Improving Sarcopenia Diagnosis and Management Through Training in a Cohort of Portuguese Physicians

Aperfeiçoamento do Diagnóstico e Tratamento da Sarcopénia Através da Formação de Médicos em Portugal

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Abstract

Introduction: Although sarcopenia has been formally recognized in the World Health Organization International Classification of Diseases, it is still underdiagnosed and undertreated in clinical practice. This study aimed to assess the current knowledge and management of sarcopenia in a cohort of Portuguese physicians and the effectiveness of a training session on sarcopenia diagnosis and treatment.

Methods: This longitudinal study included Portuguese physicians (n = 31) who completed a questionnaire on knowledge, practice, and barriers regarding sarcopenia screening, diagnosis, and treatment before, immediately after (n = 29), and three months after (n = 27) attending an interactive workshop on sarcopenia.

Results: Before, immediately after, and three months after the workshop, respectively, 66.7%, 96.6%, and 81.5% of physicians knew the definition of sarcopenia. Before the workshop, 33.3% and 44.4% reported performing, respectively, screening and diagnosis in their practice; at three months of follow-up, this number increased to 70.4%. Reported use of SARC-F as a screening tool was increased (22.2% before vs 78.9% after three months). However, the reported use of diagnostic tools to assess muscle strength (i.e., handgrip strength [21.1%] and chair stand test [31.6%]) was low at follow-up. Nutritional intervention focusing on protein intake (87.0%) and resistance exercise (60.9%) were the main treatment strategies reported at three months. Respectively, 68.4% and 82.6% reported barriers to sarcopenia screening/diagnosis and treatment; lack of awareness or knowledge from other healthcare professionals (84.6%) and lack of reimbursement of the cost of oral nutritional supplements (89.5%) were the main barriers experienced.

Conclusion: After the educational event, knowledge on the basic principles of clinical management of sarcopenia improved. Nevertheless, physicians recognize important constraints in sarcopenia diagnosis and treatment in daily clinical practice after three months. Although the workshop effectively raised awareness of sarcopenia, knowledge retention over time remains a challenge.

Keywords: Aged; Geriatric Assessment; Health Care Surveys; Sarcopenia.

Resumo

Introdução: Apesar da sarcopenia ter sido formalmente reconhecida na Classificação Internacional de Doenças da Organização Mundial da Saúde, continua a ser subdiagnosticada e subtratada na prática clínica. Este estudo teve como objetivo avaliar o conhecimento atual e a gestão da sarcopenia numa coorte de médicos portugueses e a eficácia de uma sessão de formação sobre o diagnóstico e tratamento da sarcopenia.

Métodos: Este estudo longitudinal incluiu médicos portugueses (n = 31) que preencheram um questionário sobre conhecimentos, práticas e barreiras relativamente ao rastreio, diagnóstico e tratamento da sarcopenia antes, imediatamente após (n = 29) e três meses após (n = 27) terem participado num *workshop* interativo sobre sarcopenia.

Resultados: Antes, imediatamente após e três meses depois do *workshop*, respetivamente, 66,7%, 96,6% e 81,5% dos médicos conheciam a definição de sarcopenia. Antes do *workshop*, 33,3% e 44,4% referiram efetuar, respetivamente, o rastreio e o diagnóstico na sua prática clínica; três meses após o *workshop*, este número aumentou para 70,4%. A utilização do SARC-F como instrumento de rastreio aumentou (22,2% antes *vs* 78,9% após três meses). No entanto, a utilização reportada de ferramentas de diagnóstico para avaliar a força muscular (ou seja, força de preensão

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https://doi.org/10.24950/rspmi.2708

palmar [21,1%] e o teste de elevação da cadeira [31,6%]) foi reduzida 3 meses após o *workshop*. A intervenção nutricional centrada na ingesta proteíca (87,0%) e o exercício de resistência (60,9%) foram as principais estratégias de tratamento registadas aos três meses. Respetivamente, 68,4% e 82,6% referiram barreiras no rastreio/diagnóstico e tratamento da sarcopenia; a falta de sensibilização ou conhecimento por parte de outros profissionais de saúde (84,6%) e a falta de reembolso do custo dos suplementos nutricionais orais (89,5%) foram as principais barreiras identificadas.

