ORIGINAL ARTICLE

Role of Skill Laboratory Training in Medical Education - Students' Perspective

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ABSTRACT

Objective: To evaluate the perceptions of medical students regarding their training utilizing facilities provided in the skill laboratory of a public sector medical college.

Study Design: Cross-sectional study.

Place and Duration of Study: Army Medical College, Rawalpindi, from October to December 2014.

Methodology: Students of final year MBBS who had underwent skill laboratory training were recruited through convenience purposive sampling. Students not exposed to skill laboratory training were excluded. Data collection tool was a questionnaire having 23 questions with responses on Likert Scale as strongly disagree, disagree, agree and strongly agree coded as 1, 2, 3 and 4, respectively. Data was analysed on SPSS version 22.

Results: There were 78 (57%) male and 59 (43%) female students out of 137, with mean age of 22.59 ±0.74 years. The response rate was 68.5%. Cronbach's Alpha test was 0.84 showing high reliability. The mean of sum of all the 23 items was 63.85 ±8.71, whereas item means was 2.78 ±0.38, reflecting a high inclination of students towards skill laboratory training. Frequency of students responding in favour of skill laboratory training was significantly high ($p < 0.05$).

Conclusion: Medical students perceived skill laboratory training as a favoured learning strategy as compared to practising on real patients for acquisition of various aspects of clinical skills, knowledge and attitude.

Key Words: *Computer simulation education. Manikins. Patient simulation.*

INTRODUCTION

Learning clinical skills on 'real patients' not only jeopardizes patient's safety but also raises many ethical concerns. This necessitated the development of skill laboratories in medical colleges where students learn and practice various aspects of knowledge and skill imparting positive features that enhance the quality of the learning environment.[1-3]

Clinical skills acquisition is an important aspect and a bridge between gaining procedural knowledge and clinical competence.[4] Skill laboratories offer a 'mistake forgiving' training environment and studies have shown that such training improves procedural skills not only in novices but also in experts.[5] This applies to complex surgical skills as well as basic clinical skills performed by medical students. The skill laboratories help ensure all students acquire the necessary techniques and are properly assessed before practising on real patients.[6]

With the advancement of technology and healthcare facilities, patient care improved but some aspects of this improvement had a negative impact on training of medical students. For example, this led to dramatic reduction of inpatient beds, shorter hospital stay and the shift of care to ambulatory settings.[7] The problem is further aggravated by early student exposure to clinical skills and increasing number of medical students. Due to better healthcare facilities, patients admitted to hospitals are usually sicker and, therefore, unsuitable for bedside clinical skills training. In addition, there are concerns that bedside case presentation makes the patient uncomfortable.[8] All these factors have raised concerns about inadequacy in training of medical students because of altered clinical experience and the reduction in opportunities for acquiring clinical skills. Improved healthcare facility *per se* is a positive development and should be further strengthened. At the same time, measures need to be taken to counterbalance the negative impact on training of medical students. One of the solutions is development of skill laboratory which not only overcomes the existing problems but have also shown superiority in the training of medical students.[9]

Skill laboratories have been established in many medical colleges of the country and worldwide, but data regarding various aspects of training imparted through the skill laboratories is deficient.

The objective of the current study was to evaluate the perceptions of medical students about skill laboratory training.

METHODOLOGY

This cross-sectional descriptive study was conducted at Army Medical College, Rawalpindi, from October to

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Received: March 16, 2015; Accepted: November 26, 2015.

December 2014. The participants were recruited through convenience purposive sampling and included both the genders of all the categories of final year MBBS class that had underwent skill laboratory training. Medical students who were not exposed to skill laboratory training were excluded from the study. Participants were informed about the voluntary nature of the study and assured regarding confidentiality of their responses. The data collection tool was a closed-ended self-administered questionnaire having 23 questions as shown in Table I. It was distributed to the whole class of 200 students but only 137 returned the duly filled questionnaire. Sixty-three questionnaires were either not responded properly or returned blank, so these were discarded. The response of the items was measured on a four-point Likert scale as strongly disagree, disagree, agree and strongly agree.

Data was analyzed by using IBM SPSS Statistics version 22. Descriptive statistics were used to calculate mean and standard deviation for continuous variables, whereas frequency and percentage for the categorical variables. Four-point Likert scale was coded as 1, 2, 3, 4 for strongly disagree, disagree, agree and strongly agree, respectively. Difference between various levels of agreement of the questions was calculated by non-parametric chi-square test for goodness of test fit for single sample. Response rate was calculated in terms of percentage. Reliability of the instrument was determined through internal consistency by applying Cronbach's alpha test. The alpha value was set at 0.05 for significance. The data was presented as tables and graphs.

