| **Section and Topic** | **Item #** | **Checklist item** | **Location where item is reported** |
| --- | --- | --- | --- |
| **TITLE** | | |  |
| Title | 1 | Identify the report as a systematic review. | The title of the article has been clearly defined as “meta analysis”, and the title meets the requirements. |
| **ABSTRACT** | | |  |
| Abstract | 2 | See the PRISMA 2020 for Abstracts checklist. | The summary includes background, methods, results and conclusions |
| **INTRODUCTION** | | |  |
| Rationale | 3 | Describe the rationale for the review in the context of existing knowledge. | The introduction describes the potential of VR technology in stroke rehabilitation and the limitations of existing research (such as literature 1–8). |
| Objectives | 4 | Provide an explicit statement of the objective(s) or question(s) the review addresses. | At the end of the introduction, the goal was put forward: “systematically summarize the relevant research in recent 3 years, and provide evidence support for clinical practice”. |
| **METHODS** | | |  |
| Eligibility criteria | 5 | Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses. | “2.3 Inclusion and Exclusion Criteria” |
| Information sources | 6 | Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted. | “2.2 literature search strategy” lists the databases (PubMed, Elsevier, web of Science) and the retrieval time (01 January 2022–20 January 2025). |
| Search strategy | 7 | Present the full search strategies for all databases, registers and websites, including any filters and limits used. | Only examples of retrieval keywords (such as “virtual reality and stroke”) are provided, and the retrieval formulas of all databases are not completely listed. |
| Selection process | 8 | Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process. | “2.4 literature screening and data extraction” describes the two person independent screening and dispute resolution mechanism. |
| Data collection process | 9 | Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process. | The same as “2.4”, indicating that the data were extracted independently by two researchers. |
| Data items | 10a | List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (*e.g.*, for all measures, time points, analyses), and if not, the methods used to decide which results to collect. | FMA, BBT, BBS, ARAT, BI and other outcome indicators and their definitions are clearly listed in “2.4”. |
| 10b | List and define all other variables for which data were sought (*e.g.*, participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information. | Table 1 lists the basic characteristics of the included studies (country, sample size, intervention time, *etc*.). |
| Study risk of bias assessment | 11 | Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process. | “2.5” indicates that the Cochrane risk bias tool is used and independently assessed by two persons. |
| Effect measures | 12 | Specify for each outcome the effect measure(s) (*e.g.*, risk ratio, mean difference) used in the synthesis or presentation of results. | “2.6” indicates the use of SMD (standardized mean difference) and 95% confidence interval. |
| Synthesis methods | 13a | Describe the processes used to decide which studies were eligible for each synthesis (*e.g.*, tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)). | 2.6 Statistical Analysis |
| 13b | Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions. | 2.6 Statistical Analysis |
| 13c | Describe any methods used to tabulate or visually display results of individual studies and syntheses. | 2.6 Statistical Analysis |
| 13d | Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used. | 2.6 Statistical Analysis |
| 13e | Describe any methods used to explore possible causes of heterogeneity among study results (*e.g.*, subgroup analysis, meta-regression). | 2.6 Statistical Analysis |
| 13f | Describe any sensitivity analyses conducted to assess robustness of the synthesized results. | 2.6 Statistical Analysis |
| Reporting bias assessment | 14 | Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases). | Funnel plots |
| Certainty assessment | 15 | Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome. | 2.5 Quality Assessment of Literature |
| **RESULTS** | | |  |
| Study selection | 16a | Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram. | Fig. 1 |
| 16b | Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded. | Fig. 1 |
| Study characteristics | 17 | Cite each included study and present its characteristics. | Table 1 |
| Risk of bias in studies | 18 | Present assessments of risk of bias for each included study. | Fig. 2 |
| Results of individual studies | 19 | For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (*e.g.*, confidence/credible interval), ideally using structured tables or plots. | Figs. 3,4,5,6,7 |
| Results of syntheses | 20a | For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies. | Figs. 3,4,5,6,7 |
| 20b | Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (*e.g.*, confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect. | Figs. 3,4,5,6,7 |
| 20c | Present results of all investigations of possible causes of heterogeneity among study results. | Figs. 3,4,5,6,7 |
| 20d | Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results. | Figs. 3,4,5,6,7 |
| Reporting biases | 21 | Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed. | No specific results were reported. |
| Certainty of evidence | 22 | Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed. | Fig. 2 |
| **DISCUSSION** | | |  |
| Discussion | 23a | Provide a general interpretation of the results in the context of other evidence. | The discussion part compares previous studies (such as literature 29–48) to support the effectiveness of VR technology. |
| 23b | Discuss any limitations of the evidence included in the review. | The conclusion part points out that “the sample size is small, the heterogeneity is high, and there is a lack of long-term effect data”. |
| 23c | Discuss any limitations of the review processes used. | English database only |
| 23d | Discuss implications of the results for practice, policy and future research. | At the end of the discussion, it was proposed that the VR training scheme should be optimized and the long-term effect should be explored. |
| **OTHER INFORMATION** | | |  |
| Registration and protocol | 24a | Provide registration information for the review, including register name and registration number, or state that the review was not registered. | “2.1” refers to the registration in splasy (No.: INPLASY202520082） |
| 24b | Indicate where the review protocol can be accessed, or state that a protocol was not prepared. | <https://inplasy.com/inplasy-2025-2-0082/> |
| 24c | Describe and explain any amendments to information provided at registration or in the protocol. | No |
| Support | 25 | Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review. | “Funding” declares that there is no financial support. |
| Competing interests | 26 | Declare any competing interests of review authors. | “Competing interests” declares that there is no conflict of interest. |
| Availability of data, code and other materials | 27 | Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review. | “Data availability” states that data can be obtained from the corresponding author. |

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