

Methodology in the European higher education area for the Anatomy learning in the Health Sciences

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SUMMARY

Development of the European Higher Education Area is linked to the adoption of a new educational model. Thus, in the Health Sciences, basic science knowledge must be integrated with the clinical skills that students will require in their professional activity. The Anatomy and Embryology Teaching Investigation Group at our university (UGR-N-40-UCUA) designed a specific questionnaire to analyse specific items that affect Anatomy learning. It also developed a teaching methodology for the acquisition of anatomic knowledge, integrating theory and practice, including individual and collective tasks for students and leading to future self-learning. Analyses were performed in different groups of first-year students at the School of Medicine of Granada University, School of Nursing of Almería University and School of Physiotherapy of Jaén University. It was found that application of this teaching methodology achieved an improvement in two areas considered essential by these students, i.e. a better understanding of several aspects of the study subject, and greater satisfaction with their acquisition of anatomic and embryologic knowledge.

Key words: Medical Education – Gross Anatomy – European Higher Education Area –Curriculum – Health Sciences

INTRODUCTION

The Bologna process and the introduction of the ECTS credit system into the educational system has led to modifications in Health Science studies in Spain (Mérida, 2006). One of these changes is the requirement to correlate practical with theoretical knowledge. However, the wide range of subject contents and the inflexible structure of theoretical and practical lessons make this a difficult objective to meet (O'Neill, 2000; Steele et al., 2002). Novel teaching strategies are required that develop integration of basic and clinical knowledge, coordination and integration between theory and practice, and evaluation of the time spent by students in the learning process, among other aspects. Hence, an appropriate methodology must be developed for teaching in the Anatomy and Embryology Area, adapted to these new demands (Yates, 1999; McCrorie, 2000; Peck and Skandalakis, 2004). Teachers of Anatomy and Embryology Area at three Universities in Andalusia (Granada, Almería and Jaén) recently created a

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Teaching Investigation Group (*Grupo de Formación Docente UGR-N-40 de la Unidad de Calidad de las Universidades Andaluzas- UCUA*) supported by the Andalusian Government. In agreement with Graham (1999), our group considers that the quality of teaching is related to the involvement of students in the learning process and that their opinions are an important feed-back element for improving this quality (Pérez et al., 1986). However, the questionnaires usually administered by Universities follow an established model that does not address the specific characteristics of each knowledge area (Gil et al., 1999; McCrorie, 2000; López-Burillo et al., 2002).

With this background, our group has been engaged in a project to bring together practice and theory by the development of new teaching strategies and modified evaluation systems (Barrovecchio et al., 1998; Tavares et al., 2002) that take account of the large number of learning activities performed by students. Thus, we designed a questionnaire that contains specific items related to Anatomy learning, including questions on the application of the new teaching methodology. The objective of this questionnaire was to obtain useful information for teachers on: student opinions of teaching activities: the degree of learning of parts of the programme taught with the new methodology; and the satisfaction of students with the development of the subject.

MATERIAL AND METHODS

Study subjects were enrolled from among first-year students at the School of Medicine at Granada University (108 students), School of Nursing at Almería University (59 students) and School of Physiotherapy at Jaen University (55 students) during the 2005-6 academic year. The teaching material integrated basic and clinical concepts and used diagnostic images, anatomical models, clinical videos and dissection. The novel methodology was applied to the teaching of the Cardiovascular System topic. Work groups were developed and an intensive individual work programme implemented, with an emphasis on self-learning, understanding and self-evaluation (Miller et al., 2002; Brawer, 2006). Students completed a questionnaire with Likert scale (1-5) responses designed by specialist university teachers of Anatomy (Cabalin et al., 2002) (see Results). The questionnaire comprised three

Figure 1. Evaluation of different factors that can influence the understanding of Anatomy and Embryology and the development of teaching in this area. 1. Clinical application of acquired knowledge. 2. Clinical comments related to the programme. 3. Relationship between the subject and their future professional activity. 4. Relevance of teacher questions in the development of the lesson.

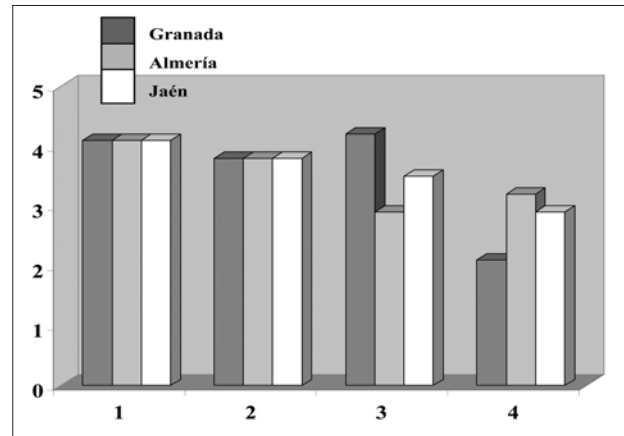


Figure 2. Evaluation of different aspects related to student satisfaction with the subject of Anatomy and Embryology. 1. Degree of satisfaction with the acquisition of Anatomic knowledge. 2. Teacher encouragement is important for learning motivation. 3. Satisfaction with Anatomic knowledge in relation to its clinical application. 4. General satisfaction with the subject.

