ORIGINAL RESEARCH PAPER

Volume-9 | Issue-5 | May-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EXPERIENCE WITH INTEGRATED TEACHING FOR FIRST-MBBS STUDENTS

Physiology

Srabani Bhattacharya* Professor and Head, Physiology Department, Rajiv Gandhi Medical College, Kalwa, Thane-400 605, Maharashtra, India *Corresponding Author

Sundaram Kartikeyan Professor and Head, Community Medicine Department, Rajiv Gandhi Medical College, Kalwa, Thane-400 605, Maharashtra, India

ABSTRACT

This comparative, before-and-after study (without controls) was conducted on first-year MBBS students to determine the difference in cognitive domain scores after curriculum-based teaching and after focused integrated educational intervention. Those students who did not give written informed consent or those who were absent during the educational interventions, or pre-test or post-test were excluded.After traditional curriculum-based teaching on electrocardiogram, the students took a pre-test. After the pre-test, the participants attended a focused integrated educational intervention using a combination of integrated teaching with clinical scenarios on the same topic. Subsequently, the post-test was administered using a questionnaire that was identical to that of the pre-test. Though the post-test scores significantly (Z=4.422; p<0.0001) improved among male students, the gender differences in scores were not significant, both in the pre-test (Z=1.204; p=0.228) and in the post-test (Z=0.433; p=0.664).Afocused educational intervention with integrated teaching can improve the cognitive domain scores of participating students.

KEYWORDS

Electrocardiogram, First-year MBBS, Integrated teaching

INTRODUCTION

Integrated teaching (IT) involvesblending of teaching material and inter-relating different aspects of the same topic, which is routinely taught by different academic departments as parts of separate subjects. [1] Horizontal integration refers to the amalgamation and fusion of teaching in two or more subjects that are taught in the same phase of the curriculum, while vertical integration is that between subjects taught in the different phases of the curriculum. [2] Since the dissemination of information from diverse subjects is synchronized, IT saves time and efforts of teachers, [3] prevents the patchy and acquisition of disjointed and segregated bits of information in isolation and converts knowledge into handy tools for learning new know-how, [4] provides learners with a holistic outlook and enables them to comprehend new perspectives [5] and enables applied learning and constructive clinical reasoning. [6] Defining the core curriculum, sequencing content, faculty proficiency and interdisciplinary integration are among the pre-requisites for teaching physiology in an integrated curriculum. [7]

Harden's integration ladder [8] envisages curricular integration as an eleven-step ladder, with subject-based isolated teaching comprising the first four steps of the ladder while increasing levels of cross-disciplinary integration is represented in the upper six steps. In the final eleventh step of the ladder, the student takes more responsibility for the integration and is empowered with the requisite tools. [8] IT has been extensively implemented after realizing that the traditional modes of teaching pre-clinical subjects as water-tight compartments without cross-links and clinical applications often let down the students when they proceed to clinical clerkships. [9, 10] An integrated approach to education enables applied learning and constructive clinical reasoning. [11]

In order to provide medical students with holistic learning perspectives, the Medical Council of India has recommended IT between conventional subjects using a setting of clinical relevance to achieve both horizontal and vertical integration in different phases of the Bachelor of Medicine, Bachelor of Surgery (MBBS) course. [12]

The “must know” component of information should be taught in an integrated manner. [13] The topics for IT are usually selected on the basis of interdisciplinary nature, preventability, and conditions that portray basic science concepts. [14] IT disseminates information from various disciplines and saves time and efforts of teachers. [3] The objective of this study was to compare the cognitive domain scores obtained by first-year MBBS students after traditional didactic lectures with that obtained after integrated teaching.

MATERIALS AND METHODS

This comparative, before-and-after study (without controls) was conducted at a municipal medical college in Maharashtra State, India. The participants included first-year MBBS students, of either sex, who gave written informed consent. Those students who did not give written informed consent or those who were absent during the educational interventions, or pre-test or post-test were excluded.