Conclusão: Após a formação, os conhecimentos sobre os princípios básicos da gestão clínica da sarcopenia melhoraram. No entanto, após três meses, os médicos reconhecem importantes constrangimentos no diagnóstico e tratamento da sarcopenia na prática clínica diária. Embora o workshop tenha aumentado efetivamente a sensibilização para a sarcopenia, a retenção de conhecimentos ao longo do tempo continua a ser um desafio.

Palavras-chave: Avaliação Geriátrica; Idoso; Inquéritos sobre Cuidados de Saúde; Sarcopenia.

Introduction

Sarcopenia, originally defined as a loss of muscle mass, has evolved to focus on low muscle strength as a more reliable indicator of muscle function.[1] In 2016, it was officially recognized as an independent disease in the International Classification of Diseases (M62.84), leading to substantial efforts to improve its screening, diagnosis, and management.[2–4] It is most prevalent in older adults and is influenced by factors such as chronic diseases, neurological disorders, physical inactivity, and malnutrition.[1] The balance between protein synthesis and degradation determines muscle mass. After age 40, there is a decline in muscle quality, strength, and function. An increase in anabolic resistance significantly contributes to this decline, necessitating a greater stimulus for protein synthesis to recover and maintain muscle mass. Adequate protein intake, particularly of leucine, along with resistance exercise, can help counteract these age-related effects.[1,5,6]

Sarcopenia is linked to adverse health outcomes, including functional decline, increased risk of falls, cognitive impairment, reduced quality of life, higher healthcare costs, and increased mortality.[7–11] Early screening is crucial since sarcopenia can be asymptomatic in its early stages.[1] Applying recent research findings in clinical practice can help reduce the disease burden and mortality.[3] However, sarcopenia is often underdiagnosed due to the complexity of determining variables and cut-off values for diagnosis. To address this, the European Working Group on Sarcopenia in Older People 2 (EWGSOP2) introduced an updated screening and assessment algorithm in 2019.[1]

The lack of consensus on a single definition of sarcopenia and the variability in diagnostic criteria make establishing its prevalence difficult, depending mainly on the population studied.[12] In Portugal, sarcopenia affects 4% of community-dwelling older adults, with 31% diagnosed with presarcopenia, and 37% of hospitalized older adults.[13,14] Despite its high prevalence, sarcopenia remains underrecognized, even though it is recommended as part of the postgraduate curriculum in geriatric medicine.[15,16]

This study aimed to assess Portuguese physicians' current awareness and clinical practice regarding sarcopenia and their knowledge retention and practice changes following a postgraduate educational event. The ultimate aim was to help minimize these barriers and improve the quality of care for older adults with sarcopenia.

Material and Methods

This longitudinal, observational study aimed to examine how sarcopenia is managed in Portugal by describing current clinical practices and identifying barriers within the health system. To achieve this, we conducted a three-phase survey among physicians, using structured questionnaires administered at three time points: before an educational workshop, immediately after the workshop, and three months later.

STUDY DESIGN

Thirty-one physicians specialized in internal medicine or physical medicine and rehabilitation, participated in this study. All attended an interactive sarcopenia workshop held in November 2022 as part of a geriatrics scientific meeting. There was no pre-selection; all registered volunteers attending the workshop were invited to participate.

Participants were asked to complete three structured questionnaires, which were based on previously validated surveys from other countries, particularly Australia,[19,20] and subsequently adapted to the Portuguese clinical context. The first questionnaire (Q1) assessed participants' awareness and clinical practice related to sarcopenia prior to the workshop. The second (Q2), completed immediately after the workshop, evaluated the impact on sarcopenia awareness and the intention to implement screening, diagnosis, and treatment in practice. The third (Q3), completed three months later, assessed knowledge retention and identified barriers in screening, diagnosis, and treatment. The demographic variables of participant physicians collected in this study included medical specialty, number of years of clinical practice, and work setting (hospital type and estimated percentage of patients aged 65 years or older). The questionnaires are provided in the supplementary material.

All participants were informed about the study's objectives and the confidentiality of their data, both verbally and in writing on the cover page of the initial questionnaire. Respondents were identified only for statistical pairing of their questionnaires, and all data were anonymized after analysis. The results were statistically analyzed and used to

suggest interventions for improving the clinical management of sarcopenia.

