INPLASY PROTOCOL

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None declared.

A meta-analysis of virtual reality therapy for patients with autism spectrum disorder

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Review question / Objective: **P: autistic; I: Virtual reality therapy; C: conventional rehabilitation techniques or blank control; O: General improvement, daily living skills, emotion recognition and regulation, social and communication skills, language function; S: Randomized controlled trial.**
Information sources: **Computer retrieval of China Biomedical Literature Database (CBM), VIP, WanFang Data, CNKI, PubMed, The Cochrane Library, Web of Science, Embase, Clinical randomized controlled trial studies on the use of virtual reality technology in children with ASD were collected, and the retrieval time limit was established until April 2, 2022.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 April 2022 and was last updated on 28 April 2022 (registration number INPLASY202240162).

INTRODUCTION

Review question / Objective: **P: autistic; I: Virtual reality therapy; C: conventional rehabilitation techniques or blank control; O: General improvement, daily living skills, emotion recognition and regulation, social and communication skills, language function; S: Randomized controlled trial.**

Condition being studied: **Autism spectrum disorder. Two researchers searched online Chinese and English databases for relevant literature. The title and abstract of the obtained literature were read, and the literature meeting the inclusion criteria was initially screened and the full text was downloaded. Then, the literatures meeting**

the inclusion criteria were read in full, and the results of inclusion and exclusion were cross-checked at last. Disputes, if any, shall be resolved through discussion or consultation with a third party. The input literature was extracted by the original researcher, including: ① title, author, publication date and source, etc.; ② Baseline characteristics and intervention measures of subjects; ③ Implementation of randomization scheme, blind method; ④ Related outcome measures.

METHODS

Participant or population: Patients with autism spectrum disorder.

Intervention: Virtual reality therapy.

Comparator: Routine rehabilitation technique or blank control.

Study designs to be included: RCT.

Eligibility criteria: Patients who meet the diagnostic criteria for ASD in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and have been clinically diagnosed with ASD are regardless of race or gender.

Information sources: Computer retrieval of China Biomedical Literature Database (CBM), VIP, WanFang Data, CNKI, PubMed, The Cochrane Library, Web of Science, Embase, Clinical randomized controlled trial studies on the use of virtual reality technology in children with ASD were collected, and the retrieval time limit was established until April 2, 2022.

Main outcome(s): The analysis results of the overall improvement effect, daily living skills, emotional recognition and regulation function, social and communication skills, and language function showed that the curative effect of VR technology intervention or VR technology combined with conventional rehabilitation therapy was superior to conventional rehabilitation therapy.

Quality assessment / Risk of bias analysis: Two researchers used the QUALITY evaluation criteria of RCT in the Cochrane Review Manual to evaluate the quality of the included literatures. ② Allocate hidden scheme; ③whether to implement blind method; ④ Integrity of result data; ⑤ Selective reporting of research results; ⑥ Other sources of bias. Low bias risk is represented by "yes", high bias risk is represented by "no", and "unclear" means that the literature does not provide enough information to complete the bias analysis. The quality evaluation of literature grade was divided into GRADE A (minimum possible bias), grade B (moderate bias), and grade C (high bias).

Strategy of data synthesis: RevMan 5.3 software was used for statistical analysis. Heterogeneity among the included results was analyzed by χ2 test (α=0.1), and the heterogeneity was quantitatively determined by I^2. If $P > 0.1$ and $I^2 < 50\%$, the included studies were considered to be homogenous, and the fixed-effect model was used for meta-analysis. If $P < 0.1$ and $I^2 \geq 50\%$, heterogeneity was considered among the included studies and random effect model was adopted. When the source of heterogeneity could not be determined, descriptive analysis was used instead of meta-analysis. The weighted mean difference was used for analysis when the effects of the same intervention were measured with the same tools; the standardized mean difference was used for analysis when the effects of the same intervention were measured with different tools, or the mean was significantly different between studies. 95% confidence intervals were calculated for all analyses.

Subgroup analysis: No subgroups.

Sensitivity analysis: For each outcome index, no substantial change was found after removing individual studies one by one, indicating that the results of meta-analysis were relatively stable. Due to the small number of literatures included in this paper, it is of little significance to conduct meta-regression analysis and subgroup

analysis, and the analysis will be carried out when the number of relevant studies is large enough.

Country(ies) involved: China.

Keywords: ASD; VR; Curatuve effect.

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