

Online Resource 1.



PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Line 1-2
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Line 3-28
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Line 61-82
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Line 83-88
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Line 98-105
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.	Line 107-110
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Line 110
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.	Line 111-123
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected 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.	Line 143-151
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.	Line 130-134
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Line 143-149
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.	Line 152-158
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.	Line 130-134
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Line 185-186
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Line 163-176
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Line 177-180
	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 heterogeneity, and software package(s) used.	Line 177
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Line 172-176
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Line 175
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.	Line 155-158



PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Line 175-179
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Line 177-179
Study characteristics	17	Cite each included study and present its characteristics.	Line 180-200
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Line 201-203
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.	Line 204-233
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Line 204-233
	20b	Present results of all 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.	Line 204-233
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Line 204-233
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Line 204-233
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 confidence) in the body of evidence for each outcome assessed.	Line 204-233
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Line 236-243
	23b	Discuss any limitations of the evidence included in the review.	Line 297-302
	23c	Discuss any limitations of the review processes used.	Line 297-302
	23d	Discuss implications of the results for practice, policy, and future research.	Line 303-307
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.	Line 86-87
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Line 86-87
	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.	not applicable
Competing interests	26	Declare any competing interests of review authors.	not applicable
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.	available

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: <http://www.prisma-statement.org/>

Pubmed searching strategy

#1	((((("Body Composition"[Mesh]) OR ("Intra-Abdominal Fat"[Mesh])) OR ("Subcutaneous Fat"[Mesh])) OR ("Adiposity"[Mesh])) OR ("Sarcopenia"[Mesh])) OR ("Muscle, Skeletal"[Mesh])) AND (((Hepatic venous pressure gradient[Title/Abstract]) OR ("Hypertension, Portal"[Mesh])) OR ("Hepatic Veins"[Mesh])) OR ("Portal Pressure"[Mesh]))	156
#2	(((((((pressure, portal[Title/Abstract]) OR (portal venous pressure[Title/Abstract])) OR (pressure, portal venous[Title/Abstract])) OR (venous pressure, portal[Title/Abstract])) OR (((hepatic vein[Title/Abstract]) OR (vein, hepatic[Title/Abstract])) OR (veins, hepatic[Title/Abstract])) OR (((((((portal hypertension[Title/Abstract]) OR (portal hypertensions[Title/Abstract])) OR (cruveilhier-baumgarten syndrome[Title/Abstract])) OR (cruveilhier baumgarten syndrome[Title/Abstract])) OR (syndrome, cruveilhier-baumgarten[Title/Abstract])) OR (cruveilhier-baumgarten disease[Title/Abstract])) OR (cruveilhier baumgarten disease[Title/Abstract])) OR (disease, cruveilhier-baumgarten[Title/Abstract])) OR (Hepatic venous pressure gradient[Title/Abstract])) AND (((((((((((((((muscles, skeletal[Title/Abstract]) OR (skeletal muscles[Title/Abstract])) OR (muscle, voluntary[Title/Abstract])) OR (muscles, voluntary[Title/Abstract])) OR (voluntary muscle[Title/Abstract])) OR (voluntary muscles[Title/Abstract])) OR (skeletal muscle[Title/Abstract])) OR (soleus muscle[Title/Abstract])) OR (muscle, soleus[Title/Abstract])) OR (plantaris muscle[Title/Abstract])) OR (muscle, plantaris[Title/Abstract])) OR (anterior tibial muscle[Title/Abstract])) OR (muscle, anterior tibial[Title/Abstract])) OR (tibial muscle, anterior[Title/Abstract])) OR (gastrocnemius muscle[Title/Abstract])) OR (muscle, gastrocnemius[Title/Abstract])) OR (((sarcopenias[Title/Abstract]) OR (presarcopenia[Title/Abstract])) OR (skeletal muscle index[Title/Abstract])) OR (SMI[Title/Abstract])) OR (muscle atrophy[Title/Abstract])) OR (((fats, subcutaneous[Title/Abstract]) OR (subcutaneous fats[Title/Abstract])) OR (adipose tissue, subcutaneous[Title/Abstract])) OR (fat, subcutaneous[Title/Abstract])) OR (subcutaneous adipose tissue[Title/Abstract])) OR (((((((((((((((fats, intra-abdominal[Title/Abstract]) OR (intra abdominal fat[Title/Abstract])) OR (intra-abdominal fats[Title/Abstract])) OR (fat, intra-abdominal[Title/Abstract])) OR (fat, intra abdominal[Title/Abstract])) OR (intra-abdominal adipose tissue[Title/Abstract])) OR (adipose tissue, intra-abdominal[Title/Abstract])) OR (intra abdominal adipose tissue[Title/Abstract])) OR (retroperitoneal fat[Title/Abstract])) OR (fat, retroperitoneal[Title/Abstract])) OR (fats, retroperitoneal[Title/Abstract])) OR (retroperitoneal fats[Title/Abstract])) OR (retroperitoneal adipose tissue[Title/Abstract])) OR (adipose tissue, retroperitoneal[Title/Abstract])) OR (visceral fat[Title/Abstract]) OR (fat, visceral[Title/Abstract])) OR (fats, visceral[Title/Abstract])) OR (visceral fats[Title/Abstract])) OR (abdominal visceral fat[Title/Abstract])) OR (abdominal visceral fats[Title/Abstract])) OR (fat, abdominal visceral[Title/Abstract])) OR (fats, abdominal visceral[Title/Abstract])) OR (visceral adipose tissue[Title/Abstract])) OR (adipose tissue, visceral[Title/Abstract])) OR (((body compositions[Title/Abstract]) OR (composition, body[Title/Abstract])) OR (compositions, body[Title/Abstract]))	90
#1: MeSH word search		
#2: Text word search		

