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Association between dietary pattern and sarcopenia in individuals with metabolic syndrome criteria: a systematic review

Asociación entre el patrón dietético y la sarcopenia en individuos con criterios de síndrome metabólico: una revisión sistemática

Dietary pattern and sarcopenia in individuals with metabolic syndrome criteria

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SUPPLEMENTARY MATERIAL 1

The strategy search used in the databases were the following:

Web of science

(TITLE-ABS-KEY ((metabolic AND syndrome) OR (obesity) OR (insulin AND resistance) OR (abdominal AND obesity) OR (diabetes AND mellitus AND type 2) OR (hypertension) OR (dyslipemias) OR (metabolic AND syndrome AND x)) AND TITLE-ABS-KEY ((sarcopenia) OR (muscle AND strength) OR (muscular AND atrophy)) AND TITLE-ABS-KEY ((dietary AND habits) OR (food AND habits) OR (feeding AND behavior) OR (dietary AND habits) OR (feeding AND patterns) OR (feeding AND pattern) OR (pattern, AND feeding))) AND (LIMIT-TO (LANGUAGE , "English") OR LIMIT-TO (LANGUAGE , "Spanish"))

Scopus

[(dietary habits OR food habits OR feeding behavior OR dietary habits OR feeding patterns OR feeding pattern OR pattern, feeding) AND (sarcopenia OR muscle strength OR muscular atrophy) AND (metabolic syndrome OR obesity OR insulin resistance OR abdominal obesity OR diabetes mellitus type 2 OR hypertension OR dyslipemias OR metabolic syndrome X)]

SUPPLEMENTARY MATERIAL 2 - PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	P1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	P 1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	P 5-6
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	P6
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	P7
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.	P7
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	P7 + supplementary material 1
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened eachrecord and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	P7-8
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they workedindependently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used inthe process.	P7-8
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain ineach study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	P7-8
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describeany assumptions made about any missing or unclear information.	P7-8
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 assessedeach study and whether they worked independently, and if applicable, details of automation tools used in the process.	P8
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.	P8
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristicsand comparing against the planned groups for each synthesis (item #5)).	P8
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or dataconversions.	P8
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	P8
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe themodel(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	P8
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	P8
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	P8
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	P8

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	P8
RESULTS			
Study selection	16 a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studiesincluded in the review, ideally using a flow diagram.	P9
	16 b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	P9-10 + supplementary material 3
Study characteristics	17	Cite each included study and present its characteristics.	P12-20
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	P10 Supplementary material 4
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 itsprecision (e.g. confidence/credible interval), ideally using structured tables or plots.	P 10-18
Results of syntheses	20 a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	P 10-18
	20 b	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.	P 10-18
	20 c	Present results of all investigations of possible causes of heterogeneity among study results.	P 10-18
	20 d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	P 10-18
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	P 10-18
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	P 10-18
DISCUSSION			
Discussion	23 a	Provide a general interpretation of the results in the context of other evidence.	P 19-20
	23 b	Discuss any limitations of the evidence included in the review.	P 20
	23 c	Discuss any limitations of the review processes used.	P 20
	23 d	Discuss implications of the results for practice, policy, and future research.	P 20
OTHER INFORMATION			
Registration and protocol	24 a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	P3 and 7
	24 b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	P3 and 7
	24 c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A

Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	P22
Competing interests	26	Declare any competing interests of review authors.	P22
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 fromincluded studies; data used for all analyses; analytic code; any other materials used in the review.	

From: Page MJ, McKenzie JE, Bossuyt PM, 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: **www.prisma-statement.org**.

