Supplementary materials

S1. Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist.

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	1-2
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	2
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	2
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	2-3
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	3
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	2 Supplementary material 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	3 Figure 1
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming	3

		data from investigators.	
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	2-3
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	6-7
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	7

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	7
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	6
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	3 Figure 1 Supplementary material 4
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	8 Table 1
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	8 Supplementary material 5 and 6
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	9 and 10 Figure 2 and 3
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	9 and 10 Figure 2 and 3

Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	8 Supplementary material 5 and 6
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	NA
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	10-11-12-13
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	12-13
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	14

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

S2. Search strategy in PubMed, CINAHL and Scopus databases.

***Search Strategies in PubMed*:**

("Atrophic muscular disorders" OR "Muscle atrophy" OR "Muscle degeneration" OR "Muscle fiber atrophy" OR "Muscle fiber degeneration" OR "Muscle wasting" OR "Muscular wasting" OR "Muscular atrophy" OR "Muscular atrophies" OR "Muscular degeneration" OR "Sarcopenia") AND ("non-alcoholic steatosis" OR "non-alcoholic fatty liver disease" OR "fatty liver" OR "hepatic fat" OR "Liver fibrosis" OR "Liver fibrosis" OR "Liver disease" OR "Fatty liver disease" OR "Obesity") AND ("exercise" OR "physical activity" OR "exercise intervention" OR "training).

***Search Strategies in CINAHL*:**

("Atrophic muscular disorders" OR "Muscle atrophy" OR "Muscle degeneration" OR "Muscle fiber atrophy" OR "Muscle fiber degeneration" OR "Muscle wasting" OR "Muscular wasting" OR "Muscular atrophy" OR "Muscular atrophies" OR "Muscular degeneration" OR "Sarcopenia") AND ("non-alcoholic steatosis" OR "non-alcoholic fatty liver disease" OR "fatty liver" OR "hepatic fat" OR "Liver fibrosis" OR "Liver fibrosis" OR "Liver disease" OR "Fatty liver disease" OR "Obesity") AND ("exercise" OR "physical activity" OR "exercise intervention" OR "training").

Search Strategies in Scopus:

sarcopenia AND liver fatty disease AND exercise.

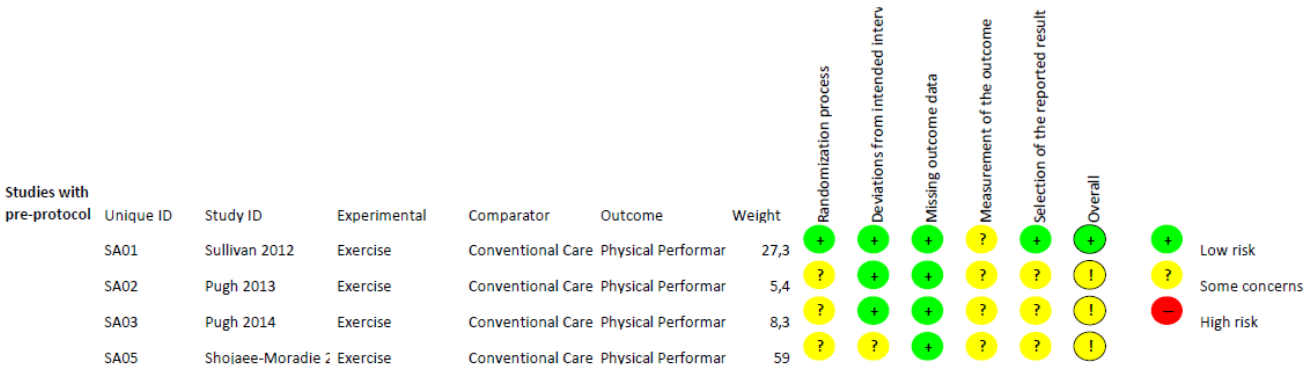
S3. Measurement of sarcopenia criteria in NAFLD patients: muscle strength, muscle mass and physical performance in clinical practice and research.