Embase searching strategy

#1	'hepatic venous pressure gradient'/exp	1,042
#2	'portal vein blood pressure'/exp	6,542
#3	'portal hypertension'/exp	41,132
#4	'hepatic vein pressure gradient':ti,ab,kw OR 'porta pressure':ti,ab,kw OR 'porta vein pressure':ti,ab,kw OR 'portal blood pressure':ti,ab,kw OR 'portal pressure':ti,ab,kw OR 'portal vein pressure':ti,ab,kw OR 'portal venous pressure':ti,ab,kw OR 'pressure, portal vein':ti,ab,kw OR 'hypertension, portal':ti,ab,kw OR 'hypertension, portal vein':ti,ab,kw OR 'porta hypertension':ti,ab,kw OR 'portal congestion':ti,ab,kw OR 'portal vein hypertension':ti,ab,kw OR 'vena portae hypertension':ti,ab,kw	6,933
#5	'skeletal muscle'/exp	432,889
#6	'sarcopenia'/exp	20,474
#7	'subcutaneous fat'/exp	25,911
#8	'body composition'/exp	128,357
#9	'intra-abdominal fat'/exp	25,745
#10	'cross striated muscle':ab,ti OR 'cross striped muscle':ab,ti OR 'muscle, skeletal':ab,ti OR 'skeletal musculature':ab,ti OR 'skeleton muscle':ab,ti OR 'trunk muscle':ab,ti OR presarcopenia:ab,ti OR 'fat, subcutaneous':ab,ti OR 'panniculus adiposus':ab,ti OR 'subcutaneous adipose tissue':ab,ti OR 'subcutaneous fat tissue':ab,ti OR 'abdominal visceral adipose tissue':ab,ti OR 'abdominal visceral fat':ab,ti OR 'intra-abdominal adipose tissue':ab,ti OR 'intraabdominal adipose tissue':ab,ti OR 'intraabdominal fat':ab,ti OR 'organ adipose tissue':ab,ti OR 'organ fat':ab,ti OR 'visceral abdominal adipose tissue':ab,ti OR 'visceral abdominal fat':ab,ti OR 'visceral adipose tissue':ab,ti OR 'visceral fat':ab,ti OR 'composition, body':ab,ti	36,031
#11	#1 OR #2 OR #3 OR #4	45,318
#12	#5 OR #6 OR #7 OR #8 OR #9 OR #10	596,687
#13	#11 AND #12	379

Web of Science searching strategy

#1	TS="Hepatic venous pressure gradient" OR "hepatic vein pressure gradient" OR "portal vein blood pressure" OR "porta pressure" OR "porta vein pressure" OR "portal blood pressure" OR "portal pressure" OR "portal vein pressure" OR "portal venous pressure" OR "pressure, portal vein" OR "portal hypertension" OR "hypertension, portal" OR "hypertension, portal vein" OR "porta hypertension" OR "portal congestion" OR "portal vein hypertension" OR "vena portae hypertension"	23,028
#2	TS="skeletal muscle" OR "cross striated muscle" OR "cross striped muscle" OR "muscle, skeletal" OR "skeletal musculature" OR "skeleton muscle" OR "trunk muscle" OR "Sarcopenia" OR "presarcopenia"	226,391
#3	TS="Subcutaneous Fat" OR "fat, subcutaneous" OR "panniculus adiposus" OR "subcutaneous adipose tissue" OR "subcutaneous fat tissue" OR "intra-abdominal fat" OR "abdominal visceral adipose tissue" OR "abdominal visceral fat" OR "intra-abdominal adipose tissue" OR "intraabdominal adipose tissue" OR "intraabdominal fat" OR "organ adipose tissue" OR "organ fat" OR "visceral abdominal adipose tissue" OR "visceral abdominal fat" OR "visceral adipose tissue" OR "visceral fat" OR "body composition" OR "composition, body"	113,631
#4	#2 OR #3	325,823
#5	#1 AND #4	161

