Virtual Reality (VR) Improves Pressure Pain Perception: A Prospective, Crossover Study

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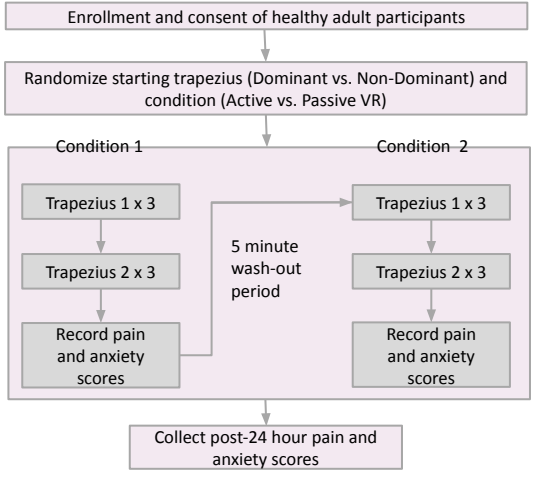
Background

- Inadequate pain management has been found to adversely affect procedural outcomes.[1]
- Virtual reality (VR) has been shown to be an effective tool for alleviating pain and anxiety.[2]
- This study investigates the difference between actively playing a VR game versus passively watching VR on pressure pain threshold (PPT), pain, and anxiety.

Methods



Figures

Figure 1. PPT assessed with algometer

	Initial scores		Post-24 hour recall scores	
	Active VR -Passive VR	P	Active VR -Passive VR	P
Pain	**-0.37**	**0.006**	0.49	0.39
Anxiety	-0.15	0.32	**-0.24**	**0.04**

Figure 2. Active vs. Passive VR

Figure 3. VR Game "Pebbles the Penguin" developed by Chariot

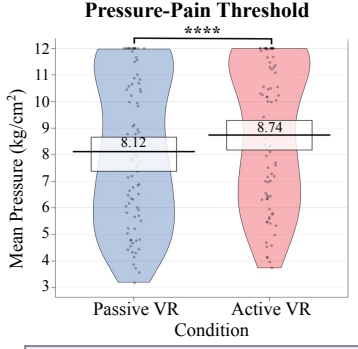


Figure 4. Mean Differences in Pressure Pain Threshold (** p ≤ 0.0001)**

Results

- Subjects underwent both Active and Passive VR conditions and 82 participants were included in the final analysis.
- Active VR intervention tolerated higher pressure than Passive VR intervention by 0.62 units.****
- Initial pain scores were 0.37 units** lower and initial anxiety scores were 0.24* lower for Active VR compared to passive VR.
- Post-24 hour recalled pain and anxiety scores showed no significant difference between Active and Passive VR.

Significance: *p ≤ 0.05, ** p ≤ 0.01, ***p ≤ 0.001, ****p ≤ 0.0001

Discussion

Why is this important?	VR has been shown to be effective as a distraction from pain, but this study focused on the difference between active and passive VR.
Future directions	Future research will assess the integration of this technology into routine medical procedures.
Conclusions	Playing an active VR game improved pain and anxiety scores right after pressure pain stimulus.

References

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2. Caruso TJ, George A, Menendez M, De Souza E, Khoury M, Kist MN, Rodriguez ST. Virtual reality during pediatric vascular access: A pragmatic, prospective randomized, controlled trial. Paediatr Anaesth. 2020 Feb;30(2):116-123. doi: 10.1111/pan.13778. Epub 2019 Dec 19. PMID: 31785015.