

Table S1. The search strategy for each database

Number	Databases	Search terms
1	Web of Science	#1 TOPIC: sarcopenia OR TOPIC: sarcopenic #2 TOPIC: Obesity OR TOPIC: sarcopenic obesity OR TOPIC: Obesity, Abdominal OR TOPIC: Body Weight #3 TOPIC: Prevalence OR TOPIC: Incidence OR TOPIC: Epidemiology OR TOPIC: frequency OR TOPIC: influence factors OR TOPIC: associated factors OR TOPIC: influencing factor OR TOPIC: affecting factor OR TOPIC: risk factor OR TOPIC: predictor OR TOPIC: relevant factor OR TOPIC: related factor OR TOPIC: causality #4#1AND#2AND#3
2	Embase	#1('sarcopenia'/exp OR 'sarcopenia') AND[embase]/lim #2 'sarcopenic':ti,ab,kw AND [embase]/lim #3 #1 OR #2

		#4 ('obesity'/exp OR 'obesity') AND [embase]/lim #5 ('sarcopenic obesity':ti,ab,kw OR 'obesity, abdominal':ti,ab,kw OR 'body weight':ti,ab,kw) AND [embase]/lim #6 #4 OR #5 #7 ('prevalence':ti,ab,kw OR 'incidence':ti,ab,kw OR 'epidemiology':ti,ab,kw OR 'frequency':ti,ab,kw OR 'influence factors':ti,ab,kw OR 'associated factors':ti,ab,kw OR 'influencing factor':ti,ab,kw OR 'affecting factor':ti,ab,kw OR 'risk factor':ti,ab,kw OR 'predictor':ti,ab,kw OR 'relevant factor':ti,ab,kw OR 'related factor':ti,ab,kw OR 'causality':ti,ab,kw) AND [embase]/lim #8 #3 AND #6 AND #7
3	Pubmed	#1 "Sarcopenia"[Mesh] #2 sarcopenic[Title/Abstract] #3 #1OR #2

		#4 "Obesity"[Mesh] #5 ((sarcopenic obesity[Title/Abstract]) OR (Obesity, Abdominal[Title/Abstract])) OR (Body Weight[Title/Abstract]) #6 #4OR#5 #7 (((((((((((Prevalence[Title/Abstract]) OR (Incidence[Title/Abstract]))) OR (Epidemiology[Title/Abstract]))) OR (frequency[Title/Abstract]))) OR (influence factors[Title/Abstract])) OR (associated factors[Title/Abstract])) OR (influencing factor[Title/Abstract])) OR (affecting factor[Title/Abstract])) OR (risk factor[Title/Abstract])) OR (predictor[Title/Abstract])) OR (relevant #8 #3AND#6 AND #7
4	Cochrane library	#1 MeSH descriptor: [Sarcopenia] explode all trees #2 (sarcopenic):ti,ab,kw #3 #1 or #2

		#4 MeSH descriptor: [Obesity] explode all trees #5 (sarcopenic obesity OR Obesity, Abdominal OR Body Weight):ti,ab,kw #6 #4 or #5 #7 (Prevalence OR Incidence OR Epidemiology OR frequency OR influence factors OR associated factors OR influencing factor OR affecting factor OR risk factor or predictor OR relevant factor OR related factor or causality):ti,ab,kw #8 #3 AND #6AND#7
5	CINAHAL	#1 SU "Sarcopenia" OR TI (sarcopenia or sarcopenic) OR AB (sarcopenia or sarcopenic) #2 SU "Obesity" OR TI (Obesity or sarcopenic obesity or Obesity, Abdominal or Body Weight) OR AB (Obesity or sarcopenic obesity or Obesity, Abdominal or Body Weight) #3 TI (Prevalence or Incidence or Epidemiology or frequency or influence factors or associated factors or influencing factor or affecting factor or risk factor or predictor or relevant factor or related factor or causality) OR AB (Prevalence or Incidence or Epidemiology or frequency or

		influence factors or associated factors or influencing factor or affecting factor or risk factor or predictor or relevant factor or related factor or causality) #4#1AND#2AND#3
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Table S2. The basic characteristics and quality evaluation results of the included literature

