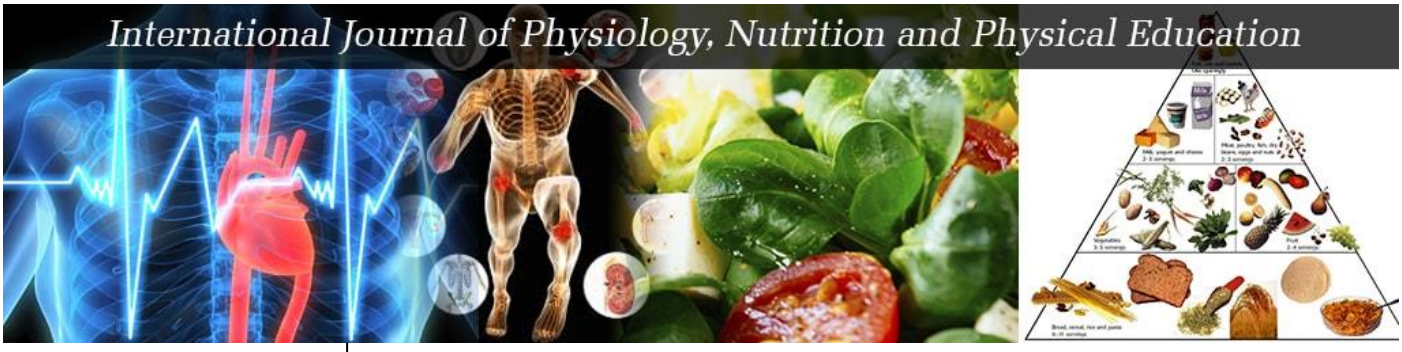

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Obesity and over-weight-early clinical exposure for first-year MBBS students

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Abstract
This comparative, before-and-after type of study was conducted on 79 first-MBBS students (31 females; 39.24% and 48 males; 60.76%) in Western India to study the difference in scores after traditional didactic lectures (by a pre-test) and after integrated teaching with early clinical exposure (by a post-test). After clarifying the purpose of the study and obtaining written informed consent, traditional didactic lectures were delivered as per syllabus for the first-year MBBS course. Subsequently, a pre-test that comprised ten questions (two marks per question; total 20 marks) was administered. After the pre-test, integrated teaching with early clinical exposure was conducted on the same topic. This was followed by a post-test that used a questionnaire that was identical to that of the pre-test. The differences between the pre- and post-test scores were highly significant for both females (p<0.0001) and males (p<0.0001). Highly significant gender differences in scores were observed both in the pre-test (p<0.0001) and post-test (p<0.0001).

Keywords: Early clinical exposure, first year MBBS, obesity, over-weight

1. Introduction
Early Clinical Exposure (ECE) aims to provide human contact in a social or clinical context that enhances learning and enables the pre-clinical students to:

a) [a] Know the relevance and context of basic sciences in diagnosis, patient care and treatment
b) Recognize attitude, ethics and professionalism as integral to the doctor-patient relationship.
c) Understand the socio-cultural context of diseases [1].

ECE is one of the many methods for modifying the medical curriculum to meet tomorrow's need by bridging the gap between pre-clinical and clinical sciences to enable smooth transition of medical student to a competent physician. ECE is a teaching and learning methodology which promotes human contact in a social or clinical context during the pre-clinical medical years, [2] before the students are posted for official clerkship and internship training programs. [3, 4] ECE programs should emphasize the active role of students and provide timely supervision and feedback [2].

ECE can be implemented in three ways

a) In a classroom setting: wherein a mobile patient is brought to the classroom and both the basic science and clinical science teachers discuss the patient's ailment with the students
b) In the hospital setting: wherein the students have an additional advantage of being exposed to the environment in the wards and outpatient departments
c) In the community setting: wherein students visit communities to learn about the living conditions of under-privileged groups and how their living conditions influence their health.

In the community setting, students have the opportunity to start contemplating in terms of prevention of disease and promotion of health. [3, 4] Observation, small group teaching, clinical bedside teaching, supervision and feedback, reflective journal writing, self-learning, case-based learning, lectures, and shadowing were common teaching and learning activities in ECE

programs [4]. Besides experiential learning during ECE, medical students also engage in situational learning while adhering to the community viewpoint [5]. Besides providing relevance to teaching of basic medical sciences to pre-clinical students, ECE can help them develop communication skills and the desired attitudes, and also provide opportunities to inculcate professional behaviour at an early stage [6, 7].

Successful implementation of ECE requires "vertical integration" with inter-disciplinary contribution and teamwork [3]. By integrating basic and clinical sciences, ECE can contribute to better understanding of the relevance of basic science and hence, better gratification among medical students. [8] Provision of opportunities to actively interact and learn from patients and the clinicians can enrich their learning experience. By introducing the students to basic clinical skills, professionalism and student-patient relation, it can facilitate smooth transition into clinical training. [9] If the basic science and clinical science teachers assume the role of facilitators in the teaching-learning process, students feel a sense of responsibility to undertake self-directed learning [3]. ECE helps activate the process of professional socialization and the development of mentoring relationships [10]. The ECE experience provides positive motivation toward medical education and in turn improves students' performance in examinations [11]. ECE has been successfully imparted by using the Internet [12]. Computer assisted visual aids [13] and other web-based instructional materials [14] Computer-assisted learning packages were found to give the most benefit to the low achievers while high achievers were less affected by the method of instruction [15].

