Journal of Taibah University Medical Sciences (2014) 9(4), 289–292

Taibah University

Journal of Taibah University Medical Sciences

www.sciencedirect.com

Educational Article

Effectiveness of case-based teaching of physiology for nursing students

Farrukh Majeed, FCPS

Department of Physiology, College of Medicine, University of Dammam, Dammam, Kingdom of Saudi Arabia

Received 21 October 2013; revised 23 December 2013; accepted 26 December 2013; Available online 8 August 2014

الملخص

أهداف البحث: يعتبر التعليم المعتمد على الحالة نهجا جديدا نسبيا في تعليم العلوم الأساسية. على الرغم من أن هذه الطريقة قد استخدمت في التعليم الطبي لعدد من السنوات، إلا أن هناك محاولات قليلة بذلت لدراسة فاعلية هذه الطريقة على طلاب التمريض. الهدف من هذه الدراسة هو مقارنة فاعلية الطريقة التعليمية التقليدية، بطريقة التعليم المعتمد على الحالات في تدريس علم وظائف الأعضاء بين طلاب السنة الثانية بكلية التمريض.

طرق البحث: أجريت دراسة وصفية بحيث كانت عينة الطلاب هي العينة الضابطة نفسها، بحيث أجري لهم امتحان بعد كل عملية تدريسية. في الأولى، درس الطلاب علم وظائف الأعضاء للجهاز الهضمي بالمحاضرات التقليدية. وفي الثانية، درس نفس الطلاب علم وظائف الأعضاء للجهاز البولي بواسطة نفس المدرس بطريقة التعليم المعتمد على الحالات. استخدمت طريقة الامتحان بالاختيار من متعدد بعد كل فترة تدريسية وتمت مقارنتهما. وبعد انتهاء الفترتين، قيم الطلاب الطريقتين بتعبئة استبانة. واستعمل التحليل الإحصائي لتحليل النتائج.

النتائج: كان أداء الطلاب بالامتحان بعد تدريسهم بالطريقة التقليدية أفضل إحصائياً من أدائهم بعد تدريسهم بطريقة التعليم المعتمد على الحالات. وقد عبر أكثر من ثلثي الطلاب عن تحسن معلوماتهم الطبية بطريقة التعليم المعتمد على الحالات مقارنة بالطريقة التقليدية بالمحاضرات.

الاستنتاجات: وجد أن الأداء في الامتحانات بعد التعليم عن طريق المحاضرات أفضل إحصائياً، ولكن التغذية الراجعة من الطلاب أشارت إلى أن التعليم المعتمد على الحالات يمكن استعماله بديلا عن المحاضرات وقد يساعد على التحصيل المهاري، الأمر الذي يعد مهما في حل المشاكل المهنية أثناء العناية التمريضية.

الكلمات المفتاحية: التعليم المعتمد على الحالات; محاضرة تعليمية; طالب التمريض

Abstract

Objectives: Case-based teaching is a relatively new approach to teaching basic sciences. Although this technique has been used in medical teaching for many years, few attempts have been made to examine its efficacy for nursing students. The aim of this study was to compare the effectiveness of didactic and case-based teaching of physiology among second-year nursing students at our college.

Methods: A descriptive cross-over study was conducted, in which the students served as their own controls, as they were examined after each of two sessions. In the first session, the students were taught digestive physiology by traditional lectures. In the second session, the same students were taught renal physiology by the same instructor using a case-based technique. Multiple-choice questions were used to assess each student's comprehension after each session and compared. At the end of the two sessions, students evaluated the teaching method on a questionnaire. Paired t tests were used to analyse differences.

Results: The performance in tests was statistically significantly better after didactic lectures (mean, 17.53) than after case-based teaching (mean, 16.47) (two-tailed $p = 0.003$). However, 65–72% of students found that case-based teaching improved their knowledge about the topic better than lectures.

Conclusions: Significantly better examination performance was observed after didactic teaching, but the students' feedback indicated that case-based teaching could be used as an alternative to lectures and may facilitate skills acquisition, which is considered to be important in professional problem-solving during nursing care.

Corresponding address: Assistant Professor, Department of Physiology, College of Medicine, University of Dammam, P.O. Box 1982, Dammam 31441, Kingdom of Saudi Arabia.
E-mail: doctorfarrukhmajeed@gmail.com

Peer review under responsibility of Taibah University.

