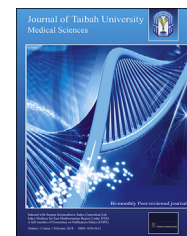




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Original Article

Effectiveness of the team-based learning (TBL) strategy on medical students' performance

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المخلص

أهداف البحث: يمثل 'التعلم المبني على فريق' استراتيجية تعليمية جديدة ومثيرة للاهتمام. فهو يساعد على تعزيز الكفاءات المهنية للطلاب، ويعمل بشكل مثالي لإعدادهم في سعيهم للتعليم مدى الحياة. الهدف من هذه الدراسة هو تقييم فاعلية 'التعلم المبني على فريق' كاستراتيجية تعليمية، على أداء طلاب طب يدرسون في منهج تعلم مبني على مشكلة.

طرق البحث: أجريت دراسة مقطعية من خلال استبانة ذاتية التصميم. شُيِّد الاستبانة لفحص عدة جوانب من 'التعلم المبني على فريق'، بما في ذلك الإدراك، والمهارات الاجتماعية، ونظام التعليم في المدرسة الثانوية، والتنمية الذاتية. تمت دعوة 112 طالباً للمشاركة في الدراسة وأكمل 100 منهم الاستبانة. تم جمع نتائج كل من 'اختبارات ضمان استعداد الفرد' و'اختبارات ضمان استعداد المجموعة' كما تم تحليل البيانات ومقارنتها بنتائج التقييم النهائي باستخدام البرنامج الإحصائي للعلوم الاجتماعية.

النتائج: وصف 52 طالباً (52%) 'التعلم المبني على فريق' بأنه ينبئ بيئة تعلم تعاونية. ووجد 64 طالباً (64%) أن المواد أسهل فهمًا عند مناقشتها فيما بينهم كمجموعة. وبالمقارنة مع نتائج الامتحانات النهائية، كان هناك ارتباط ذا قيمة إحصائية بين أداء 'اختبارات ضمان استعداد الفرد' ودرجة الامتحان النهائي. وبالإضافة إلى ذلك، كان هناك ارتباط كبير بين نظام التعليم الثانوي ونتيجة 'اختبارات ضمان استعداد الفرد'، حيث لوحظ أفضل أداء بين الطلاب القادمين من المدارس التي تستخدم المنهج البريطاني.

الاستنتاجات: كان التصور العام وموقف الطلاب تجاه نظام 'التعلم المبني على فريق' إيجابياً وواعداً. ومع ذلك، فإن هناك بعض الملاحظات ومجالات للقلق يجب إعادة النظر فيها ومعالجتها لتحسين 'التعلم المبني على فريق' كأداة تعليمية.

الكلمات المفتاحية: التعلم المبني على فريق؛ التعليم الطبي؛ التعلم المبني على مشكلة؛ اختبارات ضمان استعداد الفرد؛ اختبارات ضمان استعداد المجموعة

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Abstract

Objectives: Team-based learning (TBL) represents a new and interesting educational strategy. It helps to enhance students' professional competencies and ideally works to prepare them in their pursuit of lifelong learning. The aim of this study is to evaluate the effectiveness of TBL as an educational strategy on medical students' performance in a problem-based learning (PBL) curriculum.

Methods: A cross-sectional study was conducted through a self-designed questionnaire. It was constructed to examine several aspects of TBL, including cognition, social skills, high school educational system, and personal development. A total of 112 students were invited to participate in the study and 100 completed the survey. Individual-readiness assurance test (IRAT) and group-readiness assurance test (GRAT) scores were collected and the data were analysed and compared to the results of the final assessment using Statistical Package for the Social Sciences (SPSS).

Results: A total of 52 students (52%) described TBL as fostering a cooperative learning environment and 64 students (64%) found the materials to be easier to understand when discussed among themselves as a group. Compared to final examination results, there was a significant correlation ($p = 0.0001$) between IRAT performance and final exam score. In addition, there was a significant correlation between high school education system and IRAT score, where the best performance was observed among students coming from schools using the British curriculum.

Conclusions: The overall perception and attitude of students toward the TBL system was positive and promising. Nevertheless, there are some notes and areas of concern that must be re-examined and remedied to improve TBL as an educational tool.

