Original Article

Clinical Training

"Choosing the Best Modality for Undergraduate Clinical Training" A Mixed Method Approach

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ABSTRACT

Objective: To compare the effectiveness of clinical skills training of undergraduate students who have undergone three different modalities of training consisting of real patients, mannequins/simulations and combination of both by summative assessment.

Study Design: Descriptive and comparative study

Place and Duration of Study: This study was conducted at Foundation University Medical College Islamabad for eight months.

Materials and Methods: The study was conducted on undergraduate medical students during gastrointestinal tract (GIT) and Renal modules in year two. Clinical skills techniques of 100 students were examined during an objective structured clinical examination (OSCE). The examination was carried out using real patients, simulated/mannequins and combination of both techniques on Group A (batch 2011), Group B (batch 2012) and Group C (batch 2013) respectively. Total number of stations was ten and examiner rated students independently on clinical skill techniques.

Results: Descriptive and comparative statistics for student scores were compiled from the OSCE forms used at the stations. Measures of central tendency, mean and standard deviation were calculated for ten OSCE stations as well as an overall score. Inter-rater reliability between student scores ranged from 0.84-0.89 for the different modalities. There was a significant difference in the performance of group A (real Patients) and group B (Simulated patients) from group C (mixed technique) at all stations and p value 0.05 was considered significant .

Conclusion: Significant improvement was noted in the clinical skill techniques of undergraduate students who were trained through mixed method approach as compared to the individual methods.

Key Words; Clinical Skills Laboratories, Centers, simulations, mannequins, OSCE

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INTRODUCTION

Medical education has traditionally relied on training with real patients in actual clinical settings where hands-on, experiential learning is indispensable, while medical educators are increasingly concerned about and committed to the safety of patients[1].

With the increasing advancement in technology, the hospital stay of patient has been reduced leading to dearth of patient available for clinical training. Similarly patient may refuse to be examined by a trainee physician due to increased awareness of patients' rights. There is evidence that all these factors lead to non fulfillment of physicians' training needs thus resulting in poor performance of graduating doctors.[2]

The training needs of undergraduates and postgraduate students are now being fulfilled through the establishment of clinical skill facilities and the use of simulation. Clinical skills facility provides specialist expertise for all those who deliver healthcare services to patient and communities.[3] The clinical skills centre can be defined in terms of facilities, specialist equipment & specialist tutors.[4]

Simulation is a powerful learning tool which is often used to support teaching in clinical centre. Simulation can be a person, a device or set of conditions that tries to present patient problems authentically ,the learner is required to respond to the problem as he or she would under natural circumstances[5].Many studies have shown that simulation is a valuable educational tool in undergraduate medical education. Simulation has been used as an evaluation tool to assess knowledge gaps in medical students and residents in the management of acutely ill patients[6]. Interactions with simulated patients /mannequins can meet the specific educational goals. Simulation is an educational technique that allows interactive activity by recreating all or part of a clinical experience without exposing patients to the related risks.[7]The simulation based clinical skills training boost the confidence of undergraduate students as compare to

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real patients who at times are not in such a condition to allow the students for examination.[8]

The integrated modular teaching program was implemented at Foundation University Medical College (FUMC) in year 2009.In the earlier years of implementation this new program, the undergraduate students of year 1&2 were visiting the hospital wards for the clinical skills training on real patients. In year 2012, after establishment of clinical skill lab at FUMC the clinical skills training of students was carried out on mannequins and simulated patients.

In this study a mixed method approach has been introduced for clinical skills training .The students are trained on simulation initially and then the same experience is repeated on real patients.

The objective of study was to evaluate the difference in the performance of three groups of second year students undergone three different methods of training ,the group A trained on real patients, group B trained on simulation and Group C trained on both modalities.

It was expected that study will explore a more effective method of clinical skills training of medical students during the preclinical years at Foundation University Medical College.

MATERIALS AND METHODS

The study was of eight months duration, conducted during two modules for year two undergraduate students. Each module was of five weeks duration. Students were trained on history taking, general physical examination, systemic examination and communication skills.

Total number of participants was 320, consisting of 100 students of year two from session 2011 trained on real patients , 118 students of year two from session 2012 trained on manikins and 102 students of year two from session 2013 trained on both manikins and real patients .

Clinical skills techniques of students were examined during an objective structured clinical examination (OSCE). Total number of stations was ten and consisted of history taking, physical examination and communication skills stations. The Instrument used was Objective Structured clinical examination (OSCE) form.

Each examiner rated the students independently using OSCE form on each station. Each station was of seven minutes duration .Approval from ethical review committee of Foundation University Medical College was acquired. All the students attending the sessions were included in the study except for the students who had less than 80% attendance . Results were analyzed using SPSS -16. Descriptive and comparative statistics were compiled from the data gathered from OSCE forms used at the stations. Measures of central tendency, mean and standard deviation were calculated for each OSCE station as well as for overall score.

An independent sample t test was conducted to evaluate differences in student scores. The p-value less than 0.05 was considered statistically significant. Comparison between Group Scores (A, B and C) were performed by ANOVA (analysis of variance).

