

Feasibility and Acceptability of Virtual Reality Biofeedback Integrated into Intensive Outpatient Pediatric Chronic Pain Treatment

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ABSTRACT

Objective: To examine the acceptability and feasibility of VR biofeedback delivered as part of an intensive outpatient pediatric pain program (IOPPP).

Method: Patients enrolled in the program were invited to participate in VR biofeedback sessions and provide input via satisfaction and feedback surveys.

Results: Participants reported high feasibility, high acceptability, and overall positive sentiment towards the VR biofeedback sessions.

Conclusions: The VR biofeedback intervention demonstrated high acceptability and feasibility when integrated into an IOPPP. Addressing logistical barriers may help to improve enrollment and retention rates.

INTRODUCTION

Biofeedback therapy is an empirically supported intervention for chronic pain whereby patients are taught to self-regulate physiological processes to alleviate symptoms of pain.

Virtual reality (VR):

- Is a novel modality for delivering biofeedback
- May be more engaging for teens²
- Has yet to be implemented within an IOPPP

Research Aim: To evaluate the acceptability and feasibility of implementing respiratory biofeedback delivered via VR as an adjunct to an intensive outpatient pediatric pain program (IOPPP). Our IOPPP centers on providing behavioral/rehabilitation therapies for pain management and the VR sessions will be integrated into this program.



Image from 123rf.com

METHODS

Inclusion Criteria:

- Eligible if aged 13-18 years and enrolled in our IOPPP. Excluded if history of seizures/ epilepsy.

VR Biofeedback Intervention:

- 15-20 min VR biofeedback sessions 2 days per week during the 4-week IOPPP
- Participants completed a satisfaction survey after each VR session and at the end of the program.

Measures/Analyses:

- Feasibility was defined as: $\geq 60\%$ of eligible patients enrolling; $\geq 60\%$ of participants completing $\geq 80\%$ of VR biofeedback sessions
- Functional Disability Inventory (FDI) - 15 item self report survey completed at pre- and post-intervention. Analyzed via paired sample t-test.
- Summarized open-ended responses to satisfaction and feedback survey.

PARTICIPANTS

Of 8 eligible patients:

- 3 declined participation (citing scheduling conflicts or disinterest)
- 5 enrolled (i.e., 63% recruitment rate)

Enrolled participants were:

- Ages 13-18 years, Mean = 15.2 ± 1.5
- 100% female
- 60% self-reported as Non-Hispanic White
- 40% self-reported as Hispanic or Other

Out of 5 enrolled participants:

- Four participants (80%) completed $\geq 80\%$ of VR biofeedback sessions
- 1 completed 3 sessions before withdrawing, citing schedule conflicts

RESULTS

On average, participants reported high satisfaction with each VR biofeedback session and the overall VR program. All participants agreed that:

- The sessions were easy to follow, appealing, and enjoying
- They would do the VR biofeedback again

In open-ended responses, most participants reported:

- The sessions were “relaxing” and/or “calming”
- They liked the “scenery/ visuals” and “music/ sound effects”
- They disliked some of the “talking”

Table 1. Average (mean) ratings on acceptability questionnaire

Question:	Session Specific Feedback								VR Program Feedback
	1	2	3	4	5	6	7	8	
The session was too long.	1.8	1.4	1.4	2.0	1.8	1.8	1.5	1.5	
The session was too short.	2.0	1.6	1.8	1.8	1.8	1.8	1.8	1.5	
The VR made me feel dizzy/light-headed.	1.3	1.6	1.4	1.8	1.8	1.5	1.5	1.5	
The session was easy to follow.	4.6	4.4	4.2	4.3	4.3	4.3	4.5	4.5	
Overall, I liked this session.	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.5	
The VR sessions met my approval.									4.5
The VR sessions were appealing to me.									4.5
I liked the VR sessions.									4.5
I would do the VR sessions again.									4.5
Note: Rating scale 1=Completely disagree, 2= Disagree, 3=Neither agree nor disagree, 4= Agree, 5= Completely Agree									

Preliminary Effect on Functional Disability:

Paired-sample t-test indicated a significant decline in FDI scores from the first to last VR session, $t(3)=5.40$, $p = .01$.

CLINICAL IMPLICATIONS & FUTURE RESEARCH

- VR biofeedback therapy demonstrated acceptability, feasibility, and preliminary efficacy when integrated into an IOPPP.
- Addressing logistical barriers (e.g., scheduling) may help to improve enrollment and retention rates in future work.
- Future research should recruit larger, more diverse samples and examine impact on other outcomes.