




The Impact of Virtual Reality Games on Reducing Motor and Cognitive Disorders in Children with Autism Spectrum: A Meta-Analytical Review

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1. Round 1

1.1 Reviewer 1

Reviewer:

Introduction, Paragraph 1: The sentence "This disorder includes a wide range of neurodevelopmental issues such as Asperger's syndrome and autism" could benefit from a more current reference to the DSM-5, which no longer uses Asperger's syndrome as a distinct diagnosis. It would be more accurate to refer to these conditions as part of the Autism Spectrum Disorder (ASD).

Methods and Materials, Search Strategy: In the search strategy, it is stated that "Two researchers collaborated to develop and execute the search strategy." However, there is no mention of how disagreements were resolved. Please specify the method used to resolve any discrepancies between researchers during the selection process.

Findings and Results, Data Collection: The statement "The final dataset earmarked for analysis in the study was corroborated by two researchers" needs more detail on how the corroboration was done. Did both researchers independently extract the data, and was there a measure of inter-rater reliability?

Table 1, Articles Used in the Present Study: The table lacks details on the sample sizes of the studies included. Including sample sizes would help in understanding the weight and significance of each study in the meta-analysis.

Results, Table 3: The effect size estimates for individual studies are given, but there is no discussion on the heterogeneity of these studies. It would be beneficial to include a measure of heterogeneity (e.g., I^2 statistic) to provide context on the variability among study results.

Discussion, Paragraph 3: The discussion mentions the variability in the efficacy of VR games based on individual differences among children with ASD. However, it does not elaborate on how these differences were accounted for in the meta-analysis. Please discuss any subgroup analyses or moderator analyses conducted.

Author revised the manuscript and uploaded the updated document.

1.2 Reviewer 2

Reviewer:

Abstract: The abstract lacks a statement about the limitations of the study. Including a brief mention of the study's limitations in the abstract would provide a more balanced overview of the findings.

Introduction, Last Paragraph: The introduction ends without a clear statement of the study's objectives. A concise statement of the research aims at the end of the introduction would enhance clarity.

Methods and Materials, Inclusion Criteria: The inclusion criteria mention "various forms of VR technologies including desktop setups or mobile devices." It would be helpful to specify whether these different forms were analyzed separately or together, as they might have different impacts.

Discussion, Paragraph 2: The sentence "Factors such as the severity of symptoms, personal interests, and prior exposure to technology can significantly influence outcomes" needs supporting references. Adding citations to studies that highlight these factors will strengthen the argument.

Methods and Materials, Data Analysis: The data analysis section states that SPSS version 28 was used, but it does not specify the statistical tests conducted. Please provide details on the specific statistical methods used for the meta-analysis.

Results, Paragraph 2: The phrase " $P=0.684$ " is mentioned without context. Clarify what this p-value refers to (e.g., overall effect size) and ensure that the interpretation of the p-value is clearly stated.

Table 2, Effect Size of Articles: The table mentions a 95% prediction interval but does not explain its relevance. Please include a brief explanation of the prediction interval and its importance in the context of this study.

Discussion, Conclusion: The conclusion should include a discussion on the practical implications of the findings for practitioners working with children with ASD. This would help bridge the gap between research and practice.

Methods and Materials, Study Selection: The study selection process would benefit from a flowchart (PRISMA diagram) to visually represent the number of studies screened, assessed for eligibility, and included in the meta-analysis.

Ethics Considerations: The ethics considerations mention adherence to the Helsinki Declaration but do not specify if ethical approval was obtained for the study. Please clarify whether ethical approval was sought and obtained, and from which institution.

Discussion, Paragraph 4: The discussion suggests developing cost-effective VR systems but does not address the potential technical challenges or barriers to implementation. Including a brief discussion on these aspects would provide a more comprehensive view.

Introduction, Paragraph 2: The prevalence statistics for ASD (e.g., 1 in 160 children globally) are somewhat outdated. Please provide more recent prevalence data to ensure the information is current.

Methods and Materials, Data Collection: The process of data extraction is mentioned, but it would be helpful to specify if a standardized form or software was used to ensure consistency and reduce bias.

Author revised the manuscript and uploaded the updated document.

2. Revised

Editor's decision after revisions: Accepted.

Editor in Chief's decision: Accepted.

2.1