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Risk prediction models for sarcopenia in patients with gastrointestinal malignancies: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 March 2026 and was last updated on 14 March 2026.

INTRODUCTION

Review question / Objective The aim of this systematic review is to systematically identify, summarize, and critically appraise studies that developed and/or validated risk prediction models for sarcopenia in adult patients with gastrointestinal malignancies. The review will summarize model characteristics, predictors, performance, and validation methods, and, where feasible, conduct meta-analyses of sarcopenia prevalence and common risk factors.

Rationale Gastrointestinal malignancies, especially gastric cancer and colorectal cancer, are among the most common and deadly cancers worldwide. Sarcopenia is common in patients with gastrointestinal malignancies and is associated with poor nutritional status, longer hospital stay, postoperative complications, reduced survival, and poor prognosis. Although several risk prediction models for sarcopenia in gastrointestinal malignancy patients have been developed and validated, their methodological quality, predictive performance, and clinical applicability vary. At present, there is still a lack of a dedicated systematic review focusing on these prediction models. Therefore, this review is needed to provide evidence for model development, validation, clinical application, optimization, and individualized prevention and management.

Condition being studied Sarcopenia is a syndrome characterized by progressive and generalized loss of skeletal muscle mass, strength, and function. It is common in patients with gastrointestinal malignancies, particularly gastric cancer and colorectal cancer, and is associated with adverse clinical outcomes and poor prognosis. This review focuses on sarcopenia in adult patients with gastrointestinal malignancies and the risk prediction models used to identify patients at high risk of developing sarcopenia.

METHODS

Participant or population Adult patients (aged 18 years or older) with pathologically confirmed gastrointestinal malignancies will be eligible.

Intervention Sarcopenia risk prediction model for patients with gastrointestinal malignancies.

Comparator Does not apply.

Study designs to be included Cross-sectional studies and cohort studies.

Eligibility criteria Inclusion criteria: (1) studies involving adults aged 18 years or older with pathologically confirmed gastrointestinal malignancies; (2) cross-sectional or cohort studies; and (3) studies reporting the development and/or validation of a risk prediction model for sarcopenia. Exclusion criteria: (1) studies published in languages other than Chinese or English; (2) duplicate publications or studies with unavailable full text; (3) studies reporting only risk factors without constructing a complete prediction model; and (4) studies including fewer than two predictors in the final model.

Information sources PubMed, Embase, Web of Science, Cochrane Library, CINAHL, CNKI, Wanfang Data, and VIPDatabase.

Main outcome(s) Sarcopenia.

Quality assessment / Risk of bias analysis Two reviewers will independently assess risk of bias and applicability using the Prediction model Risk Of Bias ASsessment Tool (PROBAST). Any disagreement will be resolved by discussion with a third reviewer.

Strategy of data synthesis RevMan 5.4.1 will be used to perform meta-analysis of the predictors. For dichotomous variables, odds ratios (ORs) with 95% confidence intervals (CIs) will be used as the effect measures. Heterogeneity among studies will be assessed using the chi-square test ($\alpha = 0.1$) and the I^2 statistic. If there is no significant heterogeneity ($P > 0.1$ and $I^2 < 50\%$), a fixed-effect model will be used. If significant heterogeneity is present ($P < 0.1$ and $I^2 \geq 50\%$), the sources of heterogeneity will be further explored, and a random-effects model will be used after excluding obvious clinical heterogeneity. The significance level for meta-analysis will be set at $\alpha = 0.05$.

Subgroup analysis None.

Sensitivity analysis None.

Country(ies) involved China.

Keywords gastrointestinal malignancy; sarcopenia; risk prediction model; prognostic model; nomogram; systematic review; meta-analysis.

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