Section and Topic	Item	Checklist item	Section of manuscript	Location where item is reported
Title	1	Identify the report as a systematic review.	Title	Page1, Correlation between sarcopenia and esophageal cancer: a narrative review
Abstract	2			
Background				
Objectives		Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Abstract	Page1, " This review examines the prevalence of sarcopenia in patients with esophageal cancer, as well as the relationship between sarcopenia (before and after surgery or chemotherapy) and prognosis in patients with esophageal cancer. Moreover, we summarized the potential pathogenesis of sarcopenia and pharmacologic and non-pharmacologic therapies. "
Methods				
Eligibility criteria		Specify the inclusion and exclusion criteria for the review.	Abstract	Page1, " Methods: A narrative review was performed in PubMed and Web of Science using the keywords (“esophageal cancer” or “esophageal neoplasm” or “neoplasm, esophageal” or “esophagus neoplasm” or “esophagus neoplasms” or “neoplasm, esophagus” or “neoplasms, esophagus” or “neoplasms, esophageal” or “cancer of esophagus” or “cancer of the esophagus” or “esophagus cancer” or “cancer, esophagus” or “cancers, esophagus” or

				“esophagus cancers” or “esophageal cancer” or “cancer, esophageal” or “cancers, esophageal” or “esophageal cancers”) and (“sarcopenia” or “muscular atrophy” or “aging” or “senescence” or “biological aging” or “aging, biological” or “atrophies, muscular” or “atrophy, muscular” or “muscular atrophies” or “atrophy, muscle” or “atrophies, muscle” or “muscle atrophies”). Studies reporting relationship between sarcopenia and esophageal cancer were analyzed. "
Information sources		Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Abstract	Page1, " Methods: A narrative review was performed in PubMed and Web of Science using the keywords (“esophageal cancer” or “esophageal neoplasm” or “neoplasm, esophageal” or “esophagus neoplasm” or “esophagus neoplasms” or “neoplasm, esophagus” or “neoplasms, esophagus” or “neoplasms, esophageal” or “cancer of esophagus” or “cancer of the esophagus” or “esophagus cancer” or “cancer, esophagus” or “cancers, esophagus” or “esophagus cancers” or “esophageal cancer” or “cancer, esophageal” or “cancers, esophageal” or “esophageal

				cancers") and ("sarcopenia" or "muscular atrophy" or "aging" or "senescence" or "biological aging" or "aging, biological" or "atrophies, muscular" or "atrophy, muscular" or "muscular atrophies" or "atrophy, muscle" or "atrophies, muscle" or "muscle atrophies"). Studies reporting relationship between sarcopenia and esophageal cancer were analyzed. "
Risk of bias		Specify the methods used to assess risk of bias in the included studies.		not applicable
Synthesis of results		Specify the methods used to present and synthesise results.		not applicable
Results				
Included studies		Give the total number of included studies and participants and summarise relevant characteristics of studies		not applicable
Synthesis of results		Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done,	Abstract	Page2, "Results: The results of the review suggest that the average prevalence of sarcopenia in esophageal cancer was 46.3 % ± 19.6% ranging from 14.4% to 81% and sarcopenia can be an important predictor of poor prognosis in patients with esophageal cancer.

		report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).		Patients with esophageal cancer can suffer from sarcopenia due to their nutritional deficiencies, reduced physical activity, chemotherapy and the effects of certain inflammatory factors and pathways. When classic diagnostic values for sarcopenia such as skeletal muscle index (SMI) are not available clinically, it is also feasible to predict esophageal cancer prognosis using simpler metrics, such as calf circumference (CC), five-count sit-up test (5-CST), six-minute walk distance (6MWD), etc. "
Discussion				
Limitations of evidence		Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).		not applicable
Interpretation		Provide a general interpretation of the results and important implications.	Abstract	Page2, " Conclusions: Identifying the potential mechanism of sarcopenia in patients with esophageal cancer and implementing appropriate interventions, may hold the key to improving the prognosis of these patients. "
Introduction				
Rationale	3	Describe the	Introduction	Page2, the introduction section

		rationale for the review in the context of existing knowledge.		introduces the relevant background about esophageal cancer and sarcopenia and the purpose of this review
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Introduction	Page4, "In this comprehensive review, we delve into various aspects related to sarcopenia in patients with esophageal cancer, including its incidence, prognostic value, the interplay between chemotherapy and sarcopenia, the underlying mechanisms of sarcopenia, therapeutic approaches, and alternative methods for predicting sarcopenia. Our aim is to critically evaluate the combined prognostic impact of factors associated with esophageal cancer and sarcopenia, drawing practical conclusions to support the multidisciplinary management of patients with esophageal cancer and offering fresh insights for the development of therapeutic regimens targeting this disease. "
Methods				
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Abstract	Page1, "Methods: A narrative review was performed in PubMed and Web of Science using the keywords (“esophageal cancer” or “esophageal neoplasm” or “neoplasm, esophageal” or “esophagus neoplasm” or “esophagus neoplasms” or “neoplasm, esophagus” or