RESULTS

One hundred and thirty-seven students participated in the study at the response rate of 68.5%. There were 78 (57%) male and 59 (43%) female students with mean age of 22.59 ±0.74 years. Reliability of the questionnaire (Cronbach's Alpha) was 0.84, showing high reliability. Out of the total 3151 responses, 421 (13.4%) strongly disagreed, 441 (14.0%) disagreed, 1712 (54.3%) agreed and 577 (18.3%) were strongly agreed. Difference among frequencies of students responding for various levels of agreement was statistically significant ($p < 0.001$).

Frequency and percentage of the respondents for various levels of agreement is shown in Table I along with mean and standard deviation for each item. Mean of sum of all the 23 items (scale statistics) was 63.85 ±8.71, whereas item means for the questionnaire (summary item statistics) was 2.78 ±0.38. Difference among various levels of agreement of all the questions was statistically significant ($p < 0.05$).

DISCUSSION

This study evaluated the perceptions of final year medical students towards skill laboratory training. About 84% to 89% students opined that skill laboratory training increased motivation for becoming doctor and

Table I: Frequency of students responding to different questions and comparison of various levels of responses.

Questions	Level of agreement				Mean	SD	p-value
	Strongly disagree (1)	Disagree (2)	Agree (3)	Strongly agree (4)			
Training increased my motivation for becoming a doctor	3 (2.2%)	12 (8.8%)	95 (69.3%)	27 (19.7%)	3.07	0.60	< 0.001
Training increased my motivation for learning clinical subjects	3 (2.2%)	12 (8.8%)	92 (67.2%)	30 (21.9%)	3.09	0.62	< 0.001
Teachers in the skills laboratory were committed to teaching	4 (2.9%)	6 (4.4%)	105 (76.6%)	22 (16.1%)	3.06	0.57	< 0.001
Teachers demonstrated the skills for me so that I understood what to do	5 (3.6%)	6 (4.4%)	106 (77.4%)	20 (14.6%)	3.03	0.58	< 0.001
Teachers observed if I learned what I was supposed to learn	22 (16.1%)	28 (20.4%)	71 (51.8%)	16 (11.7%)	2.59	0.89	< 0.001
I had to participate actively in class	18 (13.1%)	20 (14.6%)	82 (59.9%)	17 (12.4%)	2.72	0.85	< 0.001
I tried all stations in the skill lab that I participated in	22 (16.1%)	17 (12.4%)	80 (58.4%)	18 (13.1%)	2.69	0.89	< 0.001
I have developed professional approach in the skill lab	48 (35.0%)	24 (17.5%)	53 (38.7%)	12 (8.8%)	2.21	1.02	< 0.001
There was too much noise in the skills laboratory	45 (32.8%)	37 (27.0%)	41 (29.9%)	14 (10.2%)	2.18	1.0	0.001
There were too many students in the skills laboratory at the same time	37 (27.0%)	34 (24.8%)	46 (33.6%)	20 (14.6%)	2.36	1.03	0.017
It was hard to concentrate in the skills laboratory	46 (33.6%)	38 (27.7%)	38 (27.7%)	15 (10.9%)	2.16	1.01	< 0.001
I have benefitted from the training of skills	5 (3.6%)	7 (5.1%)	104 (75.9%)	21 (15.3%)	3.03	0.59	< 0.001
I believe I could have learned the same skills just during house job as well	16 (11.7%)	25 (18.2%)	78 (56.9%)	18 (13.1%)	2.72	0.84	< 0.001
I was not under pressure any time when performing clinical skills	26 (19.0%)	26 (19.0%)	69 (50.4%)	16 (11.7%)	2.55	0.93	< 0.001
Teachers went through the procedure with me before I had to perform it myself	15 (10.9%)	7 (5.1%)	92 (67.2%)	23 (16.8%)	2.90	0.80	< 0.001
I did not have to be afraid that I would do something wrong	16 (11.7%)	18 (13.1%)	84 (61.3%)	19 (13.9%)	2.77	0.83	< 0.001
I did not have to be afraid that I would hurt the patient	16 (11.7%)	20 (14.6%)	80 (58.4%)	21 (15.3%)	2.77	0.85	< 0.001
Skills learned on a manikin can be directly transferred to patients	13 (9.5%)	17 (12.4%)	84 (61.3%)	23 (16.8%)	2.85	0.80	< 0.001
There is no difference in learning skills on a manikin and on a patient	41 (29.9%)	62 (45.3%)	29 (21.2%)	5 (3.6%)	1.99	0.81	< 0.001
Skills laboratory training has increased my confidence	2 (1.5%)	8 (5.8%)	91 (66.4%)	36 (26.3%)	3.18	0.59	< 0.001
Confidence is important for me when I perform clinical skills	5 (3.6%)	3 (3.6%)	59 (43.1%)	70 (51.1%)	3.42	0.71	< 0.001
Skills lab training has increased my outcome of the house job	8 (5.8%)	7 (5.1%)	89 (65.0%)	33 (24.1%)	3.07	0.72	< 0.001
House job provides a better opportunity to learn clinical skills as compared to the skills laboratory	5 (3.6%)	7 (5.1%)	44 (32.1%)	81 (59.1%)	3.47	0.76	< 0.001

