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OUTCOME OF PEER-ASSISTED LEARNING WITH CLINICAL SCENARIOS

Physiology

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ABSTRACT

This educational intervention study was conducted in a municipal medical college in Maharashtra, India. 60 first-year MBBS students aged 18 years and above, of either gender, were briefed about peer-assisted learning. A pre-test was administered after a faculty-delivered conventional lecture. Subsequently, a trained peer teacher taught the same topic and an identical test was again administered. The mean marks (out of 20) of students increased from 15.37 +/- 2.69 (pre-test) to 17.80 +/- 1.97 (post-test), exhibiting significant difference ($p<0.00001$). The differences in the mean marks obtained in the pre-and post-tests by male ($p=0.000079$) and female ($p=0.000063$) students were also significant. The gender differences in the mean marks were not statistically significant in the pre-test ($p=0.633$) and the post-test ($p=0.696$). The results suggest that case scenarios combined with peer-assisted learning increases cognitive domain scores and have the potential to be used as a supplementary method, as an adjunct to faculty teaching.

KEYWORDS

Clinical scenarios, Peer-assisted Learning, Physiology

INTRODUCTION

Peers are individuals whose are on par with one another in terms of parameters, such as, age, socio-economic, or educational status. Peers have mutually shared interests and have a sense of belonging, which confers prospects for developing inter-personal relationships [1]. In peer-assisted learning (PAL), students who are status-equals [2,3], help each other to learn. The peer teacher (PT) is at the same educational level as the taught in "same-year peer teaching", while in "cross-year peer teaching", the PT, who is at a higher educational level, teaches students who are at a lower educational level [4]. PAL includes peer teaching, peer assessment and feedback, peer mentoring and peer leadership, monitoring and team work on tasks [5]. In certain situations, the learning outcomes achieved after PAL may be similar to that achieved by professional specialist teachers [5,6]. Due to their comparable social status, PTs have "social congruence" [7] and concepts are clarified at the requisite level because they comprehend each other's vocabulary ("cognitive congruence") [8]. PAL helps students support each other with less formality, compared to that involve in the presence of teachers [9] owing to rank- and hierarchy-based communication barriers [10]. From the student's viewpoint, PAL helps in scoring in examinations [9,11]. This interactive teaching-learning method has been shown to boost cognitive and psychomotor domain scores of medical students, which is similar to that achieved by other teaching-learning methods [9].

The Medical Council of India has advocated early clinical exposure for first-year MBBS students [12]. Incorporation of actual or hypothetical clinical scenarios while teaching first-year medical students will generate interest in a particular topic, assist in connecting concepts [13], augment long-term retention [14], facilitate recall of prior knowledge when necessary [15], bridge the gap between bookish knowledge and its practical application [16], and result in better grasp among students [17]. Early clinical exposure can enable identification of applied aspects of basic sciences [17].

The objective of the present study was to determine the outcome of PAL with clinical case scenarios in improving cognitive domain scores.

MATERIALS AND METHODS

This before-and-after type of educational intervention study was conducted in a municipal medical college in Maharashtra, India where sixty students are admitted to the MBBS course each year. After obtaining written informed consent, the participants (first-year MBBS students, aged 18 years and above, of either gender) were briefed about PAL and the students were asked to volunteer as a peer-teacher (PT). This volunteering PT was trained in teaching. After a faculty-delivered conventional lecture as per University syllabus, a pre-test was administered, which contained 10 short-answer questions (SAQs), each carrying two marks (total 20 marks). Subsequently, the PT taught the same topic using case-based scenarios, in presence of faculty members and a post-test (identical to the pre-test) was administered.

The data were statistically analysed using EpiInfo Version 7.0 (public domain software package from the Centers for Disease Control and Prevention, Atlanta, GA, USA). Continuous data were presented as Mean and Standard Deviation (SD). 95% Confidence interval (CI) was stated as: [Mean-(1.96)*Standard Error)] - [Mean+(1.96)*Standard Error)]. The standard error of difference between two means was calculated. Statistical significance was determined at $p<0.05$.

RESULTS AND DISCUSSION

A total of 60 first-year MBBS students (30 females and 30 males) participated in this study.