				“neoplasms, esophagus” or “neoplasms, esophageal” or “cancer of esophagus” or “cancer of the esophagus” or “esophagus cancer” or “cancer, esophagus” or “cancers, esophagus” or “esophagus cancers” or “esophageal cancer” or “cancer, esophageal” or “cancers, esophageal” or “esophageal cancers”) and (“sarcopenia” or “muscular atrophy” or “aging” or “senescence” or “biological aging” or “aging, biological” or “atrophies, muscular” or “atrophy, muscular” or “muscular atrophies” or “atrophy, muscle” or “atrophies, muscle” or “muscle atrophies”). Studies reporting relationship between sarcopenia and esophageal cancer were analyzed. "
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.	Abstract	Page1, "Methods: A narrative review was performed in PubMed and Web of Science using the keywords (“esophageal cancer” or “esophageal neoplasm” or “neoplasm, esophageal” or “esophagus neoplasm” or “esophagus neoplasms” or “neoplasm, esophagus” or “neoplasms, esophagus” or “neoplasms, esophageal” or “cancer of esophagus” or “cancer of the esophagus” or “esophagus

				cancer" or "cancer, esophagus" or "cancers, esophagus" or "esophagus cancers" or "esophageal cancer" or "cancer, esophageal" or "cancers, esophageal" or "esophageal cancers") and ("sarcopenia" or "muscular atrophy" or "aging" or "senescence" or "biological aging" or "aging, biological" or "atrophies, muscular" or "atrophy, muscular" or "muscular atrophies" or "atrophy, muscle" or "atrophies, muscle" or "muscle atrophies"). Studies reporting relationship between sarcopenia and esophageal cancer were analyzed. "
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used	Abstract	Page1, "Methods: A narrative review was performed in PubMed and Web of Science using the keywords ("esophageal cancer" or "esophageal neoplasm" or "neoplasm, esophageal" or "esophagus neoplasm" or "esophagus neoplasms" or "neoplasm, esophagus" or "neoplasms, esophagus" or "neoplasms, esophageal" or "cancer of esophagus" or "cancer of the esophagus" or "esophagus cancer" or "cancer, esophagus" or "cancers, esophagus" or "esophagus cancers" or "esophageal cancer" or "cancer,

				esophageal" or "cancers, esophageal" or "esophageal cancers") and ("sarcopenia" or "muscular atrophy" or "aging" or "senescence" or "biological aging" or "aging, biological" or "atrophies, muscular" or "atrophy, muscular" or "muscular atrophies" or "atrophy, muscle" or "atrophies, muscle" or "muscle atrophies"). Studies reporting relationship between sarcopenia and esophageal cancer were analyzed. "
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.		not applicable
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected		not applicable

		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.		
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.		not applicable
	10b	List and define all other variables for which data were sought (e.g. participant and intervention		not applicable

		characteristics, funding sources). Describe any assumptions made about any missing or unclear information.		
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.		not applicable
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.		not applicable
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention		not applicable

		characteristics and comparing against the planned groups for each synthesis (item #5)).		
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.		not applicable
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.		not applicable
	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		not applicable

		heterogeneity, and software package(s) used.		
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).		not applicable
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.		not applicable
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).		not applicable
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.		not applicable
Results				
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in		not applicable

		the search to the number of studies included in the review, ideally using a flow diagram.		
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.		not applicable
Study characteristics	17	Cite each included study and present its characteristics.		Page28, Table1,2,3
Risk of bias in studies	18	Present assessments of risk of bias for each included study.		not applicable
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.	2. Prevalence of sarcopenia in esophageal cancer	Page5, " Among the included studies (Table 1), the average prevalence of sarcopenia in esophageal cancer was found to be 46.3% ± 19.6%. "
			3. The role of sarcopenia in the prognosis of surgical treatment of esophageal cancer	Page 5, "Numerous studies have demonstrated that preoperative sarcopenia not only increases the risk of complications such as pulmonary issues and mortality in older adults, but also leads to extended hospital stays and reduced survival rates. Numerous studies have demonstrated that preoperative sarcopenia not only increases the risk of complications

