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RESEARCH

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Evaluation of sarcopenia diagnosis strategies in Chinese community-dwelling older adults based on the 2019 Asian Working Group guidelines: a cross-sectional study

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Abstract

Background Most diagnostic studies on sarcopenia in Asia follow the 2019 Asian Working Group for Sarcopenia (AWGS) guidelines, which recommend distinct diagnostic strategies for community and hospital settings due to challenges in measuring muscle mass in community environments. This study evaluates the screening-to-diagnosis process in community-based preventive services.

Methods This cross-sectional study utilized a questionnaire survey to evaluate SARC-F and SARC-CalF. Measurements included calf circumference (CC), handgrip strength, gait speed and bioelectrical impedance analysis (BIA). Participants were diagnosed according to the AWGS 2019 criteria. Four scenarios simulating the screening-to-diagnosis process in a community setting were evaluated. Sensitivity, specificity, and the area under the ROC curve (AUC) were calculated to assess diagnostic performance.

Results A total of 2453 community-dwelling older adults aged ≥60 years were included. The prevalence of sarcopenia was 14.1% (345/2453), with rates of 15.4%(160/1038) in males and 13.1% (185/1415) in females. In the simulated diagnostic scenarios, the number of confirmed cases was 218 (combination,Scenario1), 211 (CC,Scenario2), 60 (SARC-CalF,Scenario3) and 21 (SARC-F,Scenario4), respectively. In the case-finding step, the sensitivity for Scenarios1 to 4 was 0.86,0.84,0.23 and 0.07, respectively; specificity was 0.57,0.58,0.93 and 0.99, respectively; and the AUCs were 0.717,0.710,0.581 and 0.530, respectively. In the assessment step, the sensitivity for Scenarios 1 to 4 was 0.73,0.73,0.74 and 0.88, respectively; specificity was 0.81,0.82,0.68 and 0.24, respectively; and the AUCs were 0.774,0.774,0.712 and 0.557,respectively. The integrated sensitivity of the case-finding and assessment steps for Scenarios 1 to 4 was 0.63,0.61,0.17 and 0.06, respectively; integrated specificity was 0.92,0.92,0.98 and 0.99, respectively; and integrated AUCs were 0.776,0.768,0.575 and 0.523, respectively. The diagnostic performance of the entire procedure was better in females than in males.

Conclusions In the case-finding step, the CC tool demonstrated superior performance compared to the combination tool, SARC-CalF, and SARC-F. In the assessment step, the muscle strength test was consistently performed with stability. The integrated performances of the case-finding and assessment steps exhibited moderate accuracy

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in Scenarios 1 and 2, but low accuracy in Scenarios 3 and 4. There is a pressing need to develop more accurate and user-friendly tools to improve sarcopenia detection among community-dwelling older adults in China.

Keywords Sarcopenia, Diagnosis, Screening, Community, Sensitivity, Specificity, ROC, AUC

Background

Sarcopenia, characterized by the loss of skeletal muscle mass, strength, and function [1–3], is a common health concern among older adults, leading to functional decline and adverse health outcomes [4–6]. The prevalence of sarcopenia in Asia has been reported to range from 5.5% to 25.7% in community-dwelling older adults [7, 8], with the pooled prevalence being 12.9% (95%CI:10.7–15.1%) and 11.2% (95%CI:8.9–13.4%) for men and women, respectively [9]. With three times higher average cost of health care related to an individual with sarcopenia than an individual without sarcopenia [10], the burden of outcomes related to sarcopenia affects both the individual and societal levels [11]. For the reversibility of sarcopenia, greater efforts are needed for earlier diagnosis and more effective management [11].

The Asian Working Group for Sarcopenia (AWGS) 2019 update proposes separate algorithms for community and hospital settings to facilitate earlier identification of people at risk for sarcopenia [3]. In community preventive services settings, sarcopenia identification is recommended through three steps including case-finding, assessment, and diagnosis, and each step is critical to the identification of sarcopenia. Calf circumference (CC), SARC-F and SARC-CalF are recommended for sarcopenia screening in the case-finding step. Muscle strength or physical performance tests are recommended in the assessment step, individuals with low muscle strength, with or without reduced physical performance, are defined as possible sarcopenia cases. Individuals with possible sarcopenia are encouraged to adopt lifestyle interventions and be referred to hospitals for confirmatory diagnosis, which requires a combination of muscle strength, physical performance and appendicular skeletal muscle mass(ASM) [3]. From the screening to diagnosis, the performance of each step will influence the final identification of sarcopenia cases, with only individuals who screen positive in the previous step proceeding to the next step.

