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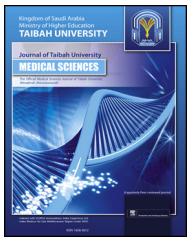

Educational Article

Importance of vertical integration in teaching and assessment of physiological concepts

Nazish Rafique, FCPS

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

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الملخص

أهداف البحث: في ظل النظام القائم للمناهج الجامعية, تم تدريس علم وظائف الأعضاء بالطريقة التقليدية غير المعتمدة على الحالات. يهدف هذا البحث لوضع وتنفيذ منهج وحدة الجهاز التنفسي يعتمد على الدمج الرأسي المتكامل للتعلم، والتقييم باستخدام منهجيات متعددة للتدريس. كما أنه يهدف إلى مقارنة نتائج التكامل الرأسي لتدريس وحدة الجهاز التنفسي مع الطريقة التقليدية للتدريس تمهيدا لتقييم جدوى وأهمية التكامل الرأسي.

طرق البحث: أنهى فريق تدريس وحدة الجهاز التنفسي الحالات السريرية, والمواضيع, والأهداف ذات الصلة, واستراتيجيات التعلم, والجدول وأدوات التقييم. وتم العرض والموافقة على هذه الوحدة من قبل مجمع أعضاء هيئة التدريس بقسم علم وظائف الأعضاء. وتم استخدام استراتيجيات متعددة للتعلم. تمت مقارنة نتائج الاختبار لوحدة الجهاز التنفسي المتكاملة رأسيا مع نتائج الطريقة التقليدية للوحدة التمهيدية لنفس المجموعة من الطلبة. كما وزعت استبانات لجمع ردود فعل الطلبة في نهاية الوحدة.

النتائج: أجاب ٩٩٪ من الطلبة بأن النهج المتكامل يجعل التعلم والفهم أسهل. كما أعرب ٩٠٪ من الطلبة عن أملهم أن تكون طريقة التدريس هذه مفيدة لهم مستقبلا في السنوات السريرية، وفضل ٩٢٪ من الطلبة استمرار النهج المتكامل في المستقبل. تشير مقارنة النتائج بأن نسبة النجاح ومتوسط النتيجة (٨٩٪ و٦٨,٥) كانت أعلى بوحدة الجهاز التنفسي المتكاملة رأسيا بالمقارنة بالوحدة التمهيدية غير المعتمدة على الحالات (٧٠٪ و٦١.٥).

الاستنتاجات: بناءا على التغذية الراجعة من الطلبة يمكن أن نستنتج بأن تدريس علم وظائف الأعضاء بواسطة النهج المتكامل رأسيا، يمكن أن يكون أفضل من الطريقة التقليدية غير المعتمدة على الحالات, حيث أنها تعزز اهتمام الطلبة وتسهل التعلم الهادف والعميق. لكن هناك حاجة للمزيد من الدراسات لمعرفة التأثيرات وأهمية استبدال منهج علم وظائف الأعضاء التقليدي بالمناهج المتكاملة رأسيا.

الكلمات المفتاحية: علم وظائف الجهاز التنفسي; المحاضرات التفاعلية باستخدام حالة محاكاة; السيناريوهات

Abstract

Objectives: Under the existing system of undergraduate curriculum, physiology teaching was done in a traditional non-case based manner. The objective of this research was to develop and implement a respiratory module which would incorporate vertically integrated learning and assessment using multiple teaching methodologies.

Methods: A respiratory modular team finalized the clinical cases, themes, relevant objectives, learning strategies, time table and assessment tools. The exam results of this Vertically Integrated Respiratory Module were compared with the results of traditionally delivered Introductory Module for the same group of students. Students' feedback questionnaire was also administered at the end of module.

Results: 99% of the students responded that integrated approach makes learning and understanding easy. 90 % of the students hoped that this mode of teaching would be helpful to them in future clinical years and 92% of the students favored the continuation of this integrated approach in future. Comparison of the results indicated that the passing percentage and the mean score (89% and 68.5) was higher in the Vertically Integrated Respiratory Module as compared to the non case based Introductory Module (70% and 61.5).

Conclusion: Based on the students feedback we may conclude that teaching physiology via vertically

Corresponding address: Assistant Professor, Department of Physiology, College of Medicine, University of Dammam, PO Box 2114, 31451, Kingdom of Saudi Arabia.

