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ORIGINAL ARTICLE

Teaching the basics of echocardiography in the undergraduate: Students as mentors[☆]



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KEYWORDS

Echocardiography;
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Abstract

Objective: To analyze the ability of medical students to incorporate the practical teaching of basic echocardiography planes using a peer mentoring design.

Methodology: Thirty-six medical students previously trained in obtaining echocardiography planes (mentors) taught the other 5th-year students ($n=126$). The teaching methodology included three stages: theory (online course), basic training (three 15h sessions of practical experience in ultrasound and at least 20 echocardiographic studies per mentor) and objective structured clinical assessment (OSCA), which scored the appropriateness of the basic ultrasound planes and the correct identification of 16 cardiac structures.

Results: The students' weighted mean score in the OSCA was 8.66 ± 1.98 points (out of 10). Only 10 students (8.4%) scored less than 5, and 15 (12.6%) scored less than 7. Fifty students (42%) scored 10 points. The most easily identified structure was the left ventricle in the short-axis parasternal plane, with 89.9% of correct answers. The most poorly identified structure was the mitral valve in the subxiphoid plane, with 69.7% of correct answers.

Conclusions: Peer mentoring-based teaching achieves an appropriate level of training in obtaining basic echocardiography planes. The training period is relatively short. The peer mentoring

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PALABRAS CLAVE

Ecocardiografía;
Educación médica;
Estudiantes como
mentores;
Mentoría paritaria

system can facilitate the implementation of teaching on basic aspects of ultrasound to a large number of undergraduate students.

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Enseñanza de las bases de la ecocardiografía en el pregrado: los estudiantes como mentores

Resumen

Objetivo: Analizar la capacidad de los alumnos de Medicina para integrarse en la enseñanza práctica de los planos básicos en ecocardiografía mediante un diseño de mentoría paritaria.

Metodología: Treinta y seis alumnos de Medicina previamente adiestrados en la obtención de planos en ecocardiografía (mentores) enseñaron al resto de alumnos de 5.º curso (n = 126). La metodología docente incluyó 3 etapas: teoría (curso *online*), entrenamiento básico (3 sesiones con 15 h de experiencia práctica en ultrasonidos y un mínimo de 20 estudios ecocardiográficos por mentor) y evaluación clínica objetiva estructurada (ECO) en la que se puntuaba la adecuación de los planos ecográficos básicos y la correcta identificación de 16 estructuras cardíacas.

Resultados: La puntuación media ponderada obtenida por los alumnos en la ECO fue de $8,66 \pm 1,98$ puntos (sobre un máximo de 10). Solo 10 alumnos (8,4%) obtuvieron una puntuación inferior a 5 y 15 (12,6%) inferior a 7. Cincuenta alumnos (42%) obtuvieron 10 puntos. La estructura más fácilmente identificada fue el ventrículo izquierdo en el plano paraesternal eje corto, con un 89,9% de respuestas correctas. La estructura peor identificada fue la válvula mitral en el plano subxifoideo, con un 69,7% de respuestas correctas.

Conclusiones: La enseñanza basada en la mentoría paritaria consigue un nivel de entrenamiento adecuado en la obtención de planos básicos en la ecocardiografía. El periodo de formación es relativamente corto. El sistema de mentoría paritaria puede facilitar la implantación de la enseñanza sobre aspectos básicos en ultrasonidos a un elevado número de alumnos de pregrado. © 2016 Elsevier España, S.L.U. y Sociedad Española de Medicina Interna (SEMI). Todos los derechos reservados.

Background

In current clinical practice, portable ultrasound devices are available for use at the patient's bedside. This availability helps integrate ultrasonography into the diagnostic process, which could be called "clinical ultrasonography".¹⁻³ This ultrasound modality focuses on basic and clinically relevant aspects without the need for a steep learning curve,^{4,5} facilitates the teaching of anatomy, helps with understanding the pathophysiology of organs and systems and improves the performance and reliability of physical examinations performed by students.⁶⁻⁸

The training of medical students in ultrasonography is being progressively implemented in various medical schools.^{3,7,9-18} However, the main limitations for its widespread teaching are a lack of professors and the time required for their training. A possible solution is the integration of students into the practical teaching of ultrasonography. Thus, after a small group of students have been trained, these students can then teach others, using what could be called "peer mentoring".¹⁹⁻²³

The aim of this study was to analyze the ability of medical students to incorporate the practical teaching of basic echocardiography planes and identify the most important cardiac structures using a peer mentoring design, with a subsequent assessment of its efficacy. The term "echocardiography" has been recently coined by the Spanish Society of Cardiology to refer to basic cardiac ultrasound examinations performed by the bedside with portable equipment. In echocardiography, four elementary planes are employed (parasternal long and short axes, apical four chamber and subxiphoid), and their objectives are well defined.²⁴

Methodology

Design

A prospective observational study was conducted with 126 fifth-year medical students who had prior training in basic abdominal ultrasonography,²⁵ in which an educational

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