The screening ability of CC, SARC-F and SARC-CalF has been identified by previous studies: CC has moderate-to-high sensitivity and specificity, SARC-F has low sensitivity and high specificity, SARC-CalF improved the sensitivity of SARC-F by incorporating CC [12–14]. However, as a comprehensive procedure from screening to assessment to diagnosis in community settings according to AWGS2019, there has been no evaluation of the overall process that takes into account the accuracy of each step.

In the study, all participants were directly diagnosed with or without sarcopenia according to the AWGS 2019 criterion, and four additional scenarios were simulated to determine how many cases of sarcopenia would be identified if participants underwent the community-based process, which included screening, assessment, and diagnosis steps, and to evaluate the performance of the entire procedure. Four scenarios were simulated: one for each of the three recommended screening tools in the case-finding step, and an additional combined-use scenario where a positive result from any of the three tools was considered positive, aiming to achieve the highest sensitivity possible with the recommended tools and identify more cases of sarcopenia.

Methods

Study design and population

The study was a diagnostic cross-sectional study conducted in Pudong New Area, Shanghai, China. A two-stage random sampling framework, clustered by location and community characteristics, was employed for sample selection. In the first stage, 2 towns were selected from each stratum based on location (suburban vs urban). In the second stage, 1 senior living community or 1 general community was sampled from the towns selected in the first stage. Study participants aged 60 years or older were consecutively recruited between May 2023 and October 2023. The exclusion criteria were as follows: inability to provide information, inability to walk, and other conditions that precluded cooperation with physical measurements. The questionnaires and all measurements were performed by a trained team comprising qualified physical therapists and clinical research coordinators.

Questionnaire survey

Covariates

The questionnaire survey was conducted through face-to-face interviews to collect demographic and clinical characteristics, including age, sex, and history of chronic disease. Further details regarding the questionnaire are provided in Supplement 1.

SARC-F and SARC-CalF

The standard SARC-F questionnaire consists of five items assessing strength, assistance in walking, ability to rise from a chair, ability to climb stairs, and history of falls. Each item is scored from 0 to 2, with higher scores indicating a greater likelihood of sarcopenia [15]. The SARC-CalF tool retains the first five items and their scoring system from the SARC-F but includes an additional sixth item: calf circumference (CC). The CC item is scored dichotomously: 0 points if CC exceeds the predefined cut-off and 10 points if below.For sarcopenia screening, total scores≥4 on SARC-F or ≥11 on SARC-CalF are considered positive [3, 12, 15].

Measurements

Calf circumference

Calf circumference (CC) was measured twice on either the left or right calf while the participant was seated, and the larger value was recorded. The AWGS 2019 guidelines recommend sex-specific cut-offs for CC: <34 cm for males and <33 cm for females [3]. Values below these thresholds indicate a positive screening result.

Muscle strength

Handgrip strength (HGS) was assessed using a digital handgrip dynamometer (EH106, Kangdu Medical Equipment Co., Ltd, Beijing, China).The dominant hand was tested twice, with a 30-second interval between tests, and the higher value was recorded as the HGS. Sex-specific cut-offs for HGS are <28 kg for males and <18 kg for females, with values below these thresholds indicating a positive screening result.

Physical performance

Physical performance was evaluated based on usual gait speed. Participants were asked to walk 6 meters at their usual pace twice, and the faster speed was recorded. The cut-off value for gait speed is <1.0 m/s. A gait speed below this cut-off indicates a positive screen for sarcopenia.

Appendicular skeletal muscle mass (ASM)

ASM was assessed using a bioelectrical impedance analysis (BIA) device (Inbody 270, Biospace Co. Ltd., Seoul, Korea), which is height-adjusted for sarcopenia diagnosis. The ASM cut-off values are <7.0 kg/m^2 for males and <5.7 kg/m^2 for females.An ASM measurement below the respective cut-off indicates a positive screen for sarcopenia.