E-mail: nazishrafique@hotmail.com, nryahmed@ud.edu.sa

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integrated approach may be superior than traditional non case based teaching, because it enhances students interest and facilitates meaningful and deep learning.

Keywords: Case scenarios; Case stimulated interactive lectures; Respiratory physiology

Introduction

Medical education is changing rapidly, with more than half of American medical schools engaged in curricular reform.[1,2] The need for integration has been advocated in many reports on medical education. Many of these modifications focus on implementing horizontal and/or vertical curricular integration.[3]

Vertical integration is defined as the integration between the clinical and basic science sections of the curriculum. It can occur throughout the curriculum with the basic medical and clinical sciences beginning together in the early years of the curriculum and continuing until the later years. More emphasis may be placed on the basic medical sciences in the earlier years and on clinical sciences and the practice of medicine in the later years.[4]

Introduction of vertical integration may be considered as one of the major reforms to prepare better physicians for the next century.[5] Vertical integration between basic sciences and clinical medicine has been found to stimulate profound rather than superficial learning, and thereby results in better understanding of important biomedical principles.[6] Vertical integration improves motivation, enhances deep learning, prepares for lifelong learning, facilitates curricular reforms, enhances clinician's reflections on scientific practice and enhances scientists reflections on clinical application and research.[7]

Although the move towards vertical integration is gathering momentum world-wide. The process of change will be relatively difficult in institutions with established curricula mainly, because it needs to change the mindset of the faculty. Vertical integration brings more relevance and excitement in learning. To involve clinicians in preparation of basic medical science modules and vice versa is vital to develop vertical integration.[8] Negative faculty attitudes can present a significant barrier to integration and an open line of communication between basic science and clinical disciplines may combat the perception that basic sciences are irrelevant to clinical practice and encourage vertical integration.[9]

Vertically integrated learning is the need of the hour. In recent years such curricula have been employed by faculties of many medical schools throughout the world.[4, 6,19,20,21] WHO supports the integration of outcome and competency based strategies and student centered approaches in learning process.[10] Medical education has also been changing rapidly in Saudi Arabia and most of the medical colleges are now shifting towards innovative, integrated and problem based programs.[11] So our aim was to design and implement a vertically integrated respiratory module for teaching physiology in a modified way to the second year MBBS class at University of Dammam. This was an effort to eliminate the sharp boundaries between basic and clinical sciences in undergraduate teaching in Kingdom of Saudi Arabia.

Materials and Methods

Module designing

Team formulation

For the efficient delivery of the module a respiratory team was formed. Team was headed by a team leader and included highly relevant and dedicated team members. The entire faculty was oriented to the process of implementing integrated curriculum, and a series of the faculty development programmes were conducted in order to train the faculty to accept the evolving challenges in medical education. The learning objectives, clinical cases, themes, learning strategies, time table and assessment tools for the module were finalized after several meetings and discussions amongst the team members.

Designing the clinical scenarios

Construction of well-designed cases/problems that drive meaningful learning was considered crucial as these are the starting point for students' learning activities that largely impact on the quality of student learning. Attempts were made to ensure the vertical integration of the different topics of respiratory system. Clinical scenarios, covering most of the objectives related to respiratory physiology were designed after various meetings between the chairman of the department, and the team of respiratory module. While formulating these case scenarios special consideration was given to the Dolmans seven principles of effective case design, which include: relevance to the context of future professional practice, integration of basic and clinical concepts, stimulation of self-directed learning by encouraging students to generate learning issues and conduct literature searches.[12]

Module implementation

Teaching methods

Case based learning was incorporated in lectures and small group discussions in a modified way to improve students understanding, and to motivate them toward self-directed study. Following learning methodologies were used.

Case stimulated interactive lectures

This approach consisted of introduction of the case scenario at the beginning of the Lecture [Table 1], which provided opportunities for authentic, integrated problems to drive relevant learning and reduce the burden of factual information. Basic idea was to integrate basic and clinical concepts and help the students in understanding the pathophysiological basis of various respiratory disorders. Emphasis was given on the physiological mechanisms rather than on diagnosis and treatment.

At the end of each lecture the students were given predesigned high quality vertically integrated Short Answer questions(SAQS), which helped them in their self assessment [Figure 1].