

# INPLASY

## Stroke survivors have almost three times higher risk of depression; a systematic review and meta-analysis

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### ADMINISTRATIVE INFORMATION

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**Review Stage at time of this submission** - Preliminary searches.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202440106

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 April 2024 and was last updated on 19 December 2024.

### INTRODUCTION

**Review question / Objective** What is the prevalence of post-stroke depression, and what is the odds ratio of developing depression in stroke survivors compared to the general population?

**Condition being studied** Post-stroke depression

### METHODS

**Search strategy** Both PubMed and Web of Science databases were searched based on the following PICO:

P: adult patients with brain stroke;

I: N/A;

C: prevalence of depression in stroke survivors versus control groups;

O: prevalence

The following search concepts were designed based on the abovementioned PICO for PubMed database:

Concept 1:

-stroke [tw]

-stroke [MeSH]

-post-stroke [tw]

concept 2:

-depression [tw]

-depression [MeSH]

concept 3:

-prevalence [tw]

-prevalence [MeSH]

-incidence [tw]

-incidence [MeSH]

The elements of each concept were added to PubMed search query using OR and then three concepts were added with AND, building the following PubMed search query:

((((stroke[Text Word]) OR (post-stroke[Text Word])) OR (stroke[MeSH Terms])) AND ((depression[Text Word]) OR (depression[MeSH Terms]))) AND (((prevalence[Text Word]) OR (prevalence[MeSH Terms])) OR (incidence[Text Word])) OR (incidence[MeSH Terms]))

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Finally the same exact search strategy was adapted based on Web of Science database requirements.

**Participant or population** Cases were considered as adult stroke survivors which were compared with control group.

**Intervention** N/A.

**Comparator** Prevalence of depression compared between stroke survivors and control group.

**Study designs to be included** Observational study designs were included, including: retrospective and prospective cohort studies, case-control studies and cross sectional studies.

**Eligibility criteria** All studies reporting the odds ratio for post-stroke depression, or providing sufficient data to calculate it, were eligible for inclusion to address the primary objective. Additionally, studies that reported only the proportional prevalence of post-stroke depression were included to fulfill the secondary objective.

**Information sources** The information were gathered from both PubMed and Web of Science databases and also the bibliography list of similar review articles and included papers.

**Main outcome(s)** The main outcome was the odds ratio (95% CI) for post-stroke depression, while the effect size was measured using the log rate ratio and standard error.

**Additional outcome(s)** Additional outcome was the proportional prevalence of post-stroke depression, reported as a percentage in all studies, regardless of whether they included an odds ratio.

**Quality assessment / Risk of bias analysis** For the quality and risk of bias assessment of cohort and case-control studies, the Newcastle-Ottawa Scale (NOS) was applied. An adapted version of the NOS was used to evaluate cross-sectional studies.

A color-coding system was implemented for better visualization of the risk of bias: red for scores of 0 to 3 (high risk), yellow for scores of 4 to 6 (moderate risk), and green for scores of 7 to 9 (low risk)."

**Strategy of data synthesis** All studies reporting odds ratios were selected for quantitative data synthesis using random effects model in Comprehensive Meta-Analysis version 4

(Borenstein, M., Hedges, L., Rothstein, H. Biostat, Englewood, NJ, 2022).

Heterogeneity was assessed using  $I^2$  and  $Q$  statistics (P-value), while publication bias was qualitatively evaluated through visual inspection of Begg's funnel plot and quantitatively assessed using Begg and Mazumdar's rank correlation and Egger's regression tests.

IBM SPSS Statistics (version 27) was employed to calculate the proportional prevalence of post-stroke depression.

**Subgroup analysis** A subgroup analysis was conducted based on follow-up periods of greater than 1 year and 1 year or less.

**Sensitivity analysis** The 'one study removed' method was employed to conduct the sensitivity analysis.

**Language restriction** None.

**Country(ies) involved** Spain (Balearic Islands University).

**Keywords** depression; stroke; prevalence; meta-analysis; odds ratio.

#### **Contributions of each author**

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