Diagnosis of sarcopenia

The diagnosis of sarcopenia was conducted according to the AWGS 2019 criteria. Based on the cut-offs of the measurement instruments listed above, individuals with positive ASM combined with either positive muscle strength or physical performance were confirmed as having sarcopenia(ASM+ and muscle strength+ or physical performance+) or severe sarcopenia(ASM+, muscle strength+, and physical performance+).

In the study, the number of diagnosed cases was calculated as if the diagnostic procedure were conducted in a community preventive service setting following the AWGS 2019 guidelines. Four scenarios were simulated based on the different instruments used in case-finding stage. Individuals were assumed to be screened by either CC (Scenario 2), SARC-CalF (Scenario 3), or SARC-F (Scenario 4) alone, or in combination (Scenario 1: if any of the three screening tools tested positive, the result was considered positive). Those who screened positive in the case-finding step proceeded to the assessment step. In the assessment step, individuals who tested positive for muscle strength were identified as having possible sarcopenia. Assuming that all individuals with possible sarcopenia were referred to a hospital for confirmatory diagnosis, those with positive ASM were eventually identified as having sarcopenia. Among the sarcopenia cases, those with a positive 6-metre walk test were confirmed as having severe sarcopenia.

Statistical analyses

Descriptive statistics were reported as numbers (percentage) for categorical variables. Continuous variables were described as mean ± standard deviation or median(IQR). To compare the differences between groups, the χ^2 test, Mann-Whitney test were used for data feature.

To evaluate the performance of different screening and diagnostic instruments and stages, sensitivity, specificity, receiver operating characteristics (ROC) curve and the area under the ROC curve(AUC) were calculated and plotted to assess the diagnostic accuracy. A p value <0.05 was considered statistically significant. All statistical analyses were performed using R software (version4.3.3;R Project for Statistical Computing).

Results

Participant characteristics

A total of 2,528 participants signed informed consent and 2,481 effective questionnaires were collected, along with measurements of calf circumference, handgrip strength and gait speed. Additionally, 2,502 participants completed ASM measurement. Based on project ID, 2,453 participants were successfully matched and included in the analyses. These 2,453 participants were diagnosed for sarcopenia according to the AWGS 2019 criteria and four scenarios were simulated from screening to diagnosis as if the diagnosis procedure was conducted in a community