				such as pulmonary issues and mortality in older adults, but also leads to extended hospital stays and reduced survival rates." Page 6, "Apart from its impact on surgical complications, preoperative sarcopenia has also been linked to long-term prognosis." is a presentation of the results;
			4. Chemotherapy and sarcopenia	Page 7," 4.1 Chemotherapy-induced sarcopenia" Page 9," Table 2 lists the studies related to the effect of sarcopenia on chemotherapy in esophageal cancer. Based on the a forementioned studies, it is evident that sarcopenia independently indicates reduced overall survival, disease-free survival, and recurrence-free survival in patients with esophageal cancer who undergo chemotherapy. Furthermore, sarcopenia increases the incidence of toxic reactions, mucositis, fever, and lymphopenia, consequently leading to perioperative complications, an elevated risk of postoperative recurrence rates, and postoperative mortality. "
			5. Potential mechanisms of esophageal	Page9, each subheading is a result section Page9, 5.1 Malnutrition

			cancer-associated sarcopenia	Page10, 5.2 Lack of exercise lifestyle Page10, 5.3 Inflammation Page10, 5.4 Chemotherapy causes sarcopenia Page11, 5.5 Other signaling pathways
			6. Predicting esophageal cancer prognosis with a simple indicator in the diagnosis of sarcopenia	Page 12," Besides assessing the presence of sarcopenia according to diagnostic criteria and gauging its prognostic significance, researchers have been particularly intrigued by the extent of skeletal muscle mass reduction during treatment or post-surgery. In instances where standardized tests fail to meet the criteria for diagnosing sarcopenia, employing alternative, efficient methods like HGS, 5-SCT, GS, 6MWD, and CC to predict prognosis is highly desirable. "
			7. Treatment of sarcopenia	7.1 non-pharmacological treatment 7.2 Pharmacologic Treatment
			8. Conclusions and future perspectives	the section "8. Conclusions and future perspectives" presents the conclusions and discussion of the entire review.
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.		not applicable
	20b	Present results of all		not applicable

		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.		
	20c	Present results of all investigations of possible causes of heterogeneity among study results.		not applicable
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.		not applicable
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.		not applicable
Certainty of evidence	22	Present assessments of certainty (or		not applicable

		confidence) in the body of evidence for each outcome assessed.		
Discussion				
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	2. Prevalence of sarcopenia in esophageal cancer	Page5, " However, the prevalence of sarcopenia in patients with esophageal cancer varies considerably due to differences in study populations, age, diagnostic methods, and criteria, and the criteria used to determine the prevalence of sarcopenia varied among the studies in this review, as shown in Table 1, with prevalence rates ranging from 14.4% to 81%. " Page5, " Despite discrepancies in diagnostic criteria and methods, sarcopenia was frequently diagnosed during preoperative examinations in patients with esophageal cancer. Given that esophageal cancer exhibits the highest prevalence of sarcopenia among gastrointestinal tumors, it is imperative to allocate greater attention to this condition in esophageal cancer patients. "
			5. Potential mechanisms of esophageal cancer-associated sarcopenia	Page9, this section is discussing the possible causes of sarcopenia.

			6. Predicting esophageal cancer prognosis with a simple indicator in the diagnosis of sarcopenia	Page12, "Besides assessing the presence of sarcopenia according to diagnostic criteria and gauging its prognostic significance, researchers have been particularly intrigued by the extent of skeletal muscle mass reduction during treatment or post-surgery. In instances where standardized tests fail to meet the criteria for diagnosing sarcopenia, employing alternative, efficient methods like HGS, 5-SCT, GS, 6MWD, and CC to predict prognosis is highly desirable. "
	23b	Discuss any limitations of the evidence included in the review.	2. Prevalence of sarcopenia in esophageal cancer	Page5, " However, the prevalence of sarcopenia in patients with esophageal cancer varies considerably due to differences in study populations, age, diagnostic methods, and criteria, and the criteria used to determine the prevalence of sarcopenia varied among the studies in this review, as shown in Table 1, with prevalence rates ranging from 14.4% to 81%. " Page5, " Despite discrepancies in diagnostic criteria and methods, sarcopenia was frequently diagnosed during preoperative examinations in patients with esophageal cancer. Given that esophageal cancer exhibits the highest prevalence of sarcopenia

