



Vertical integration in the teaching of final year medical students

MARIA KOSHY¹, SELVIN SUNDAR RAJ MANI^{*}, SUDHA JASMINE RAJAN¹, RAMYA IYYADURAI¹, SOWMYA SATHYENDRA¹

¹Department of Medicine, Christian Medical College, Vellore, India

**Corresponding author:*

Selvin Sundar Raj Mani,

Department of Medicine Unit 3, Christian Medical College, Vellore 632 004, India.

Tel: +91-416-2282039; **Email:** selvinsr@gmail.com

Please cite this paper as:

Koshy M, Mani SSR, Rajan SJ, Iyyadurai R, Sathyendra S. Vertical integration in the teaching of final year medical students: A qualitative-quantitative evaluation. *J Adv Med Educ Prof.* 2018;6(4):188-189.

Received: 12 November 2017

Accepted: 9 August 2018

Dear Editor,

The traditional approach to medical education has been dichotomous, with a lack of integration between basic sciences and clinical medicine (1). Recent reforms have called for individualizing the learning process, integrating knowledge with practice, and cultivating a spirit of lifelong learning (2). Vertical integration breaks the traditional division between clinical and pre-clinical sciences, resulting in better understanding and application of concepts (3). We did an exercise to integrate basic sciences and clinical medicine in the teaching of medical students. After obtaining informed consent and ethical clearance, a group of final year undergraduate students underwent vertically integrated, small group, problem-based training on tuberculosis. We studied the effect of the integration on the students' understanding of the subject and acceptance of this method. Students were divided into intervention and control arms of 10 students each, based on the medical units in which they were posted. The control arm underwent standard clinical teaching (lectures and practical sessions), as per the institutional education policy. The intervention group was given three case scenarios which highlighted the various presentations of tuberculosis, with relevant questions regarding the pathogenesis, clinical course, and management. These were discussed in a multidisciplinary interactive

session, with input from the faculty taken from the departments of Pathology, Microbiology and Internal medicine. Triangulation of data from pre- and post-test scores, focus group discussion and feedback scores was done.

When compared to the mean pre-test score, the mean post-test score in the intervention group significantly improved (6.7 vs. 12.44, mean difference: 5.74; 95% CI 2.71-8.95; $p=0.003$). There was a significant difference in the mean post-test scores between the intervention and control groups (12.44 vs 7.55, mean difference: 4.89; 95% CI 3.89-5.84; $p<0.001$). On qualitative assessment by focus group discussion, the students stressed on the usefulness of the session and felt that vertical integration facilitated "integration and application of knowledge". They were able to "recognize how diverse processes are inter-related". The problem-based approach motivated them to do self-directed learning and facilitated formulation of research ideas. In their own words, "The onus of the learning was in our hands, so we learnt better", "I had never heard of Quantiferon gold, but because of the session, I read that in detail", and "I searched Pub Med to look for articles from India which might be more relevant". The session stimulated "team building" with their peers. The small group teaching was well accepted and found to be more useful than lectures. Overall, there was a favorable perception regarding vertical integration. On discussion with the faculty, aspects of greater

commitment in terms of time and resources, and cooperation among faculty members were highlighted. The faculty was motivated to read in greater detail to clarify the students' queries. Feedback scores from the students were positive, confirming the themes which emerged from the focus group discussion. Tuberculosis is a major public health problem in India and it is important for students to have a deep understanding of the topic (4). Case-based teaching on a disease of high prevalence has been shown to improve application of knowledge (5). Our study has highlighted that such sessions help the students to form cross-links and connections, resulting in a smoother transition into clinical practice.

Conflict of Interest: None declared.

References

1. Michael J. Where's the evidence that active learning works? *Adv Physiol Educ.* 2006; 30: 159–67.
2. Barzansky B. Abraham Flexner and the era of medical education reform. *Acad Med J Assoc Am Med Coll.* 2010; 85: S19–25.
3. Dahle LO, Brynhildsen J, Behrbohm Fallsberg M, Rundquist I, Hammar M. Pros and cons of vertical integration between clinical medicine and basic science within a problem-based undergraduate medical curriculum: examples and experiences from Linköping, Sweden. *Med Teach.* 2002; 24: 280–5.
4. Satyanarayana S, Subbaraman R, Shete P, Gore G, Das J, Cattamanchi A, et al. Quality of tuberculosis care in India: a systematic review. *Int J Tuberc Lung Dis Off J Int Union Tuberc Lung Dis.* 2015; 19: 751–63.
5. Badyal DK, Singh T. Teaching of the basic sciences in medicine: Changing trends. *Natl Med J India.* 2015; 28: 137–40.