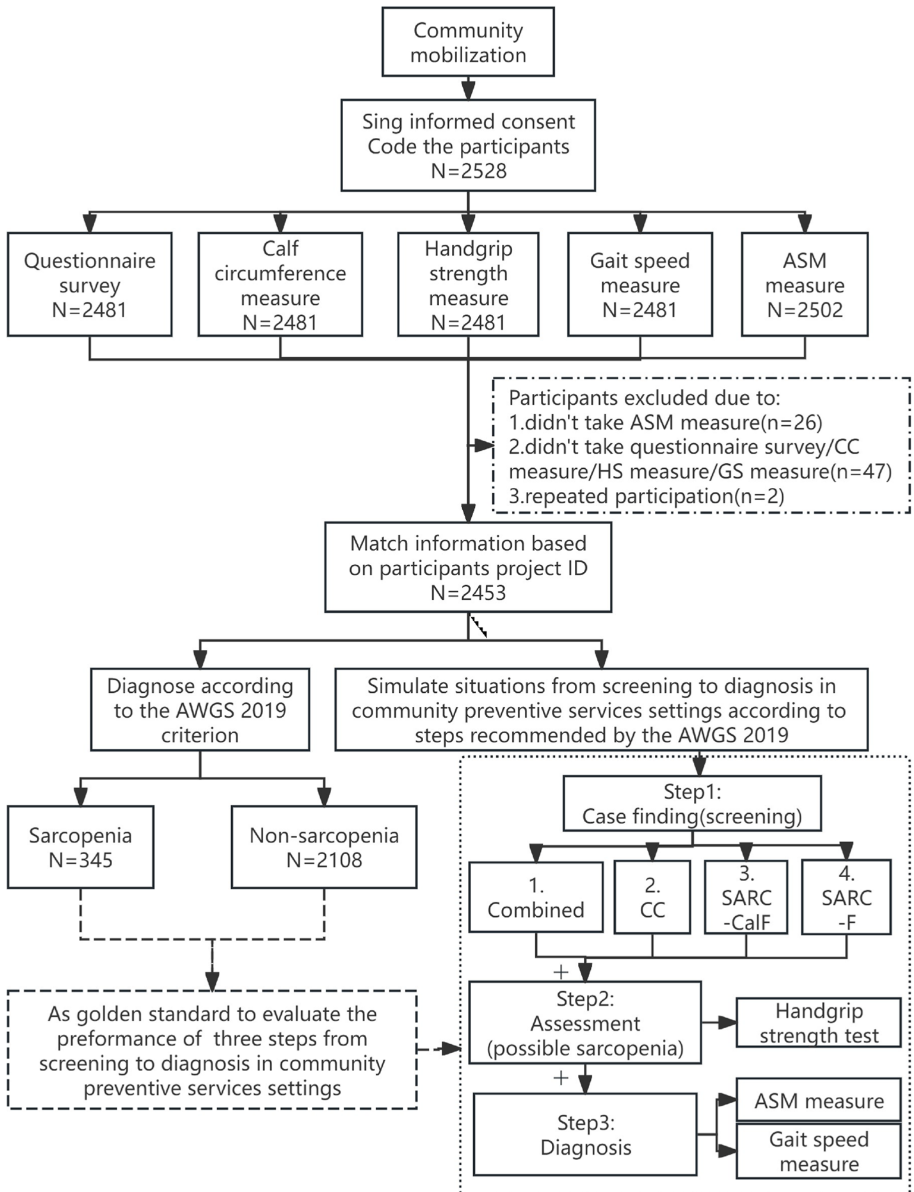

Fig. 1 Procedure of the study

setting, as recommended by AWGS 2019. The procedure is shown as Fig. 1.

A total of 1,038 males and 1,415 females were included in the analysis, with a mean age of 72.5±6.2 years for all participants. The mean age for males was 72.5±6.3 years, and for females, it was 72.4±6.2 years. The mean BMI for all participants was 24.6±3.4 kg/m^2, with 24.4±3.2 kg/m^2 for males and 24.6±3.6 kg/m^2 for females. The demographic and clinical characteristics are shown in Table 1.

Measurements

The median (IQR) of calf cricumference, handgrip strength, gait speed, ASM, SARC-F and SARC-CalF scores are presented in Table 2. The mean SARC-F score for all participants was 0.30±0.85, with scores of 0.16±0.62 for males and 0.40±0.97 for females. The mean SARC-CalF score was 5.96±5.07 for all participants, with scores of 5.48±5.05 for males and 6.30±5.06 for females.

Table 1 Characteristics of participants

Characteristics	Total, $N = 2{,}453$[1]	Male, $N = 1{,}038$[1]	Female, $N = 1{,}415$[1]	*p*-value[2]
Age(year)	71.5 (8.3)	71.5 (8.1)	71.5 (8.6)	0.969
BMI(kg/m^2)	24.3 (4.4)	24.3 (4.0)	24.4 (4.5)	0.386
Chronic Disease(Yes)	1,837 (75%)	772 (74%)	1,065 (75%)	0.615
Hypertension(Yes)	1,316 (54%)	548 (53%)	768 (54%)	0.467
Diabetes(Yes)	425 (17%)	204 (20%)	221 (16%)	0.009
Malignancy(Yes)	75 (3.1%)	30 (2.9%)	45 (3.2%)	0.680
Osteoporosis(Yes)	73 (3.0%)	14 (1.3%)	59 (4.2%)	<0.001
COPD(Yes)	20 (0.8%)	14 (1.3%)	6 (0.4%)	0.012
Chronic kidney disease(Yes)	17 (0.7%)	5 (0.5%)	12 (0.8%)	0.280

[1] n (%); Median (IQR)

[2] Pearson's Chi-squared test; Wilcoxon rank sum test

Table 2 Results of physical measurements, SARC-F and SARC-CalF

Characteristics	Overall, $N = 2{,}453$[1]	Male, $N = 1{,}038$[1]	Female, $N = 1{,}415$[1]	*p*-value[2]
Calf circumference,cm	33.00(3.50)	34.00(4.00)	33.00(3.50)	<0.001
Handgrip strength,kg	24.30(10.70)	31.80(8.90)	21.20(6.00)	<0.001
Gait speed,m/s	1.12(0.17)	1.14(0.20)	1.11(0.17)	<0.001
ASM(BIA,kg/m^2)	6.60(1.30)	7.40(1.10)	6.10(0.90)	<0.001
SARC-F score	0.00(0.00)	0.00(0.00)	0.00(0.00)	<0.001
SARC-CalF score	10.00(10.00)	10.00(10.00)	10.00(10.00)	<0.001