SARCOPENIA WORKSHOP

The sarcopenia workshop was a four-hour educational event developed and delivered by the authors, consisting of two evidence-based lectures and two practical sessions, including interactive case report discussions. The EWGSOP2 algorithm was used to guide the screening, diagnosis, and assessment of sarcopenia severity. Participants engaged in practical demonstrations of diagnostic tools such as handgrip strength, the chair stand test, calf circumference, the Timed-Up and Go (TUG) test, and gait speed. Exercise and nutritional interventions for managing sarcopenia were also discussed based on the latest scientific literature and consensus guidelines.[1,3,12,17,18]

STATISTICAL ANALYSES

Statistical analyses consisted of descriptive statistics of the demographic variables of participant physicians using absolute frequencies (n) and relative frequencies (%), which were applied to summarize participant characteristics and survey responses. Data from completed surveys were analyzed using R® version 4.2.2.

ETHICS STATEMENT

This study was exempt from review by an ethics committee, in accordance with institutional guidelines. All participants took part voluntarily after reading the first page of the questionnaire, which clearly explained the study's goals. We protected participants' privacy by keeping all collected information confidential and using it solely for research purposes.

Results

CHARACTERISTICS OF ATTENDING HEALTHCARE PROFESSIONALS

A total of 31 physicians participated in the first survey, 29 in the second, and 27 in the third. Their characteristics are summarized in Table 1. Most participants were specialists in internal medicine (90.3%), 67.7% had five or more years of professional experience, and 83.9% worked in public hospitals. 58.1% of participants reported that more than 80% of their patients are aged 65 years or older.

KNOWLEDGE ABOUT SARCOPENIA DEFINITION, PREVALENCE, AND CLINICAL RELEVANCE

In Q1 (before the workshop), 87.1% of participants were acquainted with the concept of sarcopenia, and 55.6% reported having received formal training in the previous year.

The proportion of participants correctly identifying sarcopenia as “loss of muscle strength and muscle mass” increased from 66.7% in Q1 to 96.6% in Q2 (immediately after the workshop) and then decreased to 81.5% in Q3 (three-month follow-up). The percentage of participants recognizing that sarcopenia affects more than one-third of hospitalized older adults in Portugal increased from 77.8% in Q1 to 96.6% in Q2, with a decrease to 75.9% in Q3. Additionally, 92.6% of participants acknowledged the adverse outcomes of sarcopenia in Q1, with 100% recognizing them in Q2 and 96.3% retaining this knowledge in Q3. Details of this section are summarized in Table S1.

SARCOPENIA SCREENING AND DIAGNOSIS IN CLINICAL PRACTICE

In Q1, 71.0% of participants had attended patients with suspected sarcopenia in the previous month. Still, only 29.6% reported having a protocol for sarcopenia diagnosis or treatment in place or currently under development.

The participants showed awareness of the importance of performing regular sarcopenia screening, with 92.6% in Q1, 96.6% in Q2, and 96.3% in Q3, agreeing that this screening should be done at least annually for patients aged 65 and over (Table S1). Nevertheless, in Q1, only 33.3% and 44.4% of participants reported performing the screening and diagnosis of sarcopenia in their clinical practice, respectively. Although 100% of participants intended to screen and diagnose sarcopenia in Q2, the percentage of patients screened dropped to 70.4% in Q3 (Table 2).

Table 1: Characteristics of attending healthcare professionals.

Medical specialty	
Internal Medicine	28 (90.3%)
Physical Medicine and Rehabilitation	3 (9.7%)
Years of practice	
< 5 years	10 (32.3%)
5-10 years	12 (38.7%)
> 10 years	7 (22.6%)
N/A	2 (6.5%)
Setting	
Public Tertiary referral Hospital	8 (25.8%)
Other Public Hospitals	18 (58.1%)
Private Hospital	2 (6.5%)
Nursing Home	2 (6.5%)
Other (Rehabilitation Centre)	1 (3.2%)

All variables are presented as n (%). Abbreviations: N/A, not available.

Regarding patient types, over 75% of participants in Q1 recognized the importance of sarcopenia screening in older adults and those with malnutrition, neurological diseases, or in rehabilitation. Awareness was lower for those with a history of falls (70.4%), impaired mobility (66.7%), and osteoarthritis (51.9%). After the workshop (Q2), awareness surged,

Table 2: Sarcopenia screening and diagnosis in clinical practice.

