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BEME Spotlight 30

The effectiveness of team-based learning on learning outcomes in health professions education

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Review citation

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Review website

http://bemecollaboration.org/Published+Reviews/BEME+Guide+No+30/

Keywords

Team-based learning, team learning, TBL, health professions education, systematic review

Headline conclusions

1. This review included 14 primary studies comparing TBL to a more traditional learning method and found that at least half the studies showed statistically significant improvement in knowledge scores after implementing a TBL curriculum.
2. Learner reaction to TBL generally was not higher than the comparator group, even when students' knowledge scores increased; that is, despite improved performance, students did not prefer TBL to the alternate teaching method.
3. The results for knowledge outcomes appeared to be consistent regardless of the type of comparator used in the included studies. The majority of comparison groups in this review were comprised of traditional lectures, while CBGD and SGL were also common alternative teaching methods to TBL.
4. TBL appears to be equally effective across health professions disciplines.

Background and context

Team-based learning (TBL) is an active learning strategy currently being implemented in health professions education in response to a growing desire to see students become more engaged in their learning. TBL is grounded in student-centred learning, requiring less faculty time and fewer resources than other active learning methods (Koles P, Nelson S, Stolfi A, Parmelee D & Destephen D, 2005). While TBL may have real pedagogical value, individual studies present inconsistent findings. Additionally, no systematic review of the effectiveness of TBL has been conducted in health professions education, which comprises a unique educational discipline (Amin & Eng, 2009).

Review objectives

Review aim: By systematically evaluating the effects of TBL in health professions, this review aims to provide educators with a comprehensive synthesis of the current evidence to guide decision-making regarding the implementation of TBL into their curricula.

Review scope: This review screened for studies reporting outcomes based on a modified Kirkpatrick framework. However, in the studies that met inclusion criteria, knowledge scores (in the form of exam scores or letter grades) and learner reaction were the only two types of outcomes reported. The definition of TBL used in this review was approved by two experts in the field in order to capture the essential elements of TBL without being overly restrictive; though other TBL models exist (e.g. hybrid models), primary studies implementing these models were excluded on the basis that their outcomes could not be a true evaluation of TBL if only certain elements of TBL were used. All health professions educational settings were included

Review methodology

Search Strategy: A comprehensive search strategy was developed by a health science librarian in consultation with the co-authors. For online database searches, two search strategies were used depending on whether the database in question was health related or not. The reference lists of all included studies were hand searched and a separate cited reference search was conducted using Web of Science and SCOPUS for each included study to identify papers where it had been cited. Relevant conference proceedings were hand searched and the first authors of the primary studies included were also contacted for any ongoing or unpublished research relevant to our review.

Inclusion and Exclusion Criteria: Included studies took place in health professions education in any postsecondary institution in the world. Studies were required to use a standardized definition of TBL outlined in the review. Primary studies were required to report a comparator group implementing another active or traditional learning strategy. The studies had to report outcomes for both TBL and the comparator group. Specific reasons for exclusion were noted for each of the abstracts screened.

Data Extraction: Pertinent information and descriptors from each study were extracted into a Microsoft Excel based data extraction form that included information on the country in which the study was conducted, the study's primary objective, the specific format in which TBL was delivered (e.g. all lectures replaced with TBL), details of the comparison teaching method, the authors' primary outcome, and any secondary outcomes. A random sample of 20% of the data was selected for data extraction by a second reviewer and no major discrepancies were noted.

Data Synthesis: Study findings were categorized according to a modified Kirkpatrick framework and analyzed through an iterative process which involved consideration of the population type, the nature of the comparison group, the rigour of the study designs and outcomes reported.

Quality assessment was performed using a Cochrane Risk of Bias tool for controlled trials and Newcastle-Ottawa Scale for cohort studies (Higgins & Green, 2009). A star rating system was used to code and compare the cohort studies (Hartling et al., 2012).

Implications for practice

Team-based learning appears to improve knowledge scores but yields mixed positive and negative learning reaction. Curriculum planners who do implement TBL are advised to take precautions to mitigate potentially negative learner reactions to this teaching strategy.

TBL appears to be successful over a variety of settings and populations within health professions education in this small group of studies.

More robust, controlled primary studies with thorough reporting and with inclusion of higher lever learning outcomes such as application skills and behaviours, would be helpful to establish a stronger evidence base for curriculum planners considering implementation of TBL.

References

Amin Z & Eng KH. 2009. *Basics in Medical Education.* Hackensack, NJ; World Scientific.

Higgins PT, Green S, ed. 2009. *Cochrane Handbook for Systematic Reviews of Interventions.* Available from: http://cochrane-handbook.org

Hartling L, Hamm M, Milne A, Vandermeer B, Santaguida PL, Ansari M, Tsertsvadze A, Hempel S, Shekelle P, Dryden DM. 2012. Validity and Inter-Rater Reliability Testing of Quality Assessment Instruments [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US).

Koles P, Nelson S, Stolfi A, Parmelee D & Destephen D. 2005. Active learning in a Year 2 pathology curriculum. *Medical Education*, 39(10). 1045-1055.

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