RESULTS

Descriptive and comparative statistics for student group scores were compiled from the OSCE forms used at the stations. Measures of central tendency mean and standard deviation were calculated for ten OSCE stations as well as an overall score. The Groups means ± SD with range were: 38±5 (24-47), 42±9 (11-60) and 81±8 (70-95) Group A, Group B and Group C respectively. Inter-rater reliability between student scores ranged from 0.84-0.89 for the different modalities. An independent sample t test was conducted to evaluate differences in student scores. There was a significant difference between the group A (real Patients) and group C (mixed technique) with *p value* 0.001as shown in table-1 , and again significant difference was noted between group B (Simulated patients) with Group C (mixed technique) at stations (p=0.001) as shown in table -2. Analysis of variance also showed a difference in OSCE scores between the groups (p=0.001).

Table 1: Graphical representation of students' scores in groups

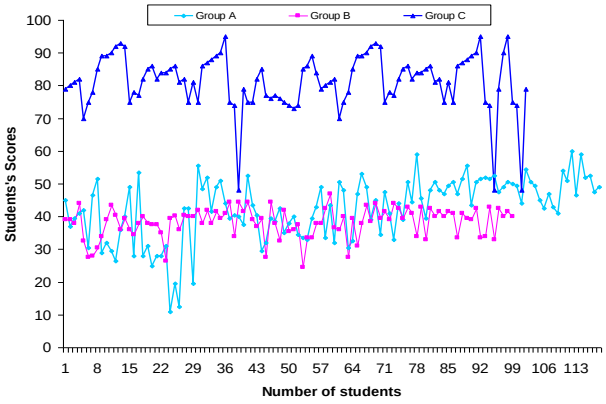

Table No.2: Descriptive and Comparative Statistics among Groups A& C

Groups (Scores)	N	Range	Mean ± S.D	*p*-value
Group A	100	24 - 47	38±5	**0.001***
Group C	102	45 - 80	68±1	

Table No.3: Descriptive and Comparative Statistics among Groups B&C

Groups (Scores)	N	Range	Mean ± S.D	*p*-value
Group B	118	11-60	42±9	
Group C	102	45 - 80	68±1	**0.001***

The analysis of variance also gave the significant result between groups (p=0.05) .Inter-rater reliability between student scores ranged from 0.84-0.89.

DISCUSSION

In this study three different modalities of clinical skills training are used for three groups of undergraduate medical students. The results show improved scores of students undergone a mixed method approach using both simulation and real patients for training when compared with other two groups. There was significant difference in the performance among three groups of students

The undergraduate students of group A were trained on traditional bedside teaching method. In the traditional method ,the clinical skills training depends upon the availability of patients during the sessions, which results in varied experience among student though they belong to same cohort [9]. In addition, the increased awareness of patients' rights and changing expectations of society has gradually made traditional bedside teaching inadequate for physicians training needs. This type of opportunistic training could be one of the reasons of an average performance of group A students in this study.

The performance of students of group B trained on simulation in the clinical skills lab was found better compared to group A .The previous section has discussed many possible reasons for the difference in performance among the two groups including the increasing number of students, decreasing availability of patient for bedside teaching[10].Similar factors have highlighted the importance of use of simulators which appeared in anesthesia as one of the first places in medicine [11,12]. Simulations have been used for many different purposes, from skills training to decision making, from individual to group training [13].Simulation technology has begun to gain widespread acceptance in medical education because of the safety of the environment, the ability to demonstrate multiple patient problems, the reproducibility of content, and the ease of simulating critical event. The ability to provide immediate directed feedback is the primary advantage of simulation. This opportunity is typically lacking in the clinical setting. It also effectively addresses the diversity of both learners and situations with its adaptable, programmable structure. The main limitation of simulation is learner-dependent, as it requires full participation and engagement by the individual.[14]

Introduction of simulation does not mean the replacement of training in clinical wards but to augment it . It is important to transfer this training on simulation to real life experience. In one of the study poor correlation has been reported between skills lab and real patients performance of students.[15]

In the present study the third group of students (group C) was trained on both simulation and then on real patients and it showed better performance compared with first and second group. The results of the study are comparable to another study according to which the effectiveness of training program is in doubt when the element of transfer of knowledge has not been incorporated in it. [16]

Students may have problems transferring the skills they learned in clinical skills lab .Clinical skill lab training is ultimately challenged by the degree of transfer of skills to patient care . One of the study shows a positive correlation between skills training and outcome but few have also shown that during clerkship students do not find it easy to apply skills on actual patients which they have learnt in clinical skills laboratory. Few of the reasons for which could be the change of context and unpredictable responses by patients. To avoid such deficiencies the early clinical exposure sessions can be positioned in the clinical setting to make the experience more realistic.[17, 18, 19]

According to Kolb's cycle the learning must start with concrete experience, that is learner being immersed in the experience not only by simulation but also with real patient interaction .This method can address not only the issue of fragmentation of training but will reduce the gap between the two experiences and delay of learning.[20] In the present study , students showed increased motivation to learning clinical skill with the addition of real life experience to the training sessions. There was improvement in the clinical skills of undergraduate students who were trained on both simulation as well as real patient compared to the individual methods of training.

CONCLUSION

It can be concluded that significant improvement can be achieved in the clinical skill techniques of undergraduate students by the use of mixed method approach consisting of simulation and real patients compared to the individual methods of training .By combing both methodology at preclinical year we shall be able to take care the issues of patient safety, transfer of skills and contextualization of experience for student training. This study was limited by being a single-center study with limited number of participants.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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