	Q1 (Pre-workshop)		Q2 (Post-workshop)	Q3 (Follow-up, 3 months)
	"Do you perform sarcopenia screening in clinical practice?" (n = 27[a])	"Do you perform sarcopenia diagnosis in clinical practice?" (n = 27[a])	"Do you intend to perform sarcopenia screening and diagnosis in clinical practice?" (n = 29)	"Since the workshop, have you performed sarcopenia screening and diagnosis in at least one patient?" (n = 27)
Yes	9 (33.3%)	12 (44.4%)	29 (100.0%)	19 (70.4%)
No	18 (67.7%)	14 (51.9%)	0 (0.0%)	7 (25.9%)
N/A	0 (0.0%)	1 (3.7%)	0 (0.0%)	1 (3.7%)

All variables are presented as n (%). Abbreviations: N/A, not available
[a]Participants (n = 27) who answered "Yes" to the previous question "Are you acquainted with the concept of sarcopenia?".

with 100% agreeing that all older adults should be screened for sarcopenia. This included patients with a history of falls (93.1%), comorbid diseases (89.7%), neurological diseases (86.2%), impaired mobility (86.2%), osteoarthritis (82.8%), and malnutrition (82.8%). However, in Q3, screening was performed in 63.2% of patients with a history of falls and 57.9% of older adults. Screening rates for those in rehabilitation or with other comorbidities were also lower than declared in Q2 (Table S2).

Concerning screening tools, among participants who reported screening for sarcopenia in their clinical practice, identifying signs and symptoms was the predominant strategy, increasing from 77.8% in Q1 to 94.7% in Q3. In Q1, some participants also reported using diagnostic tools such as calf circumference (22.2%) and handgrip strength assessments (33.3%) as part of their screening process. Nutritional assessment tools not formally considered for screening sarcopenia, such as the Mini Nutritional Assessment – Short Form (MNA-SF) and the Malnutrition Universal Screening Tool (MUST), were also mentioned. The workshop increased the use of the SARC-F questionnaire as a screening tool, rising from 22.2% of participants in Q1 to 78.9% in Q3 (Table 3).

For sarcopenia diagnosis, in Q1, a considerable proportion of participants relied on clinical impression (58.3%) and nutritional assessment (50.0%) to diagnose sarcopenia. Few participants applied the EWGSOP2 recommended diagnostic tools, such as the assessment of muscle mass using technological equipment (16.7%), calf circumference measurement (16.7%), assessment of handgrip strength (58.3%), or performing the chair stand test (50.0%), and assessment of gait speed (33.3%). In Q2, a large proportion of participants intended to apply the chair stand test (89.7%), handgrip strength (62.1%), and calf circumference measurement (62.1%) as diagnostic tools; however, after three months (Q3), their use remained low, with only 31.6% using the chair stand test, 21.1% using handgrip strength, and 21.1% using calf circumference measurement (Table 3).

TREATMENT OF PATIENTS WITH SARCOPENIA IN CLINICAL PRACTICE

In Q1, 55.6% of participants recognized that older adults require a higher daily protein intake than younger people. This increased to 96.6% in Q2 and decreased slightly to 85.2% in Q3. The correct daily protein intake was identified by 88.9% of participants in Q1, which rose to 93.1% in Q2 but dropped to 66.7% in Q3. Awareness of leucine as an essential amino acid to increase muscle mass and function improved from 59.3% in Q1 to 100% in Q2 and remained high at 96.3% in Q3 (Table S1). However, only 39.1% of participants included leucine in the treatment plan by Q3 (Table 4). Resistance exercise was recognized as part of the treatment by 81.5% of participants in Q1, rising to 100% in Q2 and slightly decreasing to 96.3% in Q3 (Table S1).

Nutritional intervention focusing on protein intake was considered appropriate by 77.8% of participants in Q1, increasing to 100% in Q2 and slightly decreasing to 87.0% in Q3. Strength or resistance exercise was recognized as a key intervention by 96.3% of participants in Q1, rising to 100% in Q2, but only 60.9% of participants included it in their treatment plans by Q3. Vitamin D supplementation was recommended by 51.9% of participants in Q1, increasing to 96.6% in Q2 and slightly decreasing to 65.2% in Q3 (Table 4).