[1] Median(IQR)

[2] Wilcoxon rank sum test

Table 3 Diagnostic of sarcopenia

Characteristics	Overall, $N = 2{,}453$[1]	Male, $N = 1{,}038$[1]	Female, $N = 1{,}415$[1]	*p*-value[2]
AWGS 2019 Criteria Classification	345 (14.1%)	160 (15.4%)	185 (13.1%)	0.100
AWGS 2019 Criteria Classification(grade)				**0.024**
Non-sarcopenia	2,108 (85.9%)	878 (84.6%)	1,230 (86.9%)	
Sarcopenia	203 (8.3%)	104 (10.0%)	99 (7.0%)	
Severe sarcopenia	142 (5.8%)	56 (5.4%)	86 (6.1%)	

[1] n (%)

[2] Pearson's Chi-squared test

Diagnosis of sarcopenia

Diagnosis according to AWGS 2019 criteria

According to the AWGS 2019 diagnostic criteria, 345 (14.1%) participants were diagnosed with sarcopenia, including 160 (15.4%) males and 185 (13.1%) females as shown in Table 3. Among those diagnosed with sarcopenia, a higher proportion of females (86/185 = 46.5%) had severe sarcopenia compared to males (56/160 = 35.0%). The characteristics of sarcopenia and non-sarcopenia can be found in Supplement 2 (eTable. 1).

Simulating scenarios from case-finding to diagnosis following strategies for community setting recommended by AWGS 2019

The number of positive cases at each step is shown in Fig. 2. When the three instruments were combined (Scenario 1), a total of 218 cases were confirmed. When using calf circumference (CC) (Scenario 2), SARC-CalF (Scenario 3), or SARC-F alone (Scenario 4), 211, 60, and 21 cases were confirmed, respectively. The sex-specific diagnosis results are presented in Supplement 2 (eFig. 1 and eFig. 2).

The sensitivity, specificity, ROC, and AUC of case-finding, assessment, and the combined case-finding with

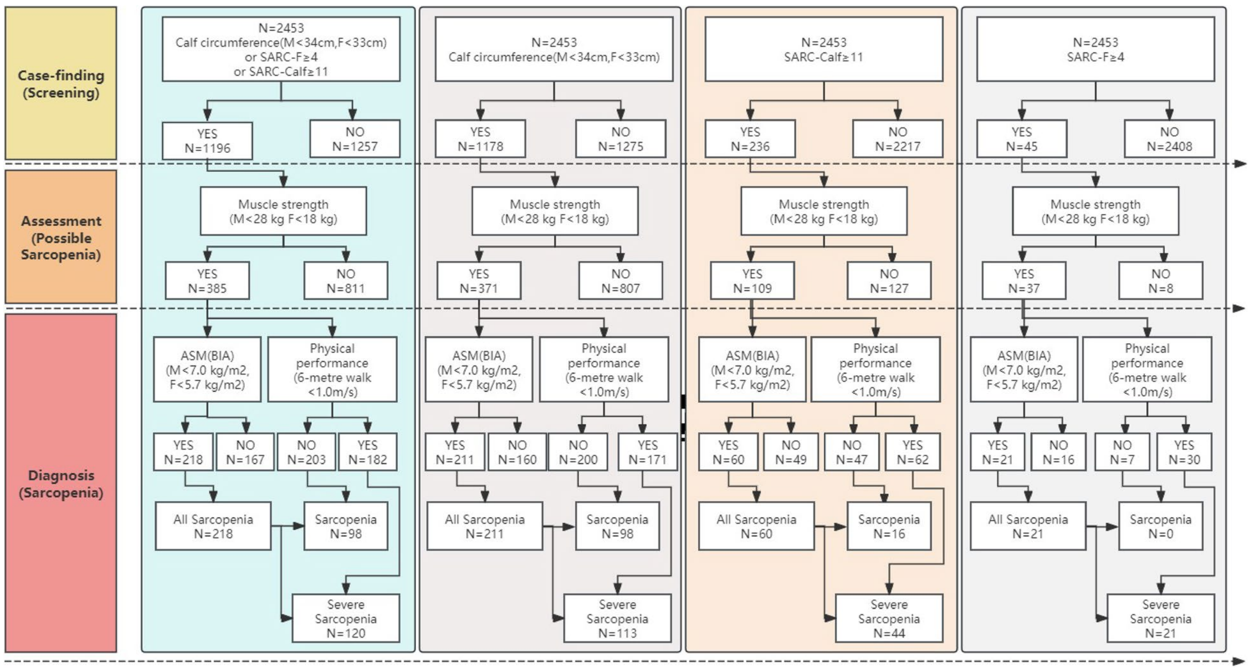

Fig 2 Simulation scenarios from case-finding to diagnosis of sarcopenia in community setting with different screening tool