After traditional curriculum-based teaching on electrocardiogram, the students took a pre-test comprising five questions (two marks per question; total 10 marks). After the pre-test, the participants attended a focused educational intervention using a combination of integrated teaching with clinical scenarios on the same topic. Subsequently, the post-test was administered using a questionnaire that was identical to that of the pre-test. The outcome studied was the difference in cognitive domain scores after traditional curriculum-based teaching (by a pre-test) and after focused educational intervention (by a post-test).

The data were entered in Microsoft Excel Spreadsheet (Microsoft Corporation, Redmond, WA, USA) and presented as mean and standard deviation (SD). 95% Confidence interval (CI) was calculated using the formula: [Mean-(1.96)*Standard Error)] - [Mean+(1.96)*Standard Error)]. EpiInfo Version 7.0 (public domain software package from the Centers for Disease Control and Prevention, Atlanta, GA, USA) was used for statistical analyses. The standard error of difference between two means was calculated. Feedback was presented as percentage distribution. Statistical significance was determined at p<0.05.

RESULTS AND DISCUSSION

There were 79 participants – 31 (39.24%) females and 48 (60.76%) males.

Gender difference in scores: In the pre-test, the mean scores (out of 10) were 6.35 +/- 1.96 (95% CI: 5.67–7.04) and 5.83 +/- 1.73 (95% CI: 5.34 – 6.32) for females and males, respectively. In the post-test, the mean scores (out of 10) were 7.16 +/- 1.77 (95% CI: 6.54–7.78) and 7.33 +/- 1.59 (95% CI: 6.88 – 7.78) for females and males, respectively. However, the gender differences in scores were not statistically significant, both in the pre-test (Z=1.204; p=0.228) and in the post-test (Z=0.433; p=0.664). However, several studies [15-19] have reported gender differences in learning styles.

Table -1: Pre-testversus post-test scores(out of 10)

	Females (n=31)		Males (n=48)	
	Pre-test	Post-test	Pre-test	Post-test
Mean	6.35	7.16	5.83	7.33
SD	1.96	1.77	1.73	1.59
95% CI	5.67 – 7.04	6.54 – 7.78	5.34 – 6.32	6.88 – 7.78
Z value	1.707		4.422	
'p' value	0.087		<0.0001 *	

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

CI = Confidence interval; * Significant

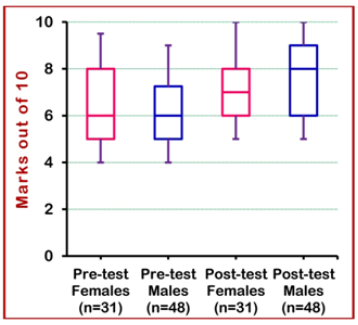

Fig-1: Box plot depicting pre- and post-test scores(out of 10)

Feedback: The anonymous feedback obtained from students (n=79) is tabulated in Table-2.

Table-2: Feedback obtained from students

Statement	Per cent (n=79)
Helps understand basic science subjects	93.67
Facilitates self-learning, deep-learning & problem-solving	86.08
Helps prepare for examination	62.03
Prevents repetition and wastage of time	46.84
Application of knowledge for clinical practice	81.01
Too much information in less time	63.29
Selection of topics &departments is essential	70.89
Vertical Integration is better than didactic lectures	46.84
Applied aspects - more scores in First year exams	72.15

Scores in pre-test versus post-test:

The differences in pre- and post-test scores (out of 10) were not statistically significant ($Z=1.707$; $p=0.087$) for females but were highly significant ($Z=4.422$; $p<0.0001$) for males. (Table-1) In the pre-test, the minimum score, first quartile and median scores were identical for both sexes. In the post-test, the minimum score, maximum score and first quartile were identical for both sexes, but the median and third quartile were higher for male students. (Fig-1). The post-test scores significantly improved among male students. (Table-1)

CONCLUSION

Despite time constraints in the teaching schedule for the first-year MBBS course, a combined method of focused educational intervention with integrated teaching can improve the cognitive domain scores of participating students.

