Determining the Severity and Prevalence of Cybersickness in Virtual Reality Simulations in Psychiatry

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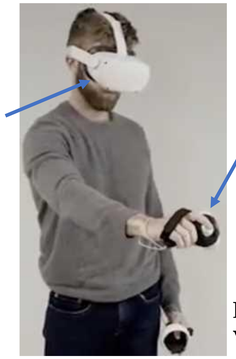
Introduction

Head-mounted display (HMD) → To present a 3D virtual environment



Handheld controllers → To perform tasks in simulations

Fig 1. Immersive Virtual Reality (VR)

- **Increased popularity** in healthcare education
- Practice skills in a **safe and authentic** environment
- **Cybersickness** experienced by 20 – 95% users

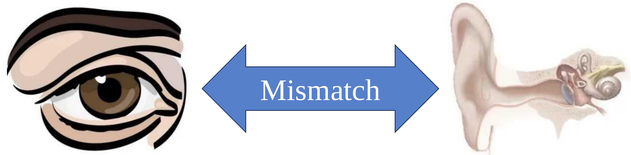
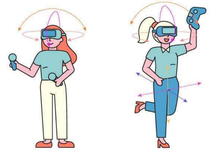


Fig 2. Sensory Conflict Theory

- Past studies: standing or sitting, the role of head movements, visual system, and time of VR exposure versus cybersickness
- Nausea symptoms > Oculomotor disturbance (Ciazynska et al., 2022)

Objective

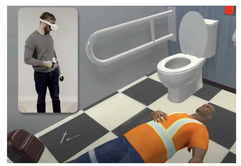


Degree of Physical Movement

Cybersickness

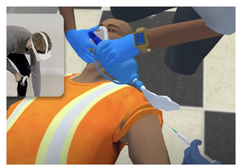
Methods

Opioid Overdose Response Training (OO)

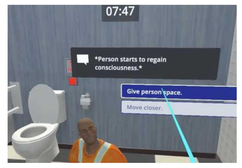


1. Assess the situation

2. Check for signs of overdose



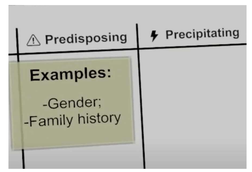
3. Administer treatment



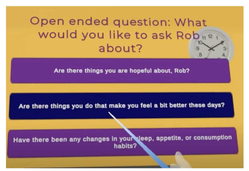
4. Provide support

- **High level of mobilization**
- **Standing Position**

Suicide Risk Assessment Training (SRA)



1. Learn core concepts in pre-briefing



2. Perform interactive assessment

3. De-brief with mentor

- **Moderate level of mobilization**
- **Seated/ Standing Position**

Simulator Sickness Questionnaire (SSQ)

Headache
Eye strain
Dizziness
⋮

16 Adverse Side Effects → Total raw SSQ score → **Nausea**, **Oculomotor**

Overall "slight" cut-off score = 16

4-Point Scale
- 0 = None
- 1 = Slight
- 2 = Moderate
- 3 = Severe

Pre-training survey

- Reported "moderate" or "severe" on any of the 16 SSQ items => Exclude
- Pre-existing medical conditions
- Meals consumed on training day

Training

- OO
- SRA

Post-training survey

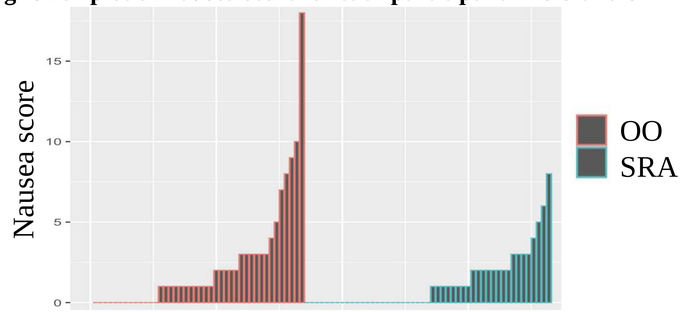
- Evaluate effects due to VR simulations

Results

Fig 3. Table of summary statistics and ANOVA tests results

Training	OO (N = 42)	SRA (N = 49)	ANOVA P-values
Mean SSQ			
Total	4.59 (SD = 5.81)	3.10 (SD = 3.48)	0.134
Nausea	2.38 (SD = 3.51)	1.20 (SD = 1.74)	0.0415*
Oculomotor	2.21 (SD = 2.82)	1.90 (SD = 2.11)	0.543

Fig 4. Bar plot of Nausea score for each participant in OO and SRA



Conclusion

Nausea in OO ⟷ Degree of Physical Movements

≈ Oculomotor symptoms ⟷ ≈ Visual demands

Balance educational benefits and user comfort

Future directions

Explore long-term learner engagement and skill retention

References

Ciazynska J, Janowski M, Maciaszek J. Effects of a Modern Virtual Reality 3D Head-Mounted Display Exergame on Simulator Sickness and Immersion Under Specific Conditions in Young Women and Men: Experimental Study. JMIR Serious Games. 2022;10(4):e41234