Overall marks: The mean overall marks (out of 20) increased from 15.37 +/- 2.69 (95% CI: 14.69 – 16.05) to 17.80 +/- 1.97 (95% CI: 17.30 – 18.30). The difference in the overall mean marks obtained in the pre-and post-tests was statistically significant ($Z=5.655$; $p<0.00001$). Statistical significance was also exhibited by the differences in the mean marks obtained in the pre-and post-tests by male ($Z=3.947$; $p=0.000079$) and female ($Z=4.003$; $p=0.000063$) students. (Table-1)

Table-1: Marks obtained in pre- and post-tests

	Pre-test Mean (SD)	Post-test Mean (SD)	Z value	p value
Overall (n=60)	15.37 (2.69)	17.80 (1.97)	5.655	<0.00001 *
Males (n=30)	15.20 (2.66)	17.70 (2.23)	3.947	0.000079 *
Females (n=30)	15.53 (2.75)	17.90 (1.71)	4.003	0.000063 *

SD = Standard deviation; Standard error of difference between two means *Significant

In the present study, the differences in overall mean pre- and post-test scores and also that between the pre- and post-test scores of male and female students, exhibited statistical significance. Similar results have been reported by other researchers [18,19]. Even though the PTs are

not experts in the subject or in teaching [20], social and cognitive congruence between the PTs and students permits free discussion since the students are less diffident in asking questions [2,8]. Since PTs tend to know the students at a personal level, they comprehend the students' learning problems and are inclined to be less demanding [21]. PAL, reportedly, has its drawbacks, such as, lack of seriousness among the PTs and the students, unreliable quality of peer teaching and lack of confidence in performing the role of a PT. [22]

Gender-wise scores: In the pre-test, the third quartile (17), median (16) and minimum (10) marks were identical for students of both genders, while in the post-test, the maximum marks (20), third quartile (19) and median (18) marks were identical. The post-test minimum mark (out of 20) for females was 13 while that for males was 11. (Fig.1)

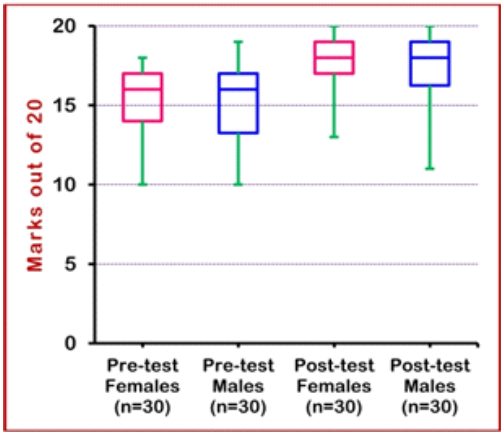

Fig.1: Boxplot: Gender differences in scores

Table-2: Gender difference in marks obtained in pre- and post-tests

	Males (n=30)	Females (n=30)	Z value	p value
	Mean (SD)	Mean (SD)		
Pre-test	15.20 (2.66)	15.53 (2.75)	0.477	0.633
Post-test	17.70 (2.23)	17.90 (1.71)	0.390	0.696

SD = Standard deviation; Standard error of difference between two means

The mean marks (out of 20) obtained by male students increased from 15.20 +/- 2.66 (95% CI: 14.25 – 16.15) in the pre-test to 17.70 +/- 2.23 (95% CI: 16.90 – 18.50) in the post-test, while that obtained by their female counterparts increased from 15.53 +/- 2.75 (95% CI: 14.55 – 16.52) to 17.90 + / – 1.71 (95% CI: 17.29 – 18.51). The gender difference in the mean marks obtained in the pre-test (Z=0.477; p=0.633) and post-test (Z=0.390; p=0.696) was not significant. (Table-2)

Limitations: Due to time constraints of the first-year MBBS course, the participants could not be exposed to real-life patients. A larger study using identical educational intervention would be necessary in order to generalize the results.

CONCLUSION

The results of this study suggest that case scenarios combined with PAL increase cognitive domain scores and have the potential to be used as a supplementary method, as an adjunct to faculty teaching. Formalizing the use of case scenarios combined with PAL in medical colleges will amplify the teaching skills of both PTs and faculty.

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