Original Article

Clinical Skills in Undergraduate Program and Curricular Change – Does it make a Difference?

Naushaba Sadiq [1], Syeda Kauser Ali [2], Lubna Meraj[3], Sadia Chaudhry [4] Fauzia Abdus Samad [5]

[1] *Department of Medical Education, Foundation University Medical College*
[2] *Institute of Medical Education, Jinnah Sindh Medical University*
[3] *Department of Medicine, Rawalpindi Medical University*
[4] *Department of ENT, Rawalpindi Medical University*
[5] *Department of Medicine, Foundation University Medical College*

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Corresponding Author
Dr Naushaba Sadiq,
Email: naushabasadqi@yahoo.com

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Abstract

Background: Clinical Skills Laboratory (CSL) was established at Foundation University Medical College (FUMC) in year 2009 with the introduction of integrated modular teaching program. A structured integrated curriculum was introduced from the Class of year 2013 for learning of clinical skills at CSL. This study was conducted to evaluate the effect of introducing the new curriculum on student's performance in CSL.

Methods: A comparative analytical study was conducted. The OSCE scores of group A (Class of year 2011) were compared with group B (Class of 2013). Data collection tool was institutional checklist. The OSCE stations were of General Physical Examination (GPE), history taking, systemic examination of Gastrointestinal tract and communication skills.

Reliability of the scores was estimated through Cronbach α. Mean scores of the two groups were compared using the independent sample t test and Mann Whitney U-test. Chi-square test was used to compare variables (years, gender and educational background). Comparison of student scores at different components of OSCE using Analysis of Variance (ANOVA) was done.

Results: Reliability of scores was 0.65 for group B and 0.52 for group A. comparison of overall scores of the two groups reflected improved performance in the group B (p 0.001). Comparison of scores at different components of OSCE using ANOVA also reflected better performance of group B ($p<0.01$). OSCE scores of both the groups were also correlated for gender and educational background. No difference was found in the two groups on the basis of gender and educational background.

Conclusion: To enhance the value of clinical skills training and to make it more effective, skill lab curriculum must be structured and integrated within the undergraduate curriculum.

Key words; Clinical Skills Laboratory, Undergraduate Integrated Curriculum, Clinical Skills Training.

Introduction

Clinical competence of a medical doctor is reliant upon the quality of hospital based training and patient interaction during the medical school [1, 2]The advancement in biomedical sciences, reduced hospital stay and increasing awareness of patient has led to less availability of patients for training purposes.[3,4]

The growing expectation of society from medical education and health care system has resulted in a change in curriculum design and content all over the world. Most of the medical colleges have shifted from traditional subject based to integrated system based curriculum,[5]which focuses on integrated teaching, critical thinking, self-directed learning, communication skills and professionalism to help the graduating physicians in attaining the competencies described by medical regulatory bodies . [9, 10, 11.]

New integrated modular teaching program calls for the demanding tasks of educational research, leadership and centralization of administrative tasks[12].It also requires multidisciplinary curricular teams to improve communication between basic and clinical faculties and relevance of integration of basic and clinical sciences subjects in teaching and learning at medical school[9,13,14] .

The integrated modular program has proven to enhance the student's clinical skills through small group teaching activities and early clinical exposure[15].In Australia and UK, integrated medical education implemented with early clinical exposure and basic science teaching till year 4 has provided evidence of effectivness.[16, 17,19]

One of the study conducted at European medical schools, which showed unsatisfactory performance of students in OSCE has indicated the need for the revision of curricula with special attention to clinical skills training[6].The teachers attached at clinical skill centre should have expertise in communication skills, use of simulation and small group teaching[19].Clinical skills Laboratory (CSL) is a requirement of 21st century for training and continuous professional development of healthcare practitioners[20].

In Pakistan, current system of undergraduate medical education in majority of medical colleges is discipline/subject based except few of the medical colleges where integrated modular teaching program has been implemented [21].

In year 2009, integrated modular teaching program was introduced at Foundation University Medical College (FUMC) and CSL was established like many medical schools[22].In CSL, clinical skills training, use of manikins, standardized patient and hands on practice of skills were introduced from year one.

Faculty development was one of the challenge faced by FUMC during the implementation of integrated modular teaching program and in early years of implementation, clinical faculty was attached to CSL for skills training of year 1& 2 medical students .It was expected from the clinical faculty to train the students in the skills which were relevant to the module being run i.e. in respiratory module , history taking and examination pertaining to respiratory symptoms , keeping in view the level of students and avoiding too much details regarding disease process. The faculty having no experience of skills laboratory teaching and training methodology was in a habit of delivering lecture instead of focusing on skills training and was unable to teach at the level of the students. Hence unstructured curricula having "no written" outcome, objectives and content for CSL training and untrained faculty led to varying experiences on part of students. A need of integrated structured curriculum for CSL was realized and an "integrated structured curriculum" was developed and implemented in the year 2013.