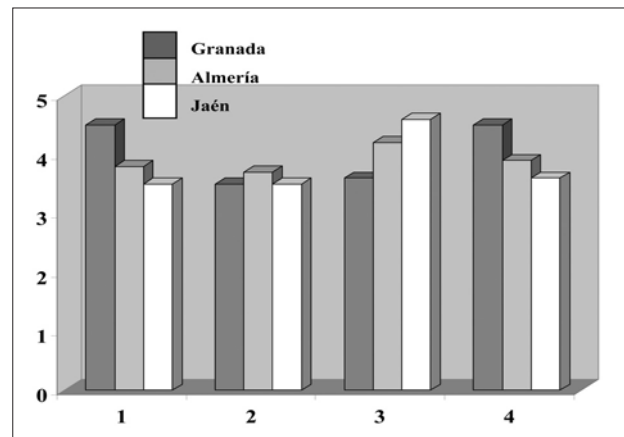
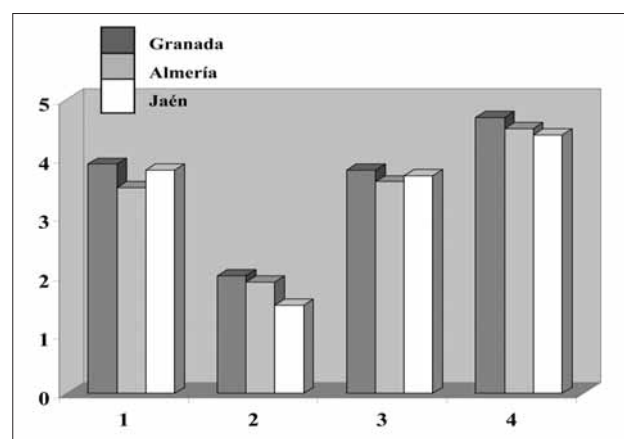


Figure 3. Evaluation of methodology applied to the Cardiovascular System topic. 1. Appropriate learning of this topic. 2. Learning difficulties with the Cardiovascular System in comparison with other topics (5=maximum complexity; 0= minimum complexity). 3. General evaluation of the teaching method. 4. Evaluation of the parts of the syllabus that the student would like to be adapted to this methodology (0=0%, 1=25%, 3=50%, 4=75%, 5=100%).



parts that addressed different aspects: 1) Factors that can influence Anatomy learning, specifically concerned with the applicability of their anatomical knowledge; 2) General evaluation of different subjects; and 3) Student satisfaction, including items on the novel methodology application. Results obtained were expressed as frequencies, percentages and means. The SPSS 12.0 statistical programme was used for the statistical analyses.

RESULTS

In order to determine the students' opinion of our teaching activity, the questionnaire evaluated both the importance of the subject presentation (data not shown) and factors that can influence their understanding and motivation (Section 1). Interestingly, these factors were rated differently by distinct groups of students. Medical students in Granada considered a previous explanation of the relationship between the subject and their future professional activity (Figure 1; item 3) to be very important (mean 4.3), a significantly higher mean score than that assigned by the Physiotherapy students in Jaen (3.4), which was in turn higher than the score of the Nursing students in Almeria (2.8). However, no significant differences among the three student groups were observed in relation to the clinical application of acquired knowledge (item 1), for which a mean score of 4.20 was assigned by the Medical students (Figure 2). No significant differences among groups were found with respect to the clinical comments related to the programme (item 2). A significantly lower score for item 4 (relevance of teacher questions in the development of the lesson) was assigned by the medical students in Granada versus the other groups, with scores of 2.1, 3.1 and 2.9 from Granada, Almería and Jaén Universities, respectively. The differences in these scores can be explained by the distinct teaching situations, since a single teacher was responsible for these subjects at Almería and Jaén Universities, whereas various teachers participated in the development of these subjects at Granada University.

Results also differed among the universities in the general evaluation of the different subjects in Anatomy and Embryology (Section 2). Thus, medical students at Granada University had a high level of satisfaction with their

acquisition of Anatomical knowledge (Figure 2; item 1), whereas students at the other two universities gave lower mean scores, although they were still positive (3.8 in Almería and 3.5 in Jaen Universities, respectively). The general satisfaction in relation to the subject was higher in medical students (item 4; mean 4.5) than in nursing and physiotherapy students. All three groups of students considered teacher encouragement to be important for learning motivation (item 2).

Finally, we evaluated the students' opinion of novel teaching methodology applied to the cardiovascular system. As shown in Figure 3, students consider that their learning in this topic was appropriate (item 1) and that learning difficulties were lesser than with other parts of the subject (item 2). Mean scores were 2,7, 2,5 and 2,3 in Granada, Almería and Jaén Universities, respectively (0= minimum complexity, 5 = maximum complexity). Students gave a positive evaluation of the teaching method (item 3). Importantly, students thought that this methodology should be applied to 70-100% of the subject (item 4).

CONCLUSION

This study demonstrates the importance that students assign to the association of basic with clinical concepts and to the clinical application of their knowledge or its relationship with their future professional activity. A teaching experience based on these factors was designed. Despite some discrepancies among student groups and the possible influence of different teachers, this new teaching methodology yielded better results and an improvement in two key aspects, i.e., there was a better understanding of the topics taught by this method and the students expressed satisfaction with its application. We highlight the positive response of students to the possibility of extending this experience to all subjects.

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