or self-assessment by participants. Actual effectiveness of the training can be assessed only through studies on implementation of the learned concepts by the faculty and the impact of the same as gauged by students' learning. It is to be appreciated that students are the real beneficiaries of all training programmes conducted for faculty development.[5]

Hence the current study made an attempt to assess the effectiveness of an 'Abridged course in Medical education Technology' for entry level teachers, based on the students' evaluation of the (teaching) performance of their teachers.

METHODS

Study setting

A study was carried out in a private medical college in Kochi, Kerala which has undergraduate, post graduate and super specialty training with an annual intake of 100 MBBS students, 95 junior residents [those who join for their post graduate training (MD, or MS)] and 35 Senior residents [those who enrolled for super specialty training (DM, or MCH)].

Study design

An interventional study was carried out amongst 447 students during the period of April to October 2015, in which an educational intervention was done to assess the effectiveness of an abridged course. Teaching by the teacher trained through the abridged course formed the 'intervention' in the study. 'Evaluation of the teaching performance' by the students was the 'outcome' studied. Ethical clearance was obtained from the Institutional Ethics Committee.

Sample size and sampling technique

By convenient sampling method, six junior residents of community medicine were stratified according to their year of joining and were randomized into two groups. One group received an educational intervention and the other group served as control. We were included 3 residents who underwent training in Medical Education Technology and took class for 234 students and 3 untrained residents who took class for 213 students. Hence total sample size became 447.

Intervention

Step 1: A curriculum for an abridged course in Medical Education Technology was designed to impart to the residents the knowledge, attitudes and skills they require to carry-out their routine teaching assignments. The entire course duration was eight hours. The course content included Systems approach to medical education, Teaching-Learning process, Principles of Adult learning, Self- Regulated and Self-Directed learning, Taxonomy and domains of learning, writing Specific Learning Objectives, Microteaching, Curriculum, Interactive and Innovative teaching methods and teaching aids, Clinical teaching including bedside teaching etc. Three out of the six residents, received the training based on this curriculum.

Step 2: The residents who were trained undertook 234 student hours and the residents who were not trained 213 student hours of teaching respectively. The teaching sessions were of similar topics from the usually prescribed schedule of classes for undergraduate students of the department of Community Medicine in our institute. Thus the trained residents' classes constituted the intervention-limb of the experiment.

Evaluation: The impact of the course on teaching abilities was assessed using outcome levels defined by Kirkpatrick which included reaction, learning, behaviors and results.[6]

To evaluate the first level (K1) participants' responses regarding the impact of the training on them was evaluated using a researcher-administered feedback which captured qualitative descriptions of their reactions to the course. In the second level (K2), the learning of the participants' was evaluated. A pre-evaluation was done using a self administered questionnaire including closed and open-ended questions to assess the cognitive, affective and psycho-motor components of the Teaching-Learning process in medical education technology. A post- evaluation was done using the same questionnaire after one week of the completion of the training. The questionnaire was concurrently administered to both groups of residents and the results of this evaluation were compared.

In the third level (K3), the participants' behavioral changes (with reference to teaching) were measured. This was the objective of the present study. For this the "trained" and the "untrained" residents were given teaching assignments on similar topics to teach the same batch of MBBS students. The topics were allotted to residents by lottery method. Thereafter, students, who were blind on the intervention, were asked to evaluate the teaching of the individual residents, using a structured evaluation format at the end of each session. This format drew ideas from the standardized format used in micro-teaching exercises used by the Medical Council of India's Regional centres and others (this format was discussed with the faculty of our centre and accepted and consisted of 14 points which the student needed to rate on a Likert scale of 1-5). Thus the participants' teaching behaviour as evaluated by the under graduate students were compared with the control group residents.

The fourth level (K4) involves evaluation of the program's long-term impact on the learners' learning outcomes which will be the reflection of the results of the training. This evaluation was not one of our listed objectives (because data collection would be complex, time-consuming and costly). However a pre and post test (maximum 10 marks, multiple choice questions) to assess knowledge gain among students was conducted for each session, to study student's cognitive gain after the session. This took care of possible ethical issues also.

Data analysis

Data were entered into Excel sheet and analysed using Statistical Package for Social Sciences software for Microsoft Windows version 20. Pre-test and post-test scores of residents were described using mean and standard deviation. Scores were calculated for teaching merits of residents based on the responses from students and were compared using independent sample t- test. The students' pre and post-test scores were analysed to look for differences if any using paired sample t- test.

RESULTS

The K1 level evaluation was based on the participant feedback. The feedback given by the trained residents was very encouraging and positive. Participants who underwent the course were "impressed with the workshop" and expressed their "willingness to introduce and implement these methodologies in their day to day teaching/learning exercises."

