

Misconceptions about the menstrual cycle among students of the teaching major of the integrated study of biology and chemistry

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ABSTRACT

A large number of scientific articles shown that misconceptions about the menstrual cycle are widespread in different populations and that the level of education has no significant effect on this phenomenon. The most common misconceptions are that that ovulation occurs in the middle of the cycle or that ovulation occurs on the fourteenth day of the cycle. It was found that the recorded misconceptions origin from the representation of the 28-day menstrual cycle that is present in all educational materials, without exception. Despite the solution found, the teaching material did not change. The aim of this research was to determine the presence of misconceptions about the menstrual cycle among students of the Integrated undergraduate and graduate programme Biology and Chemistry Education and their ability to determine the day of ovulation in a cycle that does not last 28 days. Furthermore, another aim was to compare the results of the university students with the results of a previously conducted research on a sample of high school students in Zagreb, published in 2018. The research was conducted on a sample of a total of 98 students in a period of six years, from 2012 to 2017. The results show that the proportion of students who accurately determined the day of ovulation is small and not significantly higher than the results achieved by high school students, and that the proportion of misconceptions in their explanations is very high. Furthermore, results show that, despite repeated teaching about the menstrual cycle or perhaps because of teaching with the help of inappropriate visual material, the occurrence of misconceptions is more pronounced among university students than among high school students.

Key words: *menstrual cycle; misconceptions; teaching*

INTRODUCTION

Ideas or conceptions that are not in accordance with scientific knowledge are called misconceptions (Yip, 1998), and according to the time of their creation, they can be divided into misconceptions created before teaching and misconceptions created during teaching. Recognizing already adopted misconceptions is sometimes quite difficult, and recognizing misconceptions represents the biggest challenge for teachers (Lukša et al., 2013). The existence of misconceptions about the menstrual cycle among primary and secondary school students in Croatia has already been proven several times (Lukša et al., 2013; Sirovina and Kovačević, 2018), and possible solutions have been shown (Sirovina and Kovačević, 2018). Despite this, the materials prepared for students in Croatian schools, i.e. textbooks, workbooks and other teaching materials, still contain outdated solutions (Balta and Škrtić, 2020; Krstanac et al., 2014; Lucić et al., 2021; Lukša and Mikulić, 2014). The aim of this research is to determine the ability of students of the integrated undergraduate and graduate programme Biology and Chemistry Education to determine the day of ovulation in menstrual cycles of different durations and the occurrence of misconceptions about the menstrual cycle among them. In addition, we want to show the differences in the mentioned abilities between the university students and high school students whose abilities were investigated a few years ago (Sirovina and Kovačević, 2018).

METHOD

The research was conducted on a sample of a total of 98 students in a period of six years, from 2012 to 2017. Students had to solve a task that consisted of two parts. The first part of the task was to determine the day of ovulation in a menstrual cycle that lasted 25 days, and in the second part of the task, you had to explain your solution in order to detect misconceptions (appendix 1). Furthermore, the obtained data, i.e. the students' answers, were compared with part of the data taken from the research conducted by Sirovina and Kovačević (2018). Statistical analysis was performed using the StatisticaTM 14 program (StatSoft GmbH, Germany). The difference was determined by the χ^2 test and the Psychometrica online calculator (Lenhard and Lenhard, 2014) was used to calculate the effect size.

RESULTS

The results show that the proportion of students who accurately determined the day of ovulation is small (21 %) and not significantly higher than the results achieved by high school students ($p = 0.102$). The proportion of misconceptions in university student explanations is very high. Furthermore, results show that, despite repeated teaching about the menstrual cycle or perhaps because of teaching with the inappropriate visual material, the occurrence of misconceptions is more pronounced among university students (46,43 %) than among high school students (19,01 %).

DISCUSSION, CONCLUSIONS AND DIDACTIC SIGNIFICANCE

Although research shows that there are firmly established misconceptions about the menstrual cycle in different populations of people (Beausang and Razor, 2000; Koff et al., 1990; Lukša et al., 2013; Lukša et al., 2016; Sirovina and Kovačević, 2018), the solution that is offered after the research conducted by Sirovina and Kovačević (2019) has still not found its way to textbooks or other working materials. The results of this research, which showed that students of the Integrated undergraduate and graduate programme Biology and Chemistry Education are not significantly more capable of determining the day of ovulation than high school students. Large part of them adopted misconceptions about the menstrual cycle, should emphasize the problem once again and guide teachers, editors and textbook publishers towards solving the problem with a small step forward from using the classic graphic display of the menstrual cycle of 28 days, that is, using a picture or film that shows cycles of different durations.

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