Author (year)	Country	Study design	Age (years)	Sample size (M/F)	Assessment method for muscle mass	Definition of SO	Prevalence (%) SO (M/F)	Associated factors	Prognosis	Quality assessment
Jang W (2023) ^[23]	Korea	Cross-sectional study	≥65	3690(1645/2045)	/	Grip strength and WC	11.92%(6.63% / 16.19%)	1,2,3,4,5,7,14	/	8
Hwang J (2023) ^[24]	Korea	Cross-sectional study	75-84	813(325/488)	DXA	EWGSOP and WC	16.48%(16.31% / 16.60%)	/	/	7
de Campos G C (2020) ^[8]	Brazil	Cross-sectional study	≥65	270(81/189)	DXA	EWGSOP and BF	29.30%(33.33% / 27%)	10,5,6,7	/	8
Park M (2025) ^[7]	Korea	Cross-sectional study	≥65	2118(1003/1115)	DXA	AWGS and WC	3.54%(5.88% / 1.43%)	2,3,4,5,6,10, 11,12,13,14,15	/	6
Yang C W (2015) ^[25]	China	Cross-sectional study	≥65	844(448/396)	DXA	EWGSOP and BF	7.23%(7.37% / 7.07%)	1	/	8
Choi S (2024) ^[26]	Korea	Cross-sectional study	70-84	2071(1030/1041)	DXA	ESPEN and EASO guidelines	9.56%(8.74% / 10.37%)	8	/	7
Lu L (2022) ^[27]	China	Cross-sectional study	≥65	1407(581/826)	BIA	AWGS and BF	9.95%(13.94% / 7.14%)	1,11,15,16	/	7
Kim S (2024) ^[28]	Korea	Cross-sectional study	≥65	5458(2391/3067)	/	Grip strength and WC	13.98%(8.62% / 18.16%)	/	/	7
Ryu M (2013) ^[29]	Korea	Cross-sectional study	≥65	2264(940/1324)	DXA	SMI and WC	7.46%(7.45% / 7.48%)	8	/	7

Table S2. Cont

Auther (year)	Country	Study design	Age (years)	Sample size (M/F)	Assessment method for muscle mass	Definition of SO	Prevalence (%) SO (M/F)	Associated factors	Prognosis	Quality assessment
Park H Y (2021) ^[30]	Korea	Cross-sectional study	≥65	3573(1533 /2040)	DXA	SMI and BF	4.62%(4.11% / 5.00%)	8	/	7
Santos C M (2017) ^[31]	Brazil	Cross-sectional study	≥65	1373(490/883)	/	Grip strength and BMI	4.44%(3.27% / 5.08%)	/	/	7
Moreno-Franco B (2018) ^[32]	Spain	Cross-sectional study	≥65	1730(808/922)	BIA	SMI and BF	17.23%(18.19% / 16.38%)	1,3	/	7
Jung S (2024) ^[33]	Korea	Cross-sectional study	70-84	950(459/491)	DXA	AWGS and WC	9.79%(10.89% / 8.76%)	/	/	7
Hwang B (2012) ^[34]	Korea	Cross-sectional study	≥60	2221(964/1257)	DXA	SMI and WC	6.80%(6.12% / 7.32%)	2,4,5,6,14	/	6
Zhou Y (2025) ^[35]	China	Cross-sectional study	≥60	487(204/283)	BIA	AWGS and WC or BMI	10.06%(5.88%/13.07%)	1,2,17	12	8
Yang J (2024) ^[9]	China	Cross-sectional study	≥60	2821(1398/1423)	BIA	AWGS and BF	3.23%(3.58%/2.88%)	/	5,7,8,11	7
Son J (2019) ^[36]	Korea	Cross-sectional study	≥65	3367	DXA	SMI and WC	21.92%	7,8,12,13	/	5
Park J E (2023) ^[10]	Korea	Cross-sectional study	≥65	2971(1275/1696)	DXA	AWGS and WC	4.44%(4.86% / 4.13%)	7,12,13	/	7

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Oh C (2015) ^[11]	Korea	Cross- sectional study	≥60	1433(658/775)	DXA	SMI and BMI	25.82%(19.60%/31.10%)	/	/	7
Oh C (2017) ^[37]	Korea	Cross- sectional study	≥60	4452(1929/2523)	DXA	SMI and BMI	21.83%	7,12	/	7
Murawiak M (2022) ^[38]	Poland	Cross- sectional study	≥60	211(84/127)	BIA	EWGSOP and BF	7.11%(5.95% / 7.87%)	/	9	6
Morikawa M (2023) ^[21]	Japan	Cohort study	≥65	4197(1922/2275)	BIA	AWGS and BF or VF	2.07%(1.61%/ 2.46)	/	2,3,8,11	7
Lim H S (2018) ^[39]	Korea	Cross- sectional study	≥65	3492(1850/1642)	DXA	SMI and WC	23.25%(17.08% /30.21%)	/	11	7
Lee D Y (2023) ^[40]	Korea	Cross- sectional study	≥65	2661	DXA	AWGS and WC	6.73%	Coffee	/	7
Diago- Galmés A (2023) ^[41]	Spain	Cross- sectional study	≥65	202(38/164)	BIA	EWGSOP and BF or BMI or WC or TS	18.81%(28.95% / 16.46%)	/	/	8
Chen F (2021) ^[42]	China	Cross- sectional study	≥60	3795	BIA	SMI and WC	3.50%	Eating patterns	/	8