Table 4 The sensitivity and specificity of different steps for 4 simulation scenarios

Simulation scenario	Stage		Total	Sarcopenia (+)	Non-sarcopenia(-)	Se	Sp
1	Case_finding with SARC-F or SARC-CalF or CC	+	1196 (48.8)	297 (86.1)	899 (42.6)	0.86	0.57
		-	1257 (51.2)	48 (13.9)	1209 (57.4)		
	Assessment with handgrip strength	+	385 (32.2)	218 (73.4)	167 (18.6)	0.73	0.81
		-	811 (67.8)	79 (26.6)	732 (81.4)		
	Case_finding +Assessment (Possible sarcopenia)	+	385 (15.7)	218 (63.2)	167 (7.9)	0.63	0.92
		-	2068 (84.3)	127 (36.8)	1941 (92.1)		
2	Case_finding with CC	+	1178 (48.0)	290 (84.1)	888 (42.1)	0.84	0.58
		-	1275 (52.0)	55 (15.9)	1220 (57.9)		
	Assessment with handgrip strength	+	371 (31.5)	211 (72.8)	160 (18.0)	0.73	0.82
		-	807 (68.5)	79 (27.2)	728 (82.0)		
	Case_finding +Assessment (Possible sarcopenia)	+	371 (15.1)	211 (61.2)	160 (7.6)	0.61	0.92
		-	2082 (84.9)	134 (38.8)	1948 (92.4)		
3	Case_finding with SARC-CalF	+	236 (9.6)	81 (23.5)	155 (7.4)	0.23	0.93
		-	2217 (90.4)	264 (76.5)	1953 (92.6)		
	Assessment with handgrip strength	+	109 (46.2)	60 (74.1)	49 (31.6)	0.74	0.68
		-	127 (53.8)	21 (25.9)	106 (68.4)		
	Case_finding +Assessment (Possible sarcopenia)	+	109 (4.4)	60 (17.4)	49 (2.3)	0.17	0.98
		-	2344 (95.6)	285 (82.6)	2059 (97.7)		
4	Case_finding with SARC-F	+	45 (1.8)	24 (7.0)	21 (1.0)	0.07	0.99
		-	2408 (98.2)	321 (93.0)	2087 (99.0)		
	Assessment with handgrip strength	+	37 (82.2)	21 (87.5)	16 (76.2)	0.88	0.24
		-	8 (17.8)	3 (12.5)	5 (23.8)		
	Case_finding +Assessment (Possible sarcopenia)	+	37 (1.5)	21 (6.1)	16 (0.8)	0.06	0.99
		-	2416 (98.5)	324 (93.9)	2092 (99.2)		