2. Materials and Methods

This comparative, before-and-after type of study was conducted at a medical college in Western India. The participants included all first-year MBBS students, aged 18 years and above, of either sex, who gave written informed consent. Those students who did not give written informed consent or those who were absent during the traditional didactic lectures (TDLs) or integrated teaching (IT) with early clinical exposure (ECE) or pre-test or post-test were excluded. The purpose of the study was explained to first-year MBBS students and written informed consent was obtained from those willing to participate in the study. TDLs were delivered on obesity and related topics, as per syllabus for the first-year MBBS course. A pre-test was conducted after TDLs. The pre-test comprised ten questions (two marks per question; total 20 marks). After the pre-test, IT with ECE was conducted. Using a questionnaire that was identical to that of the pre-test, the post-test was conducted after IT plus ECE. The outcome studied was the difference in scores after TDLs (by a pre-test) and IT plus ECE (by a post-test).

The data were entered in Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, WA, USA) and analyzed using SPSS statistical software Windows Version 25.0 (IBM Corporation, Armonk, NY, USA). The data were presented as mean and standard deviation (SD) or as percentages, as applicable. 95% confidence interval (CI) was calculated using the formula: [Mean-(1.96)*Standard Error)]-[Mean+(1.96)*Standard Error)]. The statistical significance was determined at $p<0.05$.

3. Results and Discussion

A total of 79 students (31 females; 39.24% and 48 males; 60.76%) participated in the study.

3.1 Pre-and Post-Test Scores

Highly significant differences ($p<0.0001$) were observed between the scores in the pre- and post-tests in the present study (Table-1). Another study [16] has reported statistically significant differences (p=0.011) between the scores in the pre- and post-tests.

Table 1: Difference in pre- and post-test mean scores (out of 20)

Parameter	Females (n=31)		Males (n=48)	
	Pre-test	Post-test	Pre-test	Post-test
Mean	12.29	16.52	9.48	14.21
SD	3.28	1.75	2.78	2.32
95% CI	11.14–13.44	15.90–17.13	8.69–10.26	13.55–14.87
Paired 't' value	6.335		9.050	
'p' value	<0.0001 *		<0.0001 *	

SD = Standard deviation; CI = Confidence interval; *highly significant

3.2 Gender differences in mean scores

As depicted in Table-2, the gender difference in mean scores was highly significant ($p<0.0001$) in the pre-test, as well as in the post-test. The study habits and study methods of medical students are reported to differ by gender, which has a significant impact on performance outcomes of learners. [17] But, another study [18] found no significant gender-based difference in scores of medical students.

Table 2: Gender differences in mean scores (out of 20)

Parameter	Pre-test		Post-test	
	Females (n=31)	Males (n=48)	Females (n=31)	Males (n=48)
Mean	12.29	9.48	16.52	14.21
SD	3.28	2.78	1.75	2.32
95% CI	11.14–13.44	8.69–10.26	15.90–17.13	13.55–14.87
Z value	3.942		5.029	
'p' value	<0.0001 *		<0.0001 *	

SD = Standard deviation; CI = Confidence interval; Z = Standard error of difference between two means; * Significant

In the pre-test as well as the post-test, the minimum, first quartile, median, third quartile and maximum scores (out of 20) were much higher for female students, compared with the scores obtained by their male counterparts. (Fig-1)

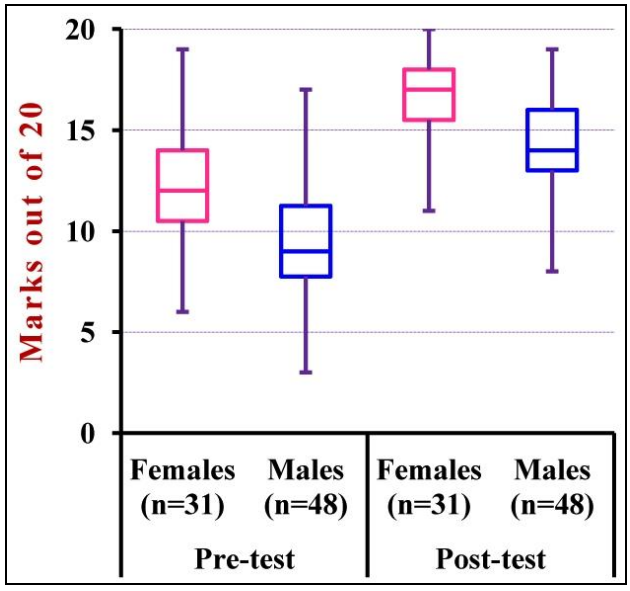

Fig 1: Box plot depicting scores

3.3 Feedback from Students

During the feedback session, 70 (88.61%) found that the learning environment was comfortable, 74 (93.67%) thought that ECE would be useful experience to draw back on, when they are posted in clinical settings, 71 (89.87%) reported better clarity and communication. A study [19] reported that majority of medical students found ECE to be an experience that strengthened their learning in the pre-clinical phase, helped them appreciate the application of basic sciences knowledge in clinical problem-solving, to communicate the relevance of basic sciences to their future practice and to prepare them for the transition to clinical settings. In another study [20], many students stated that ECE increased their sensitivity toward patient problems and needs, apart from increasing their interest and understanding of the subject.

4. Conclusion

Though this study was conducted on only one batch of first-year MBBS students, it was found that the students' scores increased significantly after their exposure to integrated teaching with early clinical exposure. The gender difference in mean scores was highly significant in the pre-test as well as in the post-test. However, implementation of ECE requires more manpower, time and efforts from the teachers' viewpoint. Video demonstration of clinical cases, use of the Internet, computer-assisted visual aids can be helpful in implementing ECE.

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