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Moon J H (2015) ^[43]	Korea	Cross- sectional study	≥65	1583(635/948)	DXA	SMI and BMI	8.91%(7.87% / 9.60%)	/	4	8
Ishii S (2016) ^[44]	Japan	Cross- sectional study	≥65	1731(875/856)	BIA	SMI and BF	3.70%(3.66% / 3.74%)	/	8	7
Du Y (2019) ^[45]	China	Cross- sectional study	≥65	631(213/418)	BIA	AWGS and BMI	3.96%(6.98% /2.39%)	11	3,11	8
Rossi A P (2020) ^[22]	Italy	Cohort study	68-78	274(97/177)	DXA	SMI and BF	8.03%(8.25% / 7.91%)	/	10	7
Peng T C (2021) ^[46]	China	Cross- sectional study	≥65	765	BIA	EWGSOP and BMI or WC or BF	3.79%	/	1	6
Peng L (2025) ^[47]	China	Cross- sectional study	≥60	5320(2973/2347)	/	AWGS and BMI or WC	14.26%(9.15% / 20.75%)	/	5	7
Lee S E (2020) ^[48]	Korea	Cross- sectional study	≥60	3044	/	EWGSOP and BMI	3.45%	/	4	8
Kong H H (2020) ^[49]	Korea	Cross- sectional study	70-84	2303(1091/1212)	DXA	SMI and WC	5.34%(3.85% / 6.68%)	/	6	7

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Author (year)	Country	Study design	Age (years)	Sample size (M/F)	Assessment method for muscle mass	Definition of SO	Prevalence (%) SO (M/F)	Associated factors	Prognosis	Quality assessment
Wang H (2019) ^[50]	China	Cross- sectional study	60-92	945(465/480)	BIA	AWGS and BF	6.03%(7.31% / 4.79%)	/	5	7
Song G Y (2025) ^[6]	Korea	Cross- sectional study	≥65	1387(635/752)	BIA	AWGS and BMI	1.08%(0.79% / 1.33%)	/	6, 7	8
Baek S J (2014) ^[51]	Korea	Cross- sectional study	≥65	3483(1466/2017)	DXA	SMI and BMI	1.78%(2.18% / 1.49%)	/	11	5

Abbreviations: SO: Sarcopenic Obesity; M: Male; F: Female; BIA: Bioelectrical Impedance Analysis; DXA: Dual-energy X-ray Absorptiometry; AWGS: Asian Working Group for Sarcopenia; EWGSOP: European Working Group on Sarcopenia in Older People; ESPEN: European Society for Clinical Nutrition and Metabolism; EASO: European Association for the Study of Obesity; SMI: Skeletal Muscle Index; WC: Waist Circumference; BF: Body Fat Percentage; TS: Triceps Skinfold Thickness; VF: Visceral Fat; BMI: Body Mass Index.

Influencing factors:1. Age ≥ 75 years; 2. Rural residence; 3. Low education level; 4. Low income; 5. Smoking; 6. Alcohol consumption; 7. Low physical activity; 8. Moderate to high physical activity; 9. Chronic diseases; 10. Male; 11. Inadequate protein intake; 12. Inadequate energy intake; 13. Unemployed; 14. Sleep duration > 9 hours; 15.BMI; 16. Female.

Prognosis:1. Falls; 2. Disability; 3. Osteoporosis; 4. Decline in pulmonary function; 5. Cognitive impairment; 6. Decline in physical function; 7. Decline in quality of life; 8. Negative mood; 9. Malnutrition; 10. High risk of hospitalization; 11. Complications; 12. Mortality.

Table S3. Univariate meta-regression analysis

Covariates	Coefficient	95%CI	<i>P</i> value	<i>I</i> ² _{res}	Adj <i>R</i> ²
Country					
Developing countries(ref)	0.00				
Developed countries	0.15	-0.50-0.80	0.639	99.99%	-2.20%
Region					
Asia(ref)	0.00				
Europe	0.55	-0.74-1.85	0.392	99.99%	-0.70%
South America	0.56	-0.38-1.50	0.233	99.99%	1.31%
Gender					
Female(ref)	0.00				
Male	-0.07	-0.54-0.40	0.773	99.98%	-1.55%
Study design					
Cohort study(ref)	0.00				
Cross-sectional study	0.68	-0.62-1.97	0.296	99.99%	0.36%
Assessment method for muscle mass					
BIA(ref)	0.00				
DXA	0.49	-0.08-1.06	0.090	99.99%	5.35%
Diagnostic criteria of sarcopenia					
AWGS(ref)	0.00				
EWGSOP	0.33	-0.42-1.08	0.373	99.99%	-0.52%
Other	0.34	-0.25-0.92	0.250	99.99%	1.01%
Diagnostic criteria of obesity					
BMI(ref)	0.00				
WC	0.24	-0.38-0.85	0.443	99.99%	-1.12%
BF	0.09	-0.56-0.74	0.783	99.99%	-2.64%
WC/BMI	0.55	-0.75-1.85	0.399	99.99%	-0.76%