Supplementary material 3. Assessment criteria for the diagnosis of sarcopenia in NAFLD [1, 4]		
Body composition (muscular mass)	**Muscular Strength**	**Physical Performance**
Extremity circumferences (Thigh, Arm)	Handgrip strength	6-MWT (6-minute walk test)
Thigh US (ultrasound)	Knee flexion/extension	2-MST (2-minute step test)
BIA (bioelectrical impedance analysis)	Dynamometer	CPET (cardiopulmonary exercise testing)
CSA (the cross-sectional area from magnetic resonance imaging)	1 maximum repetition (1RM)	SPPB (Short physical performance Battery)
DXA (dual-energy x-ray absorptiometry)	10 maximum repetition (10RM)	Usual gait speed
Anthropometry	Isokinetic evaluation	Chair stands
MAMA (middle-arm muscle area)	Peak expiratory flow (specific to respiratory)	Timed get-up-and-go test
		Stair climb power test

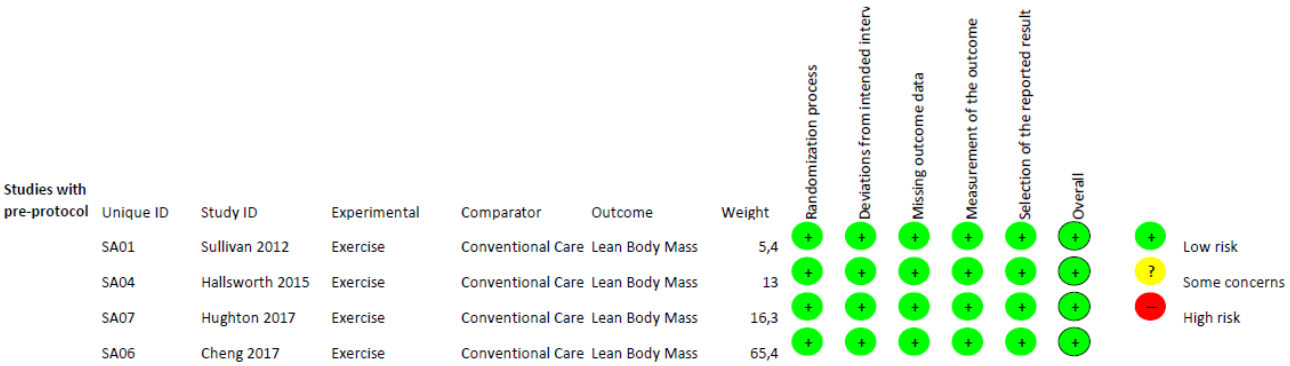
Abbreviations: US, ultrasound; BIA, bioelectrical impedance analysis; CSA, the cross-sectional area from magnetic resonance imaging; DXA, dual-energy x-ray absorptiometry; MAMA, middle-arm muscle area; 1RM, 1 maximum repetition; 10RM, 10 maximum repetition; 6-MWT, 6-minute walk test; 2-MST, 2-minute step test; CPET, cardiopulmonary exercise testing; SPPB, Short physical performance Battery.

S4. Causes for exclusion for each excluded randomised controlled trial.

Supplementary material 4. Excluded Randomized Controlled Trials (n=29)	
Excluded RCTs	**Reason for Exclusion**
Franco 2019[34]; Katsagoni 2018[35]; Axley 2017[36]; Draz 2020[37]; Abd El-Kader 2016[38]; Skrypnik 2016[39]; Yoshimura 2014[40]; Zelber-Sagi 2014[41]; Straznicky 2011[42]; George 2009[43]; Promrat 2009[44]; Winn 2018[45]; Garcia 2014[46]; Rachakonda 2017[47]; Galbreath 2018[48]	Exercise combined with another intervention or no control/placebo group (n=15)
de Piano 2012[49]; Lee 2012[50]	Subjects under 18-years-old (n = 2)
Sánchez-Muñoz 2013[51]	Article in Spanish (n = 1)
Brouwers 2018[52]; Pugh 2016[53]; Debette-Gratien 2015[54]; Devries 2008[55]; Yoo 2013[56].	Not RCT (n = 5)
Zelber-Sagi 2014[41]; Zhang 2016[57]	They do not evaluate at least 1 sarcopenia criteria (n = 2)
Abdelbasset 2020[58]; Kim 2016[59]; Zenith 2014[60]; Johnson 2009[61]	Patients with cirrhosis of another origin or with sarcopenic obesity without clearly diagnosed NAFLD or another comorbidity (n = 4)



S5. Methodological quality of the included studies in physical performance analysis. Methodological quality of the randomized controlled trials (n = 4) was assessed using the Cochrane risk of bias tool (six evaluation-critical methodological components).



S6. Methodological quality of the included studies in lean body mass (LBM) analysis. Methodological quality of the randomised controlled trials (n = 4) was assessed using the Cochrane risk of bias tool (six evaluation-critical methodological components