UNDERGRADUATE STUDENTS’ CONCEPTUAL CHANGE DURING A CARDIOVASCULAR COURSE IN MEDICINE

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BACKGROUND

Cumulation of knowledge and conceptual change are crucially important when trying to understand students’ learning processes and development towards medical expertise. It is also known that preconceived medical knowledge may either support or prevent conceptual change processes among undergraduate medical students. Conceptual change studies show that university level students can have misconceptions concerning core concepts in medicine, such as function of cardiovascular system 1.

The role of learning environment in supporting the development of medical expertise is essential. Problem based learning (PBL) environment is widely used in medicine. However recent studies have imposed increasing criticism towards the PBL method 2.

AIM

Purpose of this study is to investigate quality of concepts concerning students’ knowledge during a basic cardiovascular physiology PBL course.

METHOD

Study was carried out in spring 2008 during an integrated physiology course on Circulation, Respiration and Fluid balance. Two-thirds (63%, N= 93) out of 147 first- year medical and dental students took part in the study. Before and after the PBL course the students filled a questionnaire which included 12 quantitative multiple choice questions and made a qualitative figure drawing exercise concentrating on anatomy and function of human central blood circulation.

RESULTS

Based on multiple choice questions analyses, most students had initially a good preconceived knowledge of human blood circulation and the results still improved during the course [mean number of correct answers 8.1 (1.5 SD) and 9.3 (1.2 SD), respectively]. (Fig. 1).

Table 1. Correlation of the change in number of correct answers between the two study points to the number of correct answers in the pre-course and post-course tests (N= 93)

<table>
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<tr>
<th>Change in the number of correct answers</th>
<th>Correlation coefficient</th>
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<td>r= -0.720**; p= 0.000</td>
<td>r= 0.425**; p= 0.000</td>
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Our preliminary results of the pre-course qualitative drawing exercise indicated that 28% of the students had clear conceptual difficulties, 9% of them with misconceptions and 19% with inadequate concept of circulatory system. On the other hand, one-third (33%) had minor conceptual insufficiencies, whereas 39% showed unbiased understanding of human blood circulation.

CONCLUSION

Our data indicate that first-year medical and dental students have in average a good preconceived knowledge of human blood circulation. A six-week PBL course on human circulatory physiology increased the mean number of correct answers to multiple choice questions of blood circulation. Especially students with lower initial number of proper answers seemed to benefit most of the course, whereas students with high number of pre-course correct answers had less change in the amount of accurate answers. Evaluation of the influence of the student group characteristics on these results are ongoing.

A majority (61%) of first-year medical and dental students appear to have conceptual inadequacies in the field of human central blood circulation. A fair number of these students have clear misconceptions. On the other hand, substantial part (39%) of the participating students seem to have initially appropriate concepts of human circulatory system. The effects of PBL learning environment on the observed conceptual insufficiencies, especially on an individual case level, remain to be studied.