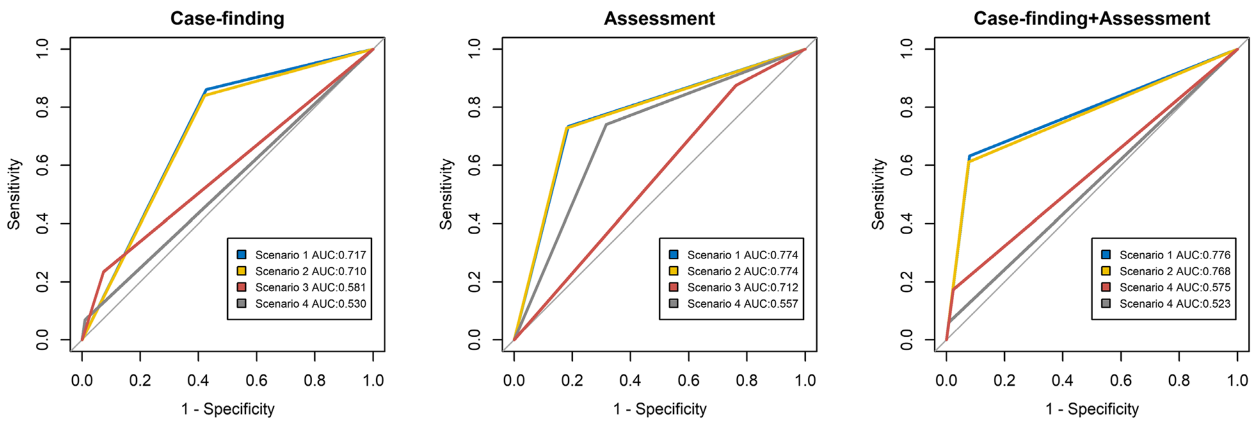

Fig. 3 ROC and AUC of different steps for 4 simulation scenarios

assessment are provided in Table 4 and Fig. 3. The sensitivity of the combination (Scenario 1), CC (Scenario 2), SARC-CalF (Scenario 3), and SARC-F (Scenario 4) were 0.86, 0.84, 0.23, and 0.07, respectively. The specificity was 0.57, 0.58, 0.93, and 0.99, respectively. The AUCs were 0.717, 0.710, 0.581, and 0.530, respectively. In the assessment step, the sensitivity for the four scenarios was 0.73, 0.73, 0.74, and 0.88, respectively. The specificity was 0.81, 0.82, 0.68, and 0.24, respectively. The AUCs were 0.774, 0.774, 0.712, and 0.557, respectively. The combined sensitivity of case-finding and assessment for the four scenarios was 0.63, 0.61, 0.17, and 0.06, respectively. The specificity was 0.92, 0.92, 0.98, and 0.99, respectively. The AUCs were 0.776, 0.768, 0.575, and 0.523, respectively. The sex-specific sensitivity, specificity, ROC, and AUC are presented in Supplement 2 (eTable 2, eTable 3, eFig. 3, and eFig. 4).

Discussion

In the study, among the 2453 participants, there were 345 cases of sarcopenia. However, in the simulated Scenarios 1 to 4, after undergoing the process in a community preventive service setting as recommended by the AWGS2019, the number of confirmed sarcopenia cases was 218, 211, 60 and 21, respectively. The confirmed proportion was 63.2%(218/345), 61.2%(211/345), 17.4%(60/345), and 6.09%(21/345), respectively. Additionally, sex differences were observed, with more males being underdiagnosed than females, a finding consistent with other studies [12, 16, 17]. This discrepancy may be attributed to the fact that females tend to perform better on the screening tool in relation to physical performance [18], and men tend to respond in ways that portray their physical ability more favorably, whereas women tend to respond in ways that portray themselves as needing other's care and protection [19].

In the case-finding step, the combined tools (Scenario 1) and CC (Scenario 2) exhibited acceptable AUCs [20–22] of 0.717 and 0.710, respectively. However, SARC-CalF (Scenario 3) and SARC-F (Scenario 4) showed low AUCs of 0.581 and 0.530, primarily due to their extremely low sensitivities of 0.23 and 0.17, respectively. Previous studies have reported low sensitivities for SARC-F and SARC-CalF ranging from 6.4% to 33.3% and 28.2% to 66.7%, respectively, with high specificities ranging from 90.3% to 98.5%, and 84.3% to 92.2%, and low to moderate AUC ranging from 0.540 to 0.775 and 0.706 to 0.816 [12, 14, 23, 24]. Although SARC-F is brief and user-friendly [24], its screening performance remains suboptimal. The addition of CC to SARC-F to form SARC-CalF slightly improves sensitivity but maintains comparable specificity [25, 26]. However, both tools showed AUCs below 0.7 in the study, indicating limited screening ability. While CC may be less reliable in individuals with edema or high body fat [27], it remains the most practical option among the recommended tools [28]. The combined tool slightly improves accuracy but increases operational complexity. Other screening tools, such as the yubi wakka test, SARC-F EBM, SARC-F+AC, SARC-CalF+AC, and Ishii test, show AUCs values of approximately 0.58 [29], 0.82 [24], 0.61–0.80 [23, 30], 0.71–0.85 [23, 30], and 0.82–0.85 [23], respectively, reflecting a trade-off between accuracy and ease of use. More accurate and user-friendly screening tools are needed.

