

Frailty evaluation for predicting the survival in patients with glioma: a meta-analysis

Qiuyan Xiang¹, Sha Luo¹, Guangyao Chen², Yiwen Liu^{3 4}

Affiliations

PMID: 40637871 DOI: [10.1007/s10143-025-03693-w](https://doi.org/10.1007/s10143-025-03693-w)

Abstract

Background: Frailty, a multidimensional syndrome associated with decreased physiological reserve, may influence survival outcomes in patients with glioma. This meta-analysis aimed to evaluate the association between frailty and survival outcomes in glioma patients, with implications for nursing and clinical practice.

Methods: This meta-analysis included cohort studies investigating frailty and survival in glioma patients. Comprehensive searches were conducted in PubMed, Embase, and Web of Science up to October 2024. Hazard ratios (HRs) with 95% confidence intervals (CIs) were pooled using a random-effects model. Sensitivity analyses using a leave-one-out approach were performed to evaluate the robustness of the finding. Subgroup and meta-regression analyses were performed to evaluate the influence of study characteristics on the outcome.

Results: Eleven cohort studies involving 2,519 patients were included. Frailty was significantly associated with poorer overall survival (OS) in glioma patients (HR: 1.47, 95% CI: 1.25-1.74, $p < 0.001$) with moderate heterogeneity (p for Cochrane Q test = 0.12, $I^2 = 35\%$). Subgroup analyses revealed consistent results across tumor grades ($p = 0.92$), primary treatments ($p = 0.82$), age groups ($p = 0.14$), proportion of men ($p = 0.23$), frailty assessment methods ($p = 0.43$), follow-up durations ($p = 0.25$), analytic models ($p = 0.30$), and study quality scores ($p = 0.21$). Meta-regression did not show a significant influence of sample size, mean age, sex, follow-up duration, or study quality score on the association (p all > 0.05). Frailty was also associated with shorter progression-free survival (HR: 1.20, 95% CI: 1.06-1.36, $p = 0.004$) with mild heterogeneity (p for Cochrane Q test = 0.41, $I^2 = 0\%$).

Conclusion: Frailty appears to be a significant predictor of poorer survival in glioma patients, underscoring its importance in clinical decision-making and patient care. Integrating frailty assessments into nursing and treatment protocols could improve outcome predictions and tailored interventions.

Keywords: Frailty; Glioma; Meta-analysis; Progression; Survival.

© 2025. The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

[PubMed Disclaimer](#)