Keywords: GRAT; IRAT; Medical education; PBL; TBL

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Introduction

Trends in medical education are shifting from passive to active learning, the latter of which is thought to result in a better understanding of learning contents and the development of new skills. The inefficiency of traditional lectures to stimulate active participation has prompted the development of new interactive teaching strategies.¹ Problem-based learning (PBL) is a student-centred learning strategy that engages medical students by presenting a health problem early in the learning process.^{2–4} Team-based learning (TBL) is a strategy that was formulated to make classroom learning more active. This method is helpful in situations where students might feel uninterested in standard or traditional learning strategies. In comparison to many traditional learning strategies, such as lectures, case-based learning, and PBL, recent studies highlight the importance of TBL as an educational alternative that is often more active and less resource intensive.⁵ The TBL method comprises three stages: (1) advanced preparation by the students, (2) the individual readiness assessment test (IRAT) and the group readiness assessment test (GRAT), and (3) application, which includes whole-class discussion and reasoning.⁶ The primary goal of TBL is to support a high level of learning, improve the application of learning at both the quantitative and qualitative levels, and support the development of students' interpersonal and teamwork skills.⁷ Furthermore, a study has revealed that TBL promotes individual student accountability, engagement, and teamwork.⁸ In addition, prior research has identified five key elements for the successful implementation of TBL, which include buy-in, expertise, resources, time, and course characteristics. Thompson highlighted the importance of buy-in from faculty, students, and administration.⁸ Furthermore, TBL has an advantage over other group learning strategies, in that a single instructor is sufficient to effectively attend to a greater number of students.⁹ TBL is based on social learning theory and appears to have real pedagogical value. Several studies have demonstrated the positive attitude of students toward TBL as a learning method.¹⁰ Teaching faculty have also demonstrated their support and favourable perception of TBL as a useful learning tool.^{10,11} Considering the rising interest in the use of TBL in the field of health professional education, as well as the increased number of studies that have been

published on this subject recently, it is both appropriate and necessary to provide a more meaningful assessment of the effect of TBL on medical education.

The research question of this study is as follows: "In a population of medical students, is TBL a useful learning tool in a PBL-oriented curriculum?" The variables include the students' performance, acquisition of knowledge, attitude, and perceptions of TBL. The objectives of the study were to explore the effectiveness of TBL in a PBL curriculum, and how it affects the students' knowledge, skills, and personal development in a learning setting using a PBL curriculum.

Materials and Methods

The participants of this study were students at the College of Medicine of the University of Sharjah, UAE, which uses a PBL curriculum that is body-system-oriented and distinguished by a significant degree of integration between disciplines. The students attend weekly review sessions, in which they receive instructions from their subject matter experts through TBL. Undergraduate students from year three were asked to participate in this cross-sectional study. The students participated voluntarily, and written, informed consent was obtained. The students' performance was assessed by comparing their scores on both the IRAT and GRAT for each review session during the semester, and then those scores were compared to their end-of-semester final examination scores. The grading system of the TBL and final examination were based on the following five categories: "Excellent with honours" represented a score equal to or greater than 90, "Excellent" represented 89–85, "Very good" represented 84–80, "Good" represented 79–75, and "Other" represented a score of less than 75.

For assessing the efficiency and effectiveness of TBL as a learning tool, students were asked to answer a 22-item questionnaire. The questionnaire included both open-ended and closed-ended questions (five open and 17 closed-ended questions) regarding the TBL method. The questionnaire consisted of two parts. Part 1 collected the students' demographic information, such as their age and gender. Part 2 addressed the research aims of this study, and included questions regarding the students' educational background and experience, their perceptions of and reactions to TBL, their development of personal and interpersonal skills through TBL, and their level of engagement in TBL.

The participants were asked to express their level of agreement or disagreement with each item using a 5-point Likert scale. Several previous studies were referred to when designing the questionnaire.^{12–15}

Before starting the survey, the researchers briefly explained the aim, objectives, and significance of the study while emphasizing the importance of voluntary participation and anonymity. Both the link to the online questionnaire on Google Forms and the consent form were emailed to 112 third-year students using their university email addresses. Google Forms was utilized in the present study due to its convenient, fast, and easy-to-use interface.

Data collection was conducted in January 2017 during the winter break to avoid the effect of exam stress on student responses. The study obtained ethical clearance from the University of Sharjah Research Ethics Committee. No

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