				among gastrointestinal tumors, it is imperative to allocate greater attention to this condition in esophageal cancer patients. "
			7. Treatment of sarcopenia	Page15, "Despite the existence of studies showcasing the positive effects of the aforementioned drugs in sarcopenia patients, their efficacy remains a subject of controversy. Furthermore, the optimal dosage and potential side effects of these drugs require further investigation through additional studies. The pharmacological treatment of sarcopenia necessitates more extensive exploration and clinical trials to scientifically evaluate the efficacy of these drugs. "
			8. Conclusions and future perspectives	Page15, "To date, the majority of studies investigating sarcopenia in esophageal cancer patients have primarily relied on retrospective approaches, severely constraining their ability to comprehensively depict patient populations. Consequently, our understanding of the underlying mechanisms linked to heightened adverse outcomes remains limited"
	23c	Discuss any limitations of the review processes used.		not applicable
	23d	Discuss implications	2. Prevalence	Page5, " Despite discrepancies in

		of the results for practice, policy, and future research.	of sarcopenia in esophageal cancer	diagnostic criteria and methods, sarcopenia was frequently diagnosed during preoperative examinations in patients with esophageal cancer. Given that esophageal cancer exhibits the highest prevalence of sarcopenia among gastrointestinal tumors, it is imperative to allocate greater attention to this condition in esophageal cancer patients. "
			3. The role of sarcopenia in the prognosis of surgical treatment of esophageal cancer	Page 6, "Consequently, the routine evaluation and accurate diagnosis of sarcopenia in older adults has been linked to long-term prognosis. diagnosis of sarcopenia in esophageal cancer patients can assist clinicians in tailoring treatment plans, providing timely nutritional support, and ultimately improving short-term and long-term patient outcomes, as well as the overall prognosis of esophageal cancer." Page 7," The prognosis of postoperative muscle loss in esophageal cancer has received limited attention and the timing of postoperative detection of sarcopenia varies considerably across studies, but each of these studies consistently demonstrates a substantial association between postoperative muscle loss or reduced skeletal muscle mass and

				poor prognosis, and more prospective cohort studies are needed to demonstrate this association."
			4. Chemotherapy and sarcopenia	Page 9," Early implementation of appropriate nutritional intervention prior to treatment may improve prognosis"
			6. Predicting esophageal cancer prognosis with a simple indicator in the diagnosis of sarcopenia	Page12, "Besides assessing the presence of sarcopenia according to diagnostic criteria and gauging its prognostic significance, researchers have been particularly intrigued by the extent of skeletal muscle mass reduction during treatment or post-surgery. In instances where standardized tests fail to meet the criteria for diagnosing sarcopenia, employing alternative, efficient methods like HGS, 5-SCT, GS, 6MWD, and CC to predict prognosis is highly desirable. "
			7. Treatment of sarcopenia	Page15, "Despite the existence of studies showcasing the positive effects of the aforementioned drugs in sarcopenia patients, their efficacy remains a subject of controversy. Furthermore, the optimal dosage and potential side effects of these drugs require further investigation through additional studies. The pharmacological treatment of sarcopenia necessitates more

				extensive exploration and clinical trials to scientifically evaluate the efficacy of these drugs. "
			8. Conclusions and future perspectives	Page15, "Hence, it is imperative to conduct more prospective evaluations on sarcopenia in individuals afflicted with esophageal cancer. These evaluations will enable us to establish a more profound comprehension of the correlation between sarcopenia, characterized by the depletion of skeletal muscle mass or strength, and adverse outcomes or post-treatment complications. Furthermore, they will facilitate the development of precise and personalized interventions based on the findings, thereby enhancing outcomes in high-risk populations[114]. By performing requisite assessments of sarcopenia in esophageal cancer patients, we can devise optimal treatment strategies that rectify the sarcopenic condition prior to surgery or chemotherapy through nutritional support and exercise, adjuvant therapy, and meticulous postoperative monitoring[115]. This comprehensive approach aims to augment the quality of life for patients with esophageal cancer while simultaneously alleviating

				the healthcare burden on society."
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.		not applicable
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.		not applicable
	24c	Describe and explain any amendments to information provided at registration or in the protocol.		not applicable
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	Page17, "This work was supported by Natural Science Foundation General Program of Hunan Province (2022JJ40830), Natural Science Foundation General Program of Changsha City (kq2014290) and National Multidisciplinary Cooperative Diagnosis and Treatment Capacity Building Project for Major Diseases (Lung Cancer, grant number: z027002). "
Competing interests	26	Declare any competing interests	Competing interests	Page17,"The authors declare that they have no competing interests."

		of review authors.		
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.		not applicable