Factors Influencing Medical Informatics Examination Grade – Can Biorhythm, Astrological Sign, Seasonal Aspect, or Bad Statistics Predict Outcome?

Mladen Petrovečki, Dario Rahelić1, Lidija Bilić-Zulle, Vjekoslav Jeleč1
Department of Computer Science, Rijeka University School of Medicine, Rijeka; and 1Dubrava University Hospital, Zagreb, Croatia

Aim. To investigate whether and to what extent various parameters, such as individual characteristics, computer habits, situational factors, and pseudoscientific variables, influence Medical Informatics examination grade, and how inadequate statistical analysis can lead to wrong conclusions.
Methods. The study included a total of 382 second-year undergraduate students at the Rijeka University School of Medicine in the period from 1996/97 to 2000/01 academic year. After passing the Medical Informatics exam, students filled out an anonymous questionnaire about their attitude toward learning medical informatics. They were asked to grade the course organization and curriculum content, and provide their date of birth; sex; study year; high school grades; Medical Informatics examination grade, type, and term; and describe their computer habits. From these data, we determined their zodiac signs and biorhythm. Data were compared by the use of t-test, one-way ANOVA with Tukey's honest significance difference test, and randomized complete block design ANOVA.
Results. Out of 21 variables analyzed, only 10 correlated with the average grade. Students taking Medical Informatics examination in the 1998/99 academic year earned lower average grade than any other generation. Significantly higher Medical Informatics exam grade was earned by students who finished a grammar high school; owned and regularly used a computer, Internet, and e-mail ($p \le 0.002$ for all items); passed an oral exam without taking a written test ($p=0.004$), or did not repeat the exam ($p<0.001$). Better high-school students and students with better grades from high-school informatics course also scored significantly better ($p=0.032$ and $p<0.001$, respectively). Grade in high-school mathematics, student's sex, and time of year when the examination was taken were not related to the grade, and neither were pseudoscientific parameters, such as student zodiac sign, zodiac sign quality, or biorhythm cycles, except when intentionally inadequate statistics was used for data analysis.
Conclusion. Medical Informatics examination grades correlated with general learning capacity and computer habits of students, but showed no relation to other investigated parameters, such as examination term or pseudoscientific parameters. Inadequate statistical analysis can always confirm false conclusions.

Key words: astrology; culture; data interpretation, statistical; education, medical, undergraduate; educational measurement; medical informatics; occultism; students, medical