Cochrane searching strategy

Mesh word search

#1	MeSH descriptor: [Muscle, Skeletal] explode all trees	15,568
#2	MeSH descriptor: [Sarcopenia] explode all trees	835
#3	MeSH descriptor: [Adiposity] explode all trees	964
#4	MeSH descriptor: [Subcutaneous Fat] explode all trees	407
#5	MeSH descriptor: [Intra-Abdominal Fat] explode all trees	576
#6	MeSH descriptor: [Body Composition] explode all trees	7120
#7	MeSH descriptor: [Portal Pressure] explode all trees	71
#8	MeSH descriptor: [Hepatic Veins] explode all trees	115
#9	MeSH descriptor: [Hypertension, Portal] explode all trees	1374
#10	("hepatic venous pressure gradient"):ti,ab,kw (Word variations have been searched)	332
#11	("hepatic vein pressure gradient"):ti,ab,kw (Word variations have been searched)	26
#12	#10 or #11	353
#13	#1 or #2 or #3 or #4 or #5 or #6	22,925
#14	#7 or #8 or #9 or #12	1,663
#15	#13 and #14	6

Text word search

#1	(muscles, skeletal):ti,ab,kw OR (skeletal muscles):ti,ab,kw OR (muscle, voluntary):ti,ab,kw OR (muscles, voluntary):ti,ab,kw OR (voluntary muscle):ti,ab,kw (Word variations have been searched)	18,384
#2	(voluntary muscles):ti,ab,kw OR (skeletal muscle):ti,ab,kw OR (soleus muscle):ti,ab,kw OR (muscle, soleus):ti,ab,kw OR (plantaris muscle):ti,ab,kw (Word variations have been searched)	18,848
#3	(muscle, plantaris):ti,ab,kw OR (anterior tibial muscle):ti,ab,kw OR (muscle, anterior tibial):ti,ab,kw OR (tibial muscle, anterior):ti,ab,kw OR (gastrocnemius muscle):ti,ab,kw (Word variations have been searched)	1,894
#4	(muscle, gastrocnemius):ti,ab,kw (Word variations have been searched)	1,597
#5	#1 or #2 or #3 or #4	19,793
#6	(sarcopenias):ti,ab,kw OR (presarcopenia):ti,ab,kw OR (skeletal muscle index):ti,ab,kw OR (SMI):ti,ab,kw OR (muscle atrophy):ti,ab,kw (Word variations have been searched)	8,939
#7	(fats, subcutaneous):ti,ab,kw OR (subcutaneous fats):ti,ab,kw OR (adipose tissue, subcutaneous):ti,ab,kw OR (fat, subcutaneous):ti,ab,kw OR (subcutaneous adipose tissue):ti,ab,kw (Word variations have been searched)	3,239
#8	(fats, intra-abdominal):ti,ab,kw OR (intra abdominal fat):ti,ab,kw OR (intra-abdominal fats):ti,ab,kw OR (fat, intra-abdominal):ti,ab,kw OR (fat, intra abdominal):ti,ab,kw (Word variations have been searched)	1,259
#9	(intra-abdominal adipose tissue):ti,ab,kw OR (adipose tissue, intra-abdominal):ti,ab,kw OR (intra abdominal adipose tissue):ti,ab,kw OR (retroperitoneal fat):ti,ab,kw OR (fat, retroperitoneal):ti,ab,kw (Word variations have been searched)	594
#10	(fats, retroperitoneal):ti,ab,kw OR (retroperitoneal fats):ti,ab,kw OR (retroperitoneal adipose tissue):ti,ab,kw OR (adipose tissue, retroperitoneal):ti,ab,kw OR (visceral fat):ti,ab,kw (Word variations have been searched)	3,087
#11	(fat, visceral):ti,ab,kw OR (fats, visceral):ti,ab,kw OR (visceral fats):ti,ab,kw OR (abdominal visceral fat):ti,ab,kw OR (abdominal visceral fats):ti,ab,kw (Word variations have been searched)	3,066
#12	(fat, abdominal visceral):ti,ab,kw OR (fats, abdominal visceral):ti,ab,kw OR (visceral adipose tissue):ti,ab,kw OR (adipose tissue, visceral):ti,ab,kw (Word variations have been searched)	2,301
#13	#8 or #9 or #10 or #11 or #12	3,486
#14	(body compositions):ti,ab,kw OR (composition, body):ti,ab,kw OR (compositions, body):ti,ab,kw (Word variations have been searched)	23,051
#15	(pressure, portal):ti,ab,kw OR (portal venous pressure):ti,ab,kw OR (pressure, portal venous):ti,ab,kw OR (venous pressure, portal):ti,ab,kw (Word variations have been searched)	1,133
#16	(hepatic vein):ti,ab,kw OR (vein, hepatic):ti,ab,kw OR (veins, hepatic):ti,ab,kw (Word variations have been searched)	1,743
#17	(portal hypertension):ti,ab,kw OR (portal hypertensions):ti,ab,kw OR (cruveilhier-baumgarten syndrome):ti,ab,kw OR (cruveilhier baumgarten syndrome):ti,ab,kw OR (syndrome, cruveilhier-baumgarten):ti,ab,kw (Word variations have been searched)	1,815
#18	(cruveilhier-baumgarten disease):ti,ab,kw OR (cruveilhier baumgarten disease):ti,ab,kw OR (disease, cruveilhier-baumgarten):ti,ab,kw (Word variations have been searched)	0
#19	#17 or #18	1,815
#20	(Hepatic venous pressure gradient):ti,ab,kw OR (hepatic vein pressure gradient):ti,ab,kw OR (HVPG):ti,ab,kw (Word variations have been searched)	497
#21	#5 or #6 or #7 or #13 or #14	47,332
#22	#15 or #16 or #19 or #20	3,731
#23	#21 and #22	86
#23 includes two Cochrane reviews and 84 trials		