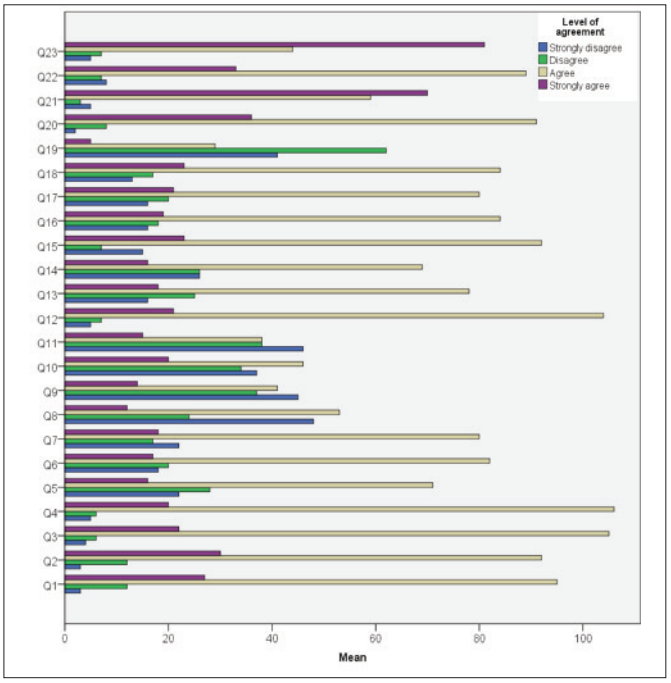

Figure 1: Comparison of students' responses to various items of questionnaire.

developed interest in learning clinical skills. Ninety-one percent students agreed that they benefitted from skill laboratory training and about 62% responded that they had no time pressure while performing clinical skills in skill laboratory. Learning is enhanced in a secure environment when students feel that they would not hurt the patient or do something wrong while performing clinical skills. The results of this study show that 70% to 75% students felt secure of not doing something wrong or hurting the patient while learning clinical skills on manikins in skill laboratory. About 93% students responded that skill laboratory training enhanced their confidence and majorities were of the view that confidence plays a major role in learning clinical skills. An overall significantly higher frequency of students were in favour of skill laboratory training due to multiple advantages that skill laboratory training offers for the learning of clinical skills.

The results of this study are supported by the work done by Soliman *et al*. to determine the perception of undergraduate medical students about skill laboratory training at King Saud University Medical College, Riyadh, Saudi Arabia.[10] They reported that about 82% of their study population responded that clinical skills can be learnt better in skills laboratory before dealing with real patients. Similarly, a study to find out the impact of skill on learning of clinical skills in preclinical years was conducted by Ali and colleagues.[11] They recruited 150 students of pre-clinical years and found that training in clinical skill laboratory significantly improved the performance of students and understanding of basic subjects. They further reported that apart from clinical skills, other attributes, like communication skills, are developed through skill laboratory training.

Smyrnakis *et al*. conducted a study on 132 students to determine response of students to skill laboratory training.[12] They reported that 87% of their study population was satisfied with skill laboratory training and 86% stated that they would like to attend the skill laboratory sessions again. Overall, on a scale of 0 - 10, their clinical skill laboratory scored 9.13% showing high tendency of students towards skill laboratory training. Strand *et al*. performed a study to investigate how skill laboratory training enhances students' learning.[13] They noted that the feeling of security is the main factor that enhances learning along with team work, psychomotor involvement and having a "modern-minded" teacher. They emphasized that majority of their respondents stated that the feeling "if something went wrong, nothing would happen" made them fear-free, secure and confident, which provided them the impetus to learn clinical skills. They argued that such 'fear-free' learning environment cannot be made available to students in wards on real patients. Better patient outcomes, linked directly to simulation-based medical education, have been reported in several studies using historical control groups that address reductions in catheter-related bloodstream infections,[14] and postpartum outcomes (e.g., brachial palsy injury).[15] Such work suggests that traditional clinical education is inadequate if the goal is skill acquisition and patient safety.

Skill laboratories have an essential role in medical education today. The purpose of skill laboratories is to support the acquisition of the clinical skills through hands-on training, within non-threatening environment. The skill laboratory training ensures that all the students are provided equal learning opportunities before approaching the real patient. Response of today's medical students, who are 'technology-enabled' and computer literate, is very encouraging towards training in skill laboratory. Students start going to the skill laboratory right from first year to learn the application of theoretical knowledge of basic sciences, which they are taught in lectures. A clinical skills laboratory should be utilized by the undergraduate and postgraduate students to learn not only professional skills, but it should be part of medical education to achieve continuing professional development.

CONCLUSION

Medical students perceived skill laboratory training, a favoured learning strategy as compared to practising on real patients for acquisition of clinical skills, knowledge and attitude. All the stake-holders need to give due attention to this important 'technological advancement' for improvement of medical education in their own teaching and learning environment and the country as a whole.

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