After the implementation of new curriculum, end of modules OSCE was conducted to evaluate the performance of student. The aim of the study was to compare the performance of students undergone integrated structured curriculum with the performance of students undergone unstructured curriculum.

Patients and Methods

The study was conducted at Foundation University Medical College Islamabad on Year -2 students from two different sessions . There were 100 students in group A, undergone unstructured curricular experience and group B had 150 students who underwent structured curriculum. Students having less than 80% attendance were excluded from the study as they were ineligible to appear in OSCE due to poor attendance .

It was a Comparative Analytical study. The OSCE scores of group A, undergone unstructured curriculum were compared with group B undergone structured curriculum. Data collection tool was institutional checklist. The OSCE stations were of general physical examination (GPE), history taking, systemic examination, and communication skills. The OSCE was held at the End of Block examination, it

was a summative examination . It included the content from Gastrointestinal and renal modules.

Students were divided in five subgroups with thirty students in each batch per day. Similar checklists as that of previous year were used to assess the students. The results were analyzed for individual stations as well as for total scores. The pass percentage was 50% for overall examination. Examiners were of same qualification as that of previous year and had not gone through any additional faculty development program. The exam was summative and was conducted in same setting as that of previous year.

For statistical analysis SPSS version 16 was employed. The *p* value less than 0.05 was considered significant for this study. Mean, standard deviation, frequencies and percentage of all categorical variables and continuous variables were calculated for both the groups.

The reliability of the scores was estimated through Cronbach α. Mean scores of the two groups were compared using the independent sample t test and Mann Whitney U-test. Chi-square test was used to compare variables (years, gender, results and educational background). Comparison of student scores at different components of OSCE using Analysis of Variance (ANOVA) was done. Informed consent was obtained from the participants and data was kept confidential. The ethical review committee approval was also obtained .

Result

The total number of students in both the years were 220.Out of 220, 89% students were from Higher Secondary School Certification Faculty in Science (F. Sc.**),** 11% were from General Cambridge Examination advanced level (A-level). Gender analysis showed that 76% were females and 24 % were males.

The results of objective structured clinical examination were analyzed for both groups undergone unstructured and structured curriculum. The reliability of scores was 0.65 for group B and 0.52for group A.

The chi square test was used for the comparison of gender, educational background and students' results among the two years. The cross tabulation of years with gender and students' educational background showed insignificant results with *p*-value 0.365 and 0.845 respectively. While the comparison of results for both groups showed significant difference with p value =0.001. The maximum number of students (116) passed from group B (year 2013) with 91%, as shown in table 1.

TABLE 1 : Comparison of Students Results at Different Stations of Year 2011 and 2013 (n=220)

Stations	**Mean ± S.D Marks/Station**		***p*-value**
	2011 (n=92)	**2013 (n=128)**	
Station 1 GPE	5.01 ± 1.3	4.39 ± 2.7	0.049*
Station 2 GPE	5.16 ± 0.89	6.2 ± 1.7	0.001*
Station 3 GPE	4.99 ± 1.7	6.1 ± 1.9	0.001*
Station 4 History	4.57 ± 1.1	6.37 ± 1.48	0.001*
Station 5 History	4.34 ± 1.4	6.67 ± 1.4	0.001*
Station 6 Examination	4.49 ± 0.98	5.14 ± 3.4	0.075
Station 7 Examination	5.16 ± 1.2	6.93± 1.4	0.001*
Station 8 Examination	4.58± 0.96	6.59± 2.1	0.001*
Station 9 Communication	5.17± 0.89	7.65± 3.1	0.001*
Station 10 Communication	4.92± 0.92	6.68± 3.48	0.001*
Total Marks	48.32 ± 5.01	62.82 ± 10.74	0.001*

In table I; the distribution of student's scores at different stations in group A (year 2011)and group B (year 2013)showed significant difference at all stations except examination station number 1 &6. Station number I was of general physical examination and number 6 was of systemic examination. The highest mean difference was found at communication skills station (number 9) with (*p*= 0.001).

In table 11, the distribution of student's scores at different stations in group A and group B showed significant difference at all stations except examination station number 1 &6. Station number I was of GPE and number 6 was of systemic examination. The highest mean difference was found at communication skills station with p value 0.001.

The comparison of various components (GPE, history, systemic examination and communication skills) of examination by ANOVA test also reflected significant difference between groups (p<0.01).

