

ORAL PRESENTATION

Effect of skin color on the pulse oximeter measurement of oxygen saturation in humans

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Introduction: To test the hypothesis that the pulse oximeter will show a higher oxygen saturation compared to the real value in subjects with darker skin tones compared to lighter ones, because it was reported that due to the false reading of pulse oximeter dark skin patients were not treated properly during Covid-19. Thus, we aimed was to measure hemoglobin oxygen saturation with a pulse oximeter in healthy students of different skin colors.

Methods: 42 (30 women and 12 men), aged 18-37, healthy Hungarian and foreign students of Semmelweis University, Faculty of Health Sciences participated in the research. The heart rate and oxygen saturation were measured with a portable, finger-clipped pulse oximeter, according to the protocol, on the index finger of the left hand. We took a photo of the students' fingers against a white background, based on which the skin color was evaluated according to the Fitzpatrick scale. In addition, the students filled out a questionnaire assessing a three-level general health condition (1: no symptoms; 2: mild complaints; 3: severe complaints) and a six-level general physical condition assessment (1: no physical activity; 6: 6 per week/day) Who.

Results: 83.3% of the students felt healthy at the time of the measurement. 83.3% of students are doing physical activity regularly. There was a negative, weak relationship between Fitzpatrick scale value and oxygen saturation ($\rho(25)=-0.318$; $p=0.04$).

Conclusions: The data of this study showed that the pulse oximeter did not measure higher oxygen saturation in healthy individuals with darker skin color compared to those with lighter colors. Importantly, our results question the conclusions of previous reports that skin pigmentation influenced the oxygen saturation measured by the pulse oximeter and thus the care of Covid-19 patients.

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