ELSEVIER Production and hosting by Elsevier

http://dx.doi.org/10.1016/j.jtumed.2013.12.005

Keywords: Case-based teaching; Didactic lecture; Nursing student

Introduction

Nurse educators struggle to find the best ways to prepare nursing students to care for patients in the increasingly complex health care environment. New nurses must be prepared to solve problems and think critically in order to provide high-quality care to patients, and they must be able to work collaboratively, analyse data, interpret results, think critically, draw reasoned conclusions and make complex decisions.[1] Early assessment and detection of declining health status and quick intervention are essential to a patient's recovery. Nurse educators assist their students in applying knowledge about nursing-related sciences and other disciplines to make independent decisions for comprehensive nursing care.[2,3] Preparing nursing students requires educators to use creative teaching strategies that engage the students in active learning, which increases their motivation, sharpens their thinking, deepens learning and strengthens collaboration in the classroom. In active learning, the higher thinking processes of students are stimulated.[4–6]

Conventionally, undergraduate students are taught in didactic lectures, practical exercises and tutorials, which are mainly passive teaching and learning methods and do not develop the problem-solving or reasoning skills of the students. Furthermore, there is hardly any involvement of students in the teaching–learning process. Although no single teaching method ensures a thorough understanding of a topic, various methods are being used in many institutes to reinforce lectures in teaching physiology, such as case-stimulated learning,[7] problem-based learning[8] and patient-centred learning.[9] In case-based learning, students are motivated to use clinical knowledge from real-life scenarios to solve problems. With this method, both students and faculty members contribute to discussions on identified learning issues.

Lectures are definitely a powerful method of delivering information to a large number of students quickly, but there has always been a need for an alternative to the traditional format in basic sciences education.[10–12] Case-based teaching is commonly used in medical and other health sciences courses, and has been used recently in nursing education.[10,11,13,14] Real cases that nurses might encounter in hospital are used to practice and apply basic scientific concepts in making clinical decisions and thinking critically in a patient-care scenario. By discussing a clinical case related to the topic taught, students understand the concept at a high order of cognition. This process encourages active learning and may have a more productive outcome.[5,15]

Another issue in teaching strategies is the monotony of lectures. Usually, the concentration level of students starts falling 10–20 min after the start of a lecture and improves slightly towards the end.[16,17] Some students like lectures, because the information is precise, to the point and all they have to do is listen. Didactic teaching remains the main teaching mode in many institutions, whereas various active learning methods, such as case-based, problem-based and team-based teaching and small group discussions, could also be used.

Despite numerous studies on case-based learning in various disciplines,[10,11,13,14] there is still not enough evidence of the efficiency of this method for undergraduate nursing students, as the results of the studies are diverse.[10,12,18–20] The purpose of present study was to determine any difference in the effect of lectures and case-based teaching on students' performance in examinations and to test whether nursing students found case-based teaching more enjoyable and more educationally stimulating than traditional lectures. To our knowledge, this is the first study to compare the effectiveness of case-based with didactic teaching for nursing undergraduate students in Kingdom of Saudi Arabia.

Materials and Methods

We conducted a descriptive cross-over study, in which the same students were their own controls, in the physiology department of our university in 2013. Nursing students enrolled in second-year anatomy and physiology at the nursing college were the study population. Of 96 students, 86 participated in the study.

The study protocol was approved by the ethics committee, and each participant gave informed consent.

The students were taught physiology in two sessions. In the first session, the instructor gave 5 h of lectures on digestive physiology, followed by a 2-h tutorial. The students' understanding of the topic was assessed from a multiple-choice questionnaire. For the second session, five case-based lectures on renal physiology were prepared and reviewed by a committee including a person from the nursing department. In this session, the same instructor used the case-based method over 5 h. Each session started with a case, followed by a 25-min student discussion about the physiology of the case. During the next 25 min, the instructor explained the concept, followed by a wrap-up session. This session was followed by a 2-h case-based tutorial with some prepared exploratory questions related to the case to be discussed in the group. The teachers were asked to address all the relevant points that came up in discussion prompts. At the end of the session, the students' understanding of the topic was assessed from a multiple-choice questionnaire, in which 30% of the questions tested cognitive skills from the case-based scenarios. To avoid any bias in the instructor's evaluation of performance, the instructor was unaware of which teaching method had been used.

After completion of each of these two teaching sessions, the students filled in a feedback form after the examination, to determine whether they agreed with 12 statements about the teaching method used on a five-point Likert scale. Examples of the statements are: "The case-based study is more helpful for understanding the topic than lectures." "This course helped me to improve my ability to think and solve problems rather than just memorize information." "This case-based course helped me to improve my understanding of the questions on the examination and to answer the quiz easily." The feedback form was developed from the National Commission for Academic Accreditation and Assessment