REFERENCES

1. Joglekar, S., Bhuiyan, P. S., & Kishore, S. (1994), "Integrated teaching - our experience." J Postgrad Med, 40(4), 231-232.
2. Basu, M., Das, P., &Chowdhury, G. (2015), "Introducing integrated teaching and comparison with traditional teaching in undergraduate medical curriculum: A pilot study." Med J DY PatilUniv, 8(4),431-438.
3. Taren, D. L., Thomson, C. A., Koff, N. A., Gordon, P. R., Marian, M. J., Bassford, T. L., et al. (2001), "Effect of an integrated nutrition curriculum on medical education, student clinical performance, and student perception of medical-nutrition training." Am J ClinNutr, 73(6),1107-1112.
4. Lipson, M. Y., Valencia, S. W., Wixson, K. K., & Peters, C. W. (1993), "Integration and Thematic Teaching: Integration to Improve Teaching and Learning." Language Arts, 70(4),252-263.
5. Atwa, H. S., & Gouda, E. M. (2014), "Curriculum Integration in Medical Education: A Theoretical Review." Intel Prop Rights, 2, 113.
6. Vidic, B., &Weitlauf, H. M. (2002), "Horizontal and vertical integration of academic disciplines in the medical school curriculum." ClinAnat, 15(3),233-235.
7. Tufts, M. A., &Higgins-Opitz, S. B. (2009), "What makes the learning of physiology in a PBL medical curriculum challenging? Student perceptions."AdvPhysiolEduc, 33(3):187-195.
8. Harden, R. M. (2000), "The integration ladder: A tool for curriculum planning and evaluation." Med Educ, 34(7), 551-557.
9. Cooke, M., Irby, D. M., Sullivan, W, &Ludmerer, KM. (2006), "American Medical Educations 100 years after the Flexner Report." N Engl J Med, 355(13),1339-1344.
10. Custers, E., & Cate, O. T. (2002), "Medical students' attitudes towards and perception of the basic sciences: A comparison between students in the old and the new curriculum at the University Medical Center Utrecht, The Netherlands." Medical Med Educ, 36(12),1142-1150.
11. Mann, K. V. (2002), "Thinking about learning: implications for principle-based professional education." J ContinEduc Health Prof, 22(2),19-26.
12. Medical Council of India. (2017), "Regulations on Graduate Medical Education - Amended up to 10th March 2017." New Delhi: Medical Council of India,p. 2.
13. Bhuiyan, P. S., &Pandit, D. D. (2015), "Integrated teaching".In: Bhuiyan, P. S., Rege, N. N., Supe, A. N. (Eds.), The art of teaching medical students. New Delhi: Reed Elsevier,370-378.
14. Hasan, Z., &Sequeira, R. (2012), "Challenges of Teaching Physiology in an Integrated System-Based Curriculum." Can Med Educ J, 3(1), e73-e76.
15. Wehrwein, E. A., Lujan, H. L., &DiCarlo, S. E. (2007), "Gender differences in learning style preferences among undergraduate physiology students."AdvPhysiolEduc, 31(2), 153-157.
16. Philbin, M., Meier, E., Huffman, S., &Boverie, P. (1995), "A survey of gender and learning styles." Sex Roles, 32(7), 485-494.
17. Severiens, S. E., &Ten Dam, G. T. M. (1994), "Gender differences in learning styles: A narrative review and quantitative meta-analysis." High Educ, 27(4), 487-501.
18. Zimmerman, B. J., &Martinez-Pons, M. (1990), "Student differences in self-regulated learning: relating grade, sex, and giftedness to self-efficacy and strategy use." J EducPsychol, 82(1), 51-59.
19. Miller, C. D., Finley, J., &McKinley, D. L. (1990), "Learning approaches and motives: Male and female differences and implications for learning assistance programs." J College Student Dev, 31(2), 147-154.