TABLE 2 **:** Comparison among Demographical Factors of Students of Year 2011 and 2013 (n=220)

Characteristics	**Years 2011 (n=92) n (%)**	**2013 (n=128) n (%)**	*p*-value
Gender			
Male	25 (27)	28 (22)	0.365
Female	67(73)	100(78)	

Educational Background			
F.Sc	82 (89)	113 (88)	0.845
A-Level	10 (11)	15 (12)	
OSCE Results			
Pass	48 (52)	116(91)	0.001*
Fail	44 (48)	12(09)	

The comparison of student scores with gender distribution within each group (A &B) and comparison of Students Results VS Educational Background of group A&B by Mann Whitney U-test showed no significant difference. There was noteworthy difference among mean score of group A and group B at various stations (p value =0.001) with maximum mean score (7.65) of group B at communication skills station.

Discussion

Clinical skill laboratories are established at medical schools as part of integrated modular teaching program. Training of history taking, examination and communication skills in small groups with hands on practice are the distinguishing characteristics of these skill laboratories.

The present study was conducted after the implementation of structured curriculum in clinical skills laboratory at FUMC.

The OSCE scores of group B were compared with the OSCE scores of group A and it was found that group B performed better than the group A on almost all components of the end of module OSCE. The individual group analysis showed improved results of group B with pass percentage of 91%.

The demographic characteristics of two groups of students for gender showed almost similar number of male and female students in both the groups (73% &78% females in group A &B respectively). The knowledge of gender distribution is important because of difference in study preference among the two genders [5]. Such preferences have long-term consequences on higher studies, limiting the number of male and female students in certain fields[23].This comparison concluded that there was no difference in gender distribution in both the groups and had no contribution towards the results of this study.

Educational background was also considered of two groups under study as in Pakistan students enter medical schools after going through two different systems of education i.e. F.Sc and A -level .Both systems have their own style of teaching and learning. Feedback from medical school faculty describes that one group of students out of the two categories shows more inquisitive, expressive, and creative behaviour. Evidence suggests that fulfilment of learning needs during early school life has a positive impact on advanced studies of students [24]. The comparison of educational background against scores in this study reflected no significant difference in students' scores within the groups due to their educational background (p value 0.697 &0.734 for groups A & B respectively).

The factors related to OSCE examination which might have affected the students' scores include number of stations which were same for both the years. Studies in the domain of assessment show that number of stations have an impact on reliability of examination, reliability of scores increases with increase in the number of stations [25].Similar checklists were used for both years to ensure objectivity of results as checklist provide a systematic way of collecting data and use specific criteria for making judgment about students' performance[26]. The teachers' qualification can influence the achievement of learning outcome[27, 28]. In present study the level of faculty qualification for both the groups was same.

OSCE had stations on history taking, communication skills, GPE & systemic examination. The students of group B, undergone structured curriculum scored better than students of group A, undergone unstructured curriculum. Similar result in support of integrated structured teaching was found in a study, where students' mean scores in the post-test was significantly higher than pre-test and students felt more confident during their clinical rotations[29].

The analysis of individual station OSCE scores for both the groups showed significant difference among the groups with group B performing better than group A . The mean scores of individual station also supported overall mean scores and overall percentage of pass and fail. However, for the station of systematic examination, there is not much difference in the results of the both groups. Similarly for station of general physical examination, the group A score was higher compared to group B which could not be explained by any reason. The overall pass percentage for group B was much higher (91%) compared to group A.

The above discussion suggests that almost all the factors for both the groups under study were same except for the structured integrated curriculum of session 2013 for group B. So we can conclude that structured clinical skills laboratory curriculum

resulted in better performance of students during the end of module examination.

A study was conducted to evaluate the impact of a structured clinical skills laboratory curriculum on surgery residents' intra-operative decision-making and technical skills and it was found that examination scores improved after implementation of integrated structured curriculum[30].

Structured curriculum has been increasingly used in numerous disciplines of health profession and curriculum development has been identified as first step while establishing any clinical skills laboratory. There is dire need for increased and systematic attention to undergraduate skills training and assessment[9].

It can be concluded that structured integrated curriculum must be recognized as an important factor for effective clinical skills training. Increasing accountability for acquiring competencies in medical education has also highlighted importance of structured curriculum. Structured curriculum provides criteria for performance evaluation and quality assurance. The integrated structured skill lab curriculum is more applicable and engaging for students.[31]

Clinical skills laboratory addresses the issue of non-availability of patients, equal training opportunities and clinical skills training in earlier years. The aim of skill lab is not to replace the clinical skill training but to support and enhance the existing training program by providing safe environment to perform skills before entering clinics.

This study is not without limitations. These include less number of modules under study, conduction of study at one institution. The possibility of extending the study to larger number of students in more than one institution and evaluation of transfer of clinical skills from lab to clinical setting can be a future direction of study.

This study is of value for institutions which are in the process of implementing integrated modular teaching program, where clinical skills lab is established as an allied facility and little attention is paid towards curriculum and faculty development for skills lab which results in non-serious attitude of faculty and students towards skills training in earlier year.

Conclusion

To enhance the value of clinical skills training and to make it more effective, skill lab curriculum must be structured and integrated within the undergraduate curriculum.

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