SUPPLEMENTARY MATERIAL 3. EXCLUDED ARTICLES LIST

1) No relation to sarcopenia or feeding behavior (n =3)
   a) *Phase Angle Association with Dietary Habits and Metabolic Syndrome in Diabetic Hypertensive Patients: A Cross-Sectional Study, Nenadic B, 2022.*
   b) *Analysis of Dietary Factors Affecting Body Mass Index in Elderly Patients With Type 2 Diabetes Mellitus, Fukuda Yasuko et al. 2019.*
   c) *Low Physical Activity in Patients with Complicated Type 2 Diabetes Mellitus Is Associated with Low Muscle Mass and Low Protein Intake, Hagedoorn Ilse JM, 2020.*
   d) *Lifestyle factors associated with muscle quality in community-dwelling older people with type 2 diabetes in Japan and Taiwan: a cross-sectional study, Yuko Yamaguchi, 2022.*

2) It does not fit the inclusion criteria (n = 6)
   a) *Sarcopenia, obesity, and their association with selected behavioral factors in active older adults. K. Teraz, 2023*. **Relation with nutritional status instead of feeding behavior.**
   b) *The comparisons of dietary patterns, physical activity levels, obesity and muscular strength in Hispanic Americans: A three generation study, Yang Lee, 2010*. **Population under 18 years old.**
   c) *Muscular fitness, adherence to the Southern European Atlantic Diet and cardiometabolic risk factors in adolescents, C Agostinis-Sobrino, 2023.* **Population under 18 years old.**
   d) *Relationships between eating behaviors and hand grip strength among chinese adults: A population-based cross-sectional study, Ding Liang, 2020.* **The population does not have metabolic syndrome criteria**
   e) *Effect and Mechanism of the Intake Proportion of Nutrients on Handgrip Strength of Patients with Hypertension in Zhangfang Village of Fangshan District of Beijing, Wang Jia, 2017.* **Not published in Spanish or English language.**

3) Duplicated data (n=1)
   a) Shortage of energy intake rather than protein intake is associated with sarcopenia in elderly patients with type 2 diabetes: A cross-sectional study of the KAMOGAWA-DM cohort. T. Okamura, 2019.

SUPPLEMENTARY MATERIAL 4

JBI CRITICAL APPRAISAL CHECKLIST RESULTS FOR THE STUDIES INCLUDED IN THE SYSTEMATIC REVIEW

1-COHORT STUDIES

JBI CRITICAL APPRAISAL CHECKLIST FOR COHORT STUDIES

	Yes	No	Unclear	Not applicable
1. Were the two groups similar and recruited from the same population?	☐	☐	☐	☐
2. Were the exposures measured similarly to assign people to both exposed and unexposed groups?	☐	☐	☐	☐
3. Was the exposure measured in a valid and reliable way?	☐	☐	☐	☐
4. Were confounding factors identified?	☐	☐	☐	☐
5. Were strategies to deal with confounding factors stated?	☐	☐	☐	☐
6. Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	☐	☐	☐	☐
7. Were the outcomes measured in a valid and reliable way?	☐	☐	☐	☐
8. Was the follow up time reported and sufficient to be long enough for outcomes to occur?	☐	☐	☐	☐

9. Was follow up complete, and if not, were the reasons to loss to follow up described and explored? □ □ □ □

10. Were strategies to address incomplete follow up utilized? □ □ □ □

11. Was appropriate statistical analysis used? □ □ □ □

Overall appraisal: Include □ Exclude □ Seek further info □

Comments (Including reason for exclusion)

Table A. Results of JBI checklist for cohort studies.

STUDY	1	2	3	4	5	6	7	8	9	10	11	SCORE
Pereira da Silva et al. (2018)	YES	YES	YES	NO	NO	YES	YES	NO	YES	NOT APPLICABLE	YES	7/10 MODERATE RISK
Rahi et al. (2014)	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	7/11 LOW RISK
Kawamo et al. (2021)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	11/11 LOW RISK