Table 1: Performance of teachers as assessed by the students.

	Total no. of responses from the students who attended the class	Mean scores	Standard deviation	P value
Trained residents	234	61.28	9.8	<0.001
Untrained residents	213	56.81	9.2	

Table 2: Pre and post -test scores of students response.

	Number of students attended the class	Mean Scores	Standard Deviation	P value
Sessions by trained residents				
Pre-test	234	5.13	1.4	<0.001
Post-test		9.03	1.1	
Sessions by untrained residents				
Pre-test	213	3.19	1.5	<0.001
Post-test		7.35	1.8	

The comparison between the pre and post scores of the trained residents helped in assessing the K2 level. The mean knowledge score in teaching methods among junior residents prior to and after intervention was 2.33 (SD 0.57) and 8.67 (SD 4.16) in the intervention group while the figures were 2 (SD 1) and 1.67 (SD 0.57) for the control group respectively. The evaluation of K3 level was the objective of the current study. The performance of teacher as assessed by the students had a higher mean score (61.28, SD 9.8) for residents who underwent training in medical education technology, as compared to other residents (56.81, SD 9.2) with a p value of <0.001 (Table 1).

The pre and post-test scores obtained by students were compared using paired t test. There was statistically significant improvement in knowledge among students taught by both 'trained' and 'untrained' residents. The mean score difference in the pre and post test scores being 4.1 in the trained residents' classes and 3.76 in the untrained residents' sessions with a p value of <0.001 in both the groups (Table 2).

DISCUSSION

Our study supports the evidence that abridged courses in Medical education technology for faculty development enhances their teaching skills. Many previous studies that

were reviewed report similar outcomes as gains in knowledge, changes in attitudes, satisfaction with the program, and self-report of changes in behavior. However, many of these published studies lacked a control group.[7-10] Our findings are important because we have included a comparison group, and have evaluated the intervention from students' perspectives which will increase the validity and reliability of our findings. The results of a systematic review of 53 faculty development programs found that such programs resulted in high levels of satisfaction and changes in attitudes, knowledge, skills, and teacher behaviours.[11-13] The review also highlighted the fact that participants consistently found such programs acceptable, useful and relevant to their objectives. Participants who underwent our course also were "impressed with the workshop" and expressed their "willingness to introduce and implement these methodologies in their day to day teaching/learning exercises".

In the K2 dimension, the pre-test and post-test results showed that there were significant increases in participants' knowledge and noticeable differences between study and control group. These findings are also consistent with the findings of the systematic review. The elevated post-test marks among the entry level teachers signify the immediate effectiveness or usefulness of the training with regard to their learning.[14]

In the K3 dimension, we obtained students' evaluations of the trained teachers, and compared it with teachers who were not trained using the abridged course in Medical Education Technology. The results were positive and showed statistically significant improvements in formers' teaching skills, but no significant improvements in the latter's, as judged by the students. This result is evidence of the positive impact of the program on teacher- effectiveness as a result of changes in their teaching behavior/ performance. Positive changes observed by students in the intervention group is a major impetus to have a pre-induction faculty training program in medical colleges/ schools. Teachers who receive some form of systematic training definitely perform better and this is appreciated by the students. This can also catalyze changes that make them better learners. The improvement in teaching skills alone may not necessarily bring about immediate changes to student learning. While it is rational to believe that improving the pedagogic skills of (entry level and other) teachers promotes learning by medical students, there is only limited evidence suggesting that the effectiveness of teaching perceived by students can positively affect their performance and learning outcomes.[15]

Our study has shown an increase in knowledge gained by both group of students taught by 'trained' as well as the 'untrained' teachers. Many perceive medical students as persons with capacity to adapt and self-motivate, likely to possess the ability to achieve assessed learning outcomes, regardless of the teaching they receive**.** However we contend that organized training in medical education technology will make the teachers' roles more effective.

CONCLUSION

According to all the dimensions that we evaluated, the program had a positive impact on teaching abilities. Effect of randomization was uncertain due to the small numbers. Potential confounding factors need to be considered which could be intrinsic to student participants or extrinsic related to the resident teachers. Despite these limitations, the study findings are highly relevant. This study highlights that an abridged course in teaching methodology for entry level medical teachers improves the quality of their teaching. The changes in teaching behaviour have been appreciated by the students also. This in turn should help the student/ learner in achieving short and long-term goals. Directions for future research should include an understanding of how to accurately and reliably evaluate the result of the training as regards improved student learning i.e., the desired final outcome. We conclude that faculty development programmes will promote high quality of teaching and must be an essential activity of every medical school. Therefore designing formal approaches to achieve the goals in this area is recommended.

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