HIGH SCHOOL VIRTUAL REALITY EXERCISE FOR IMPROVING HEALTH AMONG CHILDREN WITH DISABILITIES: FEASIBILITY STUDY

Poster #

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Background

- Children have busy daily schedules, making school an ideal setting for promoting health-enhancing exercise behavior. However, children with mobility disabilities have limited exercise options to improve their cardiorespiratory fitness and cardiometabolic health.
- People with disabilities are ~3 times more likely to have cardiometabolic disease in early adulthood compared to people without disabilities.

Project Aims

- Test the feasibility of implementing a virtual reality (VR) exercise program for children with mobility disabilities from a high school setting.

Study Design

- Pre to post trial single-group design with a 6-week exercise intervention conducted at a high school.
- 10 Children with disabilities were enrolled from the high school. Five participants chose to exercise at school (55.6%), and four participants (44.4%) chose to exercise at home. One person dropped out. The mean age of the nine participants was 17 ± 0.6 years (six males / three females).
- The exercise prescription was three 25-minute sessions per week at a moderate intensity, using a head-mounted virtual reality display (Meta Quest 3). School exercise sessions were supervised by research staff. Home exercise sessions were performed autonomously.
- Several feasibility metrics were recorded, including exercise attendance, exercise minutes, adverse events or problems, and potential outcome estimates for health-related fitness (walking endurance and hand-grip strength). The study also included a qualitative evaluation of critical implementation factors and potential benefits for participants that were not included in the study measures. Outcomes were descriptively analyzed, and t-tests were used as appropriate.

Thematic Analysis

Four themes were identified:

1. Gaming at school aided well-being
2. Increased energy levels throughout the program
3. Supervision was necessary for safety and success
4. School-resources are critical for implementation

Results

- Total mean moderate-exercise (ME) mins across the six weeks was 213 ± 136 (range 0-377 mins). Mean ME per week was 35.5 ± 22 mins (17.7 ± 11 mins per a single session).
- Mean attendance was 61.1% (both groups).
- Attendance was higher among school exercisers (83.3% attendance; mean sessions attended 15 ± 2; 95% CI=13-18) compared with home exercisers (26.7% attendance; mean sessions attended 4.8 ± 4; 95%CI=-1-11), and this was statistically significant (p-value=<0.001; mean difference=10.7 sessions).
- Mean total ME mins was nearly 2x higher in volume for school-exercisers (279 ± 55 mins; 95% CI=212-347) vs home-exercisers (131 ± 170 mins; 95%CI=-140-401)

Community Impact

- The program is still being continued for students at the high school
- The Trussville (another city) community school system met with the investigators and developed their own community programming for children with special needs
- A UAB news article was published about the project, which is being taken one level higher and receiving another news article from the nationwide Children's network. The goal of this article is to network with other Children's Hospitals to spread this program to other communities.

Conclusions

- This study identified factors to inform an optimal protocol for implementing a high school-based virtual reality exercise program for children with disabilities.
- Study findings demonstrated that moderate exercise at school is feasible using VR.
- Simply providing children with VR exergaming technology at home, without supervision from staff, will not successfully engage them in exercise.
- VR exercise is safe for children with disabilities.
- Investigation is needed to determine if 54 minutes per week of moderate-intensity exercise is capable of improving cardiometabolic or cardiorespiratory health.

References

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