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THE USE OF AN EDUCATIONAL GAME TO INTEGRATE THE PHYSIOLOGY OF SINAPSES, MUSCLE CONTRACTION AND AUTONOMOUS NERVOUS SYSTEM: PERCEPTION OF STUDENTS.

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Abstract

Educational games may increase student's motivation and engagement. In order to help students to integrate their knowledge about the physiology of synapses, muscle contraction and autonomous nervous system (ANS), we use an educational game in physiology classes. The aim of this study was to evaluate the perception of students about this educational game.

Key words:

synapses, muscle contraction, autonomous nervous system (ANS)

Introduction

- Educational games may increase students' motivation and engagement.
- In physiology classes of Dentistry course of FOP – UNICAMP, it has been used an educational game to help students to integrate their knowledge about the physiology of synapses, muscle contraction and autonomous nervous system (ANS).
- The objective of this project is to present this game and evaluate students' perceptions about it.

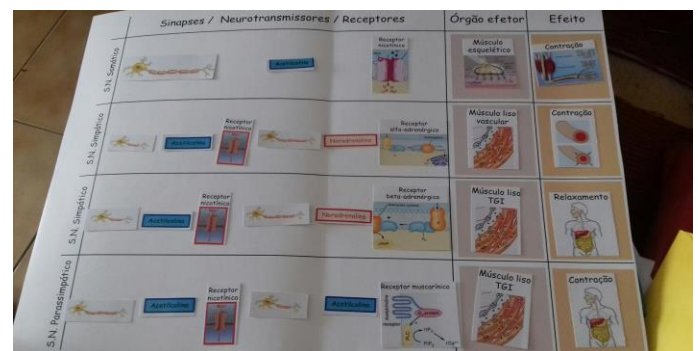
Methods

After having lectures about synapse, muscle contraction and ANS, the students received questions to discuss and answer. Each group received a game, and was instructed to fill in the columns with the chips correctly. During this activity, the students should remember and apply their knowledge about the diversity of receptors for neurotransmitters in the body, the diversity of neurotransmitter effects depending on the subtype of activated receptor, the diversity of the synapses in the somatic and autonomic nervous system. When the group finished filling the table, Monitors evaluated the answers. If there were mistakes, the students had to find and correct them. The institutional ethics committee (protocol # 033/2015) approved this study. Students of the first year of the Dentistry undergraduate course at Piracicaba Dental School, University of Campinas, Brazil, participated in this study.

Table 1. Examples of questions used in educational game activity.

1	In the assembled puzzle, it can be shown that the same transmitter triggers opposing actions on muscle tissue. Describe this situation in the puzzle, and explain why this occurs.
2	In the assembled puzzle, compare the morphology of the synapses of a neuron with the skeletal muscle, and of a neuron and smooth muscle. Describe the observed morphological differences and discuss how these morphological features are related to differences in synaptic transmission...

Figure 1. Educational game.



Results and Discussion

Of the 81 students enrolled in the course, 74 answered the question to evaluate the educational game. With regard to the reasons why the game contributed to the improvement of learning, some students presented more than one reason, and others did not present any (N = 3), only answering yes or no. Because of this, the sum of the justifications does not correspond to 74 answers.

In order to analyze students' perceptions about the educational game, in a later class, the teacher asked them to answer the question: "In the last practical class of physiology you used a puzzle about synapse, SNA and muscle contraction. Did the use of the puzzle improve in your learning? Why?".

For 74 students, the educational game helped in learning, because it made the content more concrete, the class was more dynamic, and there was more interaction among the students.

Conclusions

These results, although preliminary, seem to be in agreement with the data of the literature showing that educational games can improve learning.