2-RANDOMIZED CONTROLLED TRIALS

Internal Validity		Yes	No	Unclear	N/A
1	Was true randomization used for assignment of participants to treatment groups?	☐	☐	☐	☐
2	Was allocation to treatment groups concealed?	☐	☐	☐	☐
3	Were treatment groups similar at the baseline?	☐	☐	☐	☐
4	Were participants blind to treatment assignment?	☐	☐	☐	☐
5	Were those delivering the treatment blind to treatment assignment?	☐	☐	☐	☐
6	Were treatment groups treated identically other than the intervention of interest?	☐	☐	☐	☐
7	Were outcome assessors blind to treatment assignment?	Yes	No	Unclear	N/A
8	Were outcomes measured in the same way for treatment groups?	Yes	No	Unclear	N/A

9	**Were outcomes measured in a reliable way**	**Yes**	**No**	**Unclear**	**N/A**

10	**Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?**				
¡		**Yes**	**No**	**Unclear**	**N/A**

11	**Were participants analysed in the groups to which they were randomized?**				
		Yes	**No**	**Unclear**	**N/A**

12	**Was appropriate statistical analysis used?**				
		Yes	**No**	**Unclear**	**N/A**

	Yes	**No**	**Unclear**	**N/A**

13	**Was the trial design appropriate and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?**	☐	☐	☐	☐

Table B. Results of JBI checklist for randomized clinical trial.

STUDY	1	2	3	4	5	6	7	8	9	10	11	12	13	SCORE
Aparecida Silveira et al. (2020)	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES	YES	11/13 LOW RISK

3-PREVALENCE DATA STUDIES

JBI CRITICAL APPRAISAL CHECKLIST FOR STUDIES REPORTING PREVALENCE DATA

	Yes	No	Unclear	Not applicable
1. Was the sample frame appropriate to address the target population?	□	□	□	□
2. Were study participants sampled in an appropriate way?	□	□	□	□
3. Was the sample size adequate?	□	□	□	□
4. Were the study subjects and the setting described in detail?	□	□	□	□
5. Was the data analysis conducted with sufficient coverage of the identified sample?	□	□	□	□
6. Were valid methods used for the identification of the condition?	□	□	□	□
7. Was the condition measured in a standard, reliable way for all participants?	□	□	□	□
8. Was there appropriate statistical analysis?	□	□	□	□

Reviewer 9. Was the response rate adequate, and if not, was the low response rate managed appropriately? □ □ □ □

_____Date_____

Author_____Year_____ Record Number_____

Overall appraisal: Include ☐ Exclude ☐ Seek further info ☐

Table C. Results of JBI checklist for cross-sectional studies.

STUDY	1	2	3	4	5	6	7	8	9	SCORE
Marcos-Pardo et al. (2021)	YES	YES	YES	YES	YES	YES	YES	YES	YES	9/9 LOW RISK
Atkins et al. (2014)	YES	YES	YES	NO	YES	YES	YES	YES	YES	8/9 LOW RISK
Abete et al. (2019)	YES	YES	YES	YES	YES	YES	YES	YES	YES	9/9 LOW RISK
Montiel Rojas et al. (2020)	YES	YES	YES	YES	YES	NO	YES	YES	YES	8/9 LOW RISK
Cydne A, et al. (2019)	YES	YES	UNCLEAR	YES	YES	YES	YES	YES	YES	8/9 LOW RISK

Chen F, et al. (2021)	YES	YES	YES	YES	YES	YES	YES	YES	YES	9/9 LOW RISK
Lee H, et al (2019)	YES	YES	YES	YES	YES	NO	YES	YES	YES	8/9 LOW RISK
Takahashi et al. 2020	YES	YES	YES	YES	YES	NO	UNCLEAR	YES	YES	7/9 MODERATE RISK
Fanelli SM, et al. 2021	YES	YES	YES	YES	YES	YES	YES	YES	YES	9/9 LOW RISK
Rasaei N, et al. (2019)	YES	YES	UNCLEAR	YES	YES	YES	YES	YES	YES	8/9 LOW RISK
Rasaei N, et al. (2023)	YES	YES	UNCLEAR	YES	YES	YES	YES	YES	YES	8/9 LOW RISK
Lee JH, et al. (2021)	YES	YES	YES	YES	YES	YES	YES	YES	YES	9/9 LOW RISK