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Educational Article

Acquisition of knowledge, generic skills and attitudes through problem-based learning: Student perspectives in a hybrid curriculum

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الملخص

أهداف البحث: التحقق من تصورات الطلاب عن التعليم القائم على حل المشكلات في اكتساب المعارف،والمهاراتالعامة،والسلوك ذات الصلة،التي تعد المكونات الأساسية للمناهج الجامعية الطبيةالهجينة.

طرق البحث: تم تسجيل ٤٦٤ طالبا جامعيا بكلية الطب لأربع دفعات متتالية (اثنان في السنة الأولى، واثنان في السنة الثانية من برنامج كلية الطب) في كلية ملقا مانيبال الطبية، وأدرجوا في هذه الدراسة المستعرضة. استخدمت الدراسة استبانة مسبقة التوثيق تتكون من ١٥ فقرة صنفت إلى ثلاثة مجالات تهتم باكتساب المعرفة، والمهارات العامة والسلوك، وكانت إجابة الطلاب حسب مقياس ليكرت من خمس نقاط.

النتائج: حسن التعليم القائم على حل المشكلات اكتساب الطلاب للمعرفة والمهارات العامة والسلوك، مع علاقة إيجابية (٠,٤٥١-٠,٧٢) بين جميع المجالات الثلاثة. إن التعليم القائم على حل المشكلات أثر على الكفاءة النموذجية في المجالات الشخصية والمعرفية وأيضا بالمهارات المتعلقة بالعمل التي تعتبر مهمة للنجاح في الممارسة المهنية.

الاستنتاجات: إن التعليم القائم على حل المشكلات في مجموعات صغيرة، قدم للطلاب البيئة المفضلة والآمنة المواتية لتطوير المهارات والمواقف المطلوبة. هذه الدراسة لا تملء فجوة فقط ولكن أيضا تظهر مزايا التعليم القائم على حل المشكلات كما يراها الطلاب في المناهج الطبية المختلفة.

الكلمات المفتاحية: المناهج الهجينة; المعارف والمهارات والسلوك; طلاب الطب; التعليم القائم على حل المشكلات; تصورات الطلاب

Abstract

Objective: To investigate students' perceptions of problem-based learning in the acquisition of relevant knowledge, generic skills and attitudes in a setting where this is a vital component of the medical undergraduate hybrid curriculum.

Methods: 464 undergraduate medical students in four consecutive batches (two in the first year and two in the second year of the medicine programme) at Melaka Manipal Medical College were enrolled in this cross-sectional study. A pre-validated questionnaire with 15 items classified into three domains addressing acquisition of knowledge, generic skills and attitudes was developed and administered to all students, who responded on a five-point Likert scale.

Results: Problem-based learning improved the students' acquisition of knowledge, generic skills and attitudes, with positive correlations (0.451–0.72) between scores in all three domains. Problem-based learning affected not only typical competence in interpersonal and cognitive domains but also more general work-related skills considered important for success in professional practice.

Conclusions: Problem-based learning in small groups provided students with a favourable, safe environment for developing the necessary skills and attitudes. This study not only fills a gap but also shows the advantages of problem-based learning as perceived by students in a hybrid medical curriculum.

Keywords: Hybrid curriculum; Knowledge; Medical students; Problem-based learning; Skills and attitudes; Student perceptions

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Introduction

Problem-based learning is one of the most important developments in health education. This educational strategy uses real problems as a context for students to learn and has been chosen for curriculum delivery in many professional schools around the world. The activities are designed to teach not only content but also skills and generic competence. The Bachelor of Medicine and Bachelor of Surgery course at Melaka Manipal Medical College is conducted in two phases: basic sciences are taught in the first year at Manipal Campus, India, and clinical training is provided in the second phase at Melaka Campus, Malaysia. Problem-based learning was incorporated in 2006 during curricular reform, when didactic lectures were reduced by 30% and problem-based learning and other small-group learning methods were introduced, on the underlying assumption that these methods would facilitate the acquisition of relevant knowledge, skills and attitudes by the students.

