



Virtual reality in post-stroke neurorehabilitation – a systematic review and meta-analysis

Perhaps the most important aspect of a paper is its take-home message. Unfortunately, the take-home message in the recent paper by Khan, Podlasek, and Somaa (“Virtual reality in post-stroke neurorehabilitation – a systematic review and meta-analysis,” *Topics in Stroke Rehabilitation*, 30, 53-72, 2023) conflicts completely with their otherwise sound review and meta-analysis.

The authors undertook a systematic review and meta-analysis of recent experimental studies which “have reported the beneficial influence of virtual reality training strategies on improving overall functional abilities for stroke survivors.” They found and reviewed 150 studies and included 46 for qualitative and 27 for quantitative analysis. They found no statistically significant difference between groups in MMSE score ($p = .47$), Fugl-Meyer score ($p = .95$), and any other outcome. Yet they concluded (take-home message in Abstract) “This review supports that stroke rehabilitation programs incorporating virtual reality are associated with improved functional outcomes,”

despite correctly reiterating “but there is no statistically significant difference compared to standard therapy.”

Thus, this review and meta-analysis has provided no evidence for any efficacy of virtual reality in post-stroke neurorehabilitation. Conversely, this does not prove that there is no benefit (i.e. the null hypothesis) but it does indicate that if there is any benefit, it is, at most, small and likely to be clinically insignificant.

Thus, the conclusion is this paper is incorrect and misleading, especially for readers who might not critically go beyond the “take-home message.”

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