Online Resource 1.

Quality assessment based on QUADAS-2							
Study	Risk of bias				Applicability concerns		
	P	I	R	FT	P	I	R
Jeong, J. Y.(2018)	?	✓	✓	✓	?	✓	✓
Paternostro, R.(2021)	✓	✓	?	✓	✓	✓	?
Maruyama, H. (2017)	?	✓	✓	✓	?	✓	✓
Kim, T. Y. (2014)	✓	✗	?	✓	✗	✗	?
Kang, S. H. (2018)	✓	✓	✓	✓	✓	✓	✓
Matsui, T. (2022)	?	✓	✓	?	?	✓	✓
Cho, Y. S.(2021)	?	✓	✓	✓	?	✓	✓
Rodrigues, S. G.(2019)	✓	✓	✓	✓	✓	✓	✓
Xin Zeng(2023)	✓	✓	✓	✓	✓	✓	✓

Note: P = Patient Selection; I = Index Test; R = Reference Standard; FT = Flow and Timing.

✓ indicates low risk; ✗ indicates high risk; ? indicates unclear risk.

Detailed description of included studies

Study	Domain	Item	Description of decision
Jeong, J. Y.(2018)	Risk of bias	P	A consecutive or random sample was not described, but with a clear period
		I	
		R	
		FT	
Paternostro, R.(2021)	Applicability concerns	P	A consecutive or random sample was not described, but with a clear period
		I	
		R	
		FT	
Maruyama, H. (2017)	Risk of bias	P	
		I	
		R	The value of TPMT for sarcopenia definition compared with SMI was uncertain
		FT	
Kim, T. Y. (2014)	Risk of bias	P	Of 98 patients, one with paraumbilical vein was excluded due to shunt-related increase of portal venous flow(proportion less than 20%)
		I	
		R	
		FT	
	Applicability concerns	P	Thirteen patients with HCC at early stage were included, the impact of early HCC on muscle loss is uncertain
		I	
		R	
		FT	
Kim, T. Y. (2014)	Risk of bias	P	
		I	The threshold was derived from mortality with maximum

Kang, S. H. (2018)			log-rank statistic instead of a pre-specified value
		R	The value of PMTH for sarcopenia definition compared with SMI is uncertain
		FT	
	Applicability concerns	P	All included patients were non-critically-ill patients with decompensated cirrhosis
		I	The threshold was derived from mortality with maximum log-rank statistic instead of a pre-specified value
		R	The value of PMTH for sarcopenia definition compared with SMI is uncertain
	Risk of bias	P	
		I	
		R	
		FT	
Matsui, T. (2022)	Applicability concerns	P	
		I	
		R	
	Risk of bias	P	A consecutive or random sample was not described, but with a clear period
		I	
		R	
		FT	The interval was not described; liver fibrosis or cirrhosis is a chronic condition.
	Applicability concerns	P	A consecutive or random sample was not described, but with a clear period
		I	
		R	
Cho, Y. S.(2021)	Risk of bias	P	A consecutive or random sample was not described, but with a clear period
		I	
		R	
		FT	

Rodrigues, S. G.(2019)	Applicability concerns	P	A consecutive or random sample was not described, but with a clear period
		I	
		R	
	Risk of bias	P	
		I	
		R	
	Applicability concerns	FT	
		P	
		I	
		R	
Xin Zeng(2023)	Risk of bias	P	
		I	
		R	
	Applicability concerns	FT	
		P	
		I	
		R	

Note: hepatocellular carcinoma: HCC