In the assessment step, the performance of the muscle strength test was stable with acceptable AUCs above 0.7, except for Scenario4, which had an AUC of 0.557. This lower value might be influenced by the case-finding step, as only a limited number of participants tested positive in this stage. Compared to the screening tools used in the case-finding step, the muscle strength test showed lower sensitivity, but higher specificity and AUC. HGS reflects early changes in muscle function and correlates well with nutritional status [31]. It has been included as a core indicator for sarcopenia screening by both EWGSOP2 [32] and AWGS 2019 [3], with AUCs ranging from 0.75 to0.90 [33–35]. These values are comparable to those of the 5-time chair stand test, which is recommended by AWGS 2019 for assessing physical performance in the assessment step [36].

When evaluating the case-finding and assessment steps together, the integrated sensitivity of Scenarios 1 to 4 was 0.63,0.61,0.17, and 0.06, respectively, while the integrated specificity was ≥0.92 for all scenarios. The integrated AUC for Scenario 1 to 4 was 0.776,0.768,0.575,and 0.523 respectively. Participants who tested positive in both steps were defined as having possible sarcopenia. According to AWGS 2019, these individuals are recommended to receive lifestyle interventions and are encouraged to undergo confirmatory diagnosis at hospital, Lifestyle interventions, which primarily include exercise and nutritional supplementation [3, 37], are beneficial for most individuals [38] and pose minimal risk to those who are falsely-positive, and the high specificity of the screening process may lead to a slight increase in healthcare costs due to unnecessary hospital referrals. However, false-negative patients, particularly in Scenarios 3 and 4, may face future health problems, including reduced mobility, difficulty managing domestic activities, fatigue, and falls [32, 39]. These issues are primarily due to the low sensitivity of SARC-CalF and SARC-F in the case-finding step.

AWGS 2019 provides separate algorithms for identifying and diagnosing sarcopenia in both hospital and community-based healthcare settings, addressing the limitations of available instruments and the shortage of experienced doctors in community setting, and have been widely adopted for sarcopenia community screening in Asian countries, such as Japan [17], Thailand [40] and South Korea [41]. Given China's ageing society and large population base, promoting the early detection of sarcopenia among community-dwelling older adults is crucial. In the case-finding step, SARC-CalF and SARC-F exhibit extremely low sensitivity and AUC, leading to a high rate of misdiagnosis. Although the combination tool slightly improves accuracy, it complicates the operational process. Therefore, CC is preferred over combination tools, SARC-CalF, and SARC-F. In the assessment step, the muscle strength test improves AUC and specificity, making it suitable for early intervention; however, it also increases the likelihood of false negatives. Additionally, the potential overlap of sarcopenia with obesity, known as sarcopenic obesity, presents a significant challenge in community screening, as traditional tools may not adequately capture this dual burden [42]. For Chinese community-dwelling older adults, future research should focus on developing more accurate and user-friendly tools that consider specific conditions, such as sarcopenic obesity, to implement effective secondary prevention of sarcopenia.

Limitations

In the assessment step, the AWGS 2019 recommends using either a muscle strength test or a physical performance test. In this study, the muscle strength test was employed. However, if the physical performance had also been conducted, the evaluation of the entire process could have been more comprehensive.

Conclusions

In the case-finding step, the CC demonstrated superior performance compared to the combination tool, SARC-CalF and SARC-F. In the assessment step, muscle strength test was performed consistently. The overall accuracy of the case-finding and assessment steps was moderate in Scenarios 1 and 2 but low in Scenarios 3 and 4. These findings highlight the need for more accurate and user-friendly tools to improve the identification of sarcopenia among community-dwelling older adults in China.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12877-025-06042-0.

Supplementary Material 1.

Supplementary Material 2.

Acknowledgements

Not applicable.

Authors' contributions

Huamei Yan analyzed, interpreted the data and drafted the work and substantively revised it. Yongli Chai designed and done investigation.Yujie Zhang, Jiaqi Rong and Ye Zhao done investigation and checked the data. Weian Yuan designed and supervised. All authors read and approved the final manuscript.

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Data availability
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
This study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Research Ethics Committee of Shuguang Hospital Affiliated to Shanghai University of Traditional Chinese Medicine (Approval No.2023-1271-38-01; approval date:2023-03-01). Written informed consent was obtained from all participants.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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