

## ORIGINAL RESEARCH

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## EVALUATING VIRTUAL REALITY CYBERSICKNESS IN MEDICAL STUDENTS USING THE MSSQ AND SSQ SCORES

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**Introduction:** Simulation is a fundamental aspect of healthcare education. Developing effective simulation strategies. Virtual Reality (VR) is crucial for providing a transitional stage between theoretical knowledge and practical patient treatment. Despite the fact that improving the quality of a simulated scenario is beneficial in educational terms, the presence of cybersickness remains one of the main challenges. The susceptibility of some students to cybersickness during VR sessions presents a challenge as we explore the potential integration of VR programs. The aim of this study was to evaluate the capacity of Motion Sickness Susceptibility Questionnaire (MSSQ) to predict cybersickness.

**Methods:** This Cross-sectional exploratory prospective study evaluated seventy-nine medical students in their first and second year of studies. Susceptibility to motion sickness was assessed using the MSSQ. Participants underwent two virtual reality sessions, each lasting 30 minutes. Additionally, the Simulator Sickness Questionnaire (SSQ) was applied immediately after each session to assess participants' symptoms of motion sickness.

**Results:** A total of 79 students participated in the study, with an average age of 25 years. The majority of participants were female (59.49%) and had no prior experience with virtual reality (97.46%). Additionally, 50.63% of participants regularly wore prescription glasses. Self-reported motion sickness susceptibility varied among participants: 43.04% reported no susceptibility, 40.51% reported slight susceptibility, 12.66% reported moderate susceptibility, and 3.80% reported high susceptibility. The average MSSQ score was 10.57. Following the first VR session, post-session SSQ scores for nausea were as follows: negligible (56.96%), minimal (13.92%), concerning (20.25%), and severe (8.86%). Scores for oculomotor were as follows: negligible (48.10%), minimal (16.46%), concerning (18.99%), bad (16.46%). Scores for disorientation were as follows: negligible (55.70%), significant (20.26%), bad (24.05%). In the second virtual reality session, nausea scores remained predominantly negligible (59.49%), with lower percentages in other categories. Oculomotor and disorientation scores exhibited similar results across sessions.

**Discussion:** The MSSQ estimates an individual's susceptibility to motion sickness and allows individuals to be classified as having low, moderate, or high susceptibility [1]. However, in other studies, the MSSQ did not predict cybersickness's intensity [2]. The other questionnaire we used in this study was the SSQ, and this one includes evaluation items that consider various circumstances leading to cybersickness [3].

In our study we compared the results obtained between MSSQR and SSQ, and the results showed us that the 3

participants with the highest scores obtained in the MSSQR questionnaire scored 0 on both occasions they answered the SSQ questionnaire.

**Ethics statement:** Authors confirm that all relevant ethical standards for research conduct and dissemination have been met. The submitting author confirms that relevant ethical approval was granted, if applicable

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