Generic skills and attitudes are now widely accepted as important outcomes of a university education and are being written into virtually every curriculum. Reports in the literature suggest that this approach contributes to the acquisition of not only knowledge but also generic competence and personal skills, such as problem-solving, communication and teamwork, which are essential for all graduates of higher education.[1–3] After 6 years of experience with the hybrid problem-based learning curriculum, we decided to assess its effects on acquisition of knowledge, skills and attitudes. The aim of this study was to investigate the extent to which students had taken advantage of the approach to improve their knowledge, generic skills and attitude. Specifically, we investigated students' perceptions of their acquisition of these attributes, the effect of duration of exposure to problem-based learning and whether gender affected perceptions of the desired effects of problem-based learning.

Materials and Methods

We enrolled 464 undergraduate medical students in four consecutive batches (two in the first year and two in the second year of a Bachelor of Medicine and Bachelor of Surgery degree) at the Melaka Manipal Medical College, Manipal Campus in this cross-sectional study.

A peer-validated, structured questionnaire containing 15 items classified in three domains—acquisition of knowledge, generic skills and attitudes—was developed and administered to the students. The questionnaire was pre-validated by testing it in two small problem-based learning groups. Students rated items on a scale of 1 (strongly disagree)–5 (strongly agree) on a five-point Likert rating scale. For all items, the scale was dichotomised into "strongly agree" and "agree" responses to one category, and all other responses to a second category in order to determine the overall positive effect. The results were analysed with the statistical software package SPSS version 11.5.

Principal components analysis was used to explore domain-specific assumptions distributed over the 15 items of the questionnaire in order to categorise them into the three domains of knowledge, attitude and skills. Item-wise analysis of scores and a principal components exploratory factor analysis with varimax rotation were performed on all survey items for all classes.

The Kruskal–Wallis test was used to compare the outcome variables in the four groups, to test the null hypothesis that all populations have identical distribution functions against the alternative hypothesis that at least two of the samples differ only with respect to location (median), if at all. Median and inter-quartile scores of the domains are reported and compared between batches. The median total scores of different subgroups of respondents were compared in appropriate non-parametric tests. A p value of <0.05 was considered significant.

The results of the investigation of gender differences in perception of acquisition of knowledge and skills are expressed as proportions for each item.

Results

The overall response rate was 98.3% (456/464). In a factor analysis of responses to all items on the questionnaire, the knowledge domain, with eight items, had a maximum score of 40; the generic skills domain, with five items, had a maximum score of 25; and the attitudes domain, with three items, had a maximum score of 15.

Three factors in the three domains explained 57.5% of the variance in the data (Figure 1). The first factor, which comprised items 1–6, 9 and 15 on the questionnaire (Appendix A), explained 22.7% of the variance; the second factor, comprising items 7, 8 and 10–12, explained 9.1% of the variance; and the third factor, consisting of items 12–14, explained 15.7% of the variance (Table 1). Item 12 was included in both the second and third factor but was more

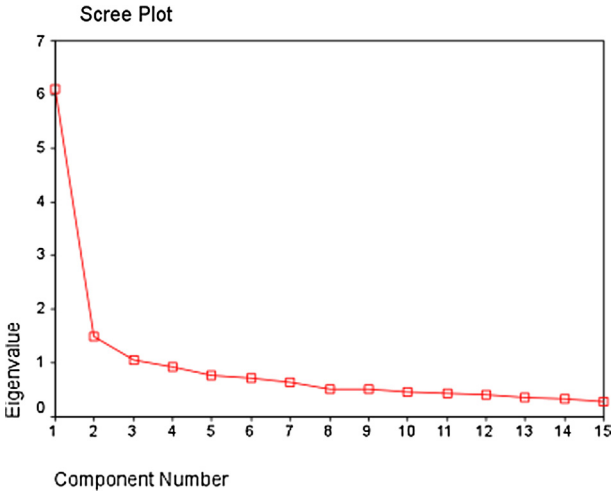

Figure 1: Factors in the three domains that explained variance in the data.