HEALTHCARE PROFESSIONALS INVOLVED IN SARCOPENIA DIAGNOSIS AND TREATMENT

In Q1, 74.1% of participants reported referring patients with sarcopenia to nutritionists and 40.7% to physiotherapists. Additionally, 88.9% indicated they would refer patients to a multidisciplinary geriatric team in an ideal scenario. In Q2, 72.4% of participants expressed their intention to refer sarcopenia patients to a multidisciplinary geriatric team, but by Q3, only 15.8% reported doing so in clinical practice. Similarly, the intention to refer patients to a geriatrician was high in Q2, with 58.6% of participants planning to do so, but only 10.5% referred patients by Q3. Nutritionists (73.7%)

Table 3: Sarcopenia screening and diagnostic tools used in clinical practice.

Tools used for sarcopenia screening[a]	Q1 (Pre-workshop) "Which of the following tools do you apply during sarcopenia screening?" (n=9[b])	Q2 (Post-workshop) "Which of the following tools do you intend to apply during sarcopenia screening?" (n=29)	Q3 (Follow-up, 3 months) "Which of the following tools did you apply during sarcopenia screening?" (n=19[c])
SARC-F	2 (22.2%)	29 (100.0%)	15 (78.9%)
Clinical impression (signs and symptoms of sarcopenia)	7 (77.8%)	28 (96.6%)	18 (94.7%)
MNA-SF	3 (33.3%)	4 (13.8%)	7 (36.8%)
MNA-FF	0 (0.0%)	1 (3.5%)	1 (5.3%)
MUST	2 (22.2%)	1 (3.5%)	0 (0.0%)
Calf circumference	2 (22.2%)	11 (37.9%)	2 (10.5%)
Handgrip strength	3 (33.3%)	6 (20.7%)	1 (5.3%)
Other	1 (11.1%)	3 (10.3%)	1 (5.3%)
Tools used for sarcopenia diagnosis[a]	**"Which of the following tools do you apply during sarcopenia diagnosis?" (n=12[d])**	**"Which of the following tools do you intend to apply during sarcopenia diagnosis?" (n=29)**	**"Which of the following tools did you apply during sarcopenia screening?" (n=19[b])**
SARC-F	0 (0.0%)	11 (37.9%)	10 (52.6%)
Clinical impression (signs and symptoms of sarcopenia)	7 (58.3%)	12 (41.4%)	13 (68.4%)
Nutritional assessment	6 (50.0%)	6 (20.7%)	6 (31.6%)
Muscle mass (BIA, DXA, CT/MRI echography)	2 (16.7%)	11 (37.9%)	3 (15.8%)
Calf circumference	2 (16.7%)	18 (62.1%)	4 (21.1%)
Handgrip strength	7 (58.3%)	18 (62.1%)	4 (21.1%)
Gait speed	4 (33.3%)	14 (48.3%)	4 (21.1%)
Chair stand test	6 (50.0%)	26 (89.7%)	6 (31.6%)
Other	0 (0.0%)	0 (0.0%)	0 (0.0%)
Recording of sarcopenia diagnosis in clinical file	**"Do you document sarcopenia diagnosis in the patient's clinical record?" (n=12[d])**	**"Do you intend to document sarcopenia diagnosis in the patient's clinical record?" (n=29)**	**"Did you document sarcopenia diagnosis in the patient's clinical record?" (n=19[b])**
Yes	9 (66.7%)	29 (100.0%)	9 (47.4%)
No	0 (0.0%)	0 (0.0%)	0 (0.0%)
Sometimes	3 (33.3%)	0 (0.0%)	10 (52.6%)

All variables are presented as n (%). Correct options are highlighted in gray. Abbreviations: BIA, bioelectrical impedance analysis; CT, computed tomography; DXA, Dual-energy X-ray absorptiometry; MNA-FF, Mini Nutritional Assessment – Full Form; MNA-SF, Mini Nutritional Assessment – Short Form; MRI, magnetic resonance imaging; MUST, Malnutrition Universal Screening Tool.

[a]Participants could select more than one option.
[b]Participants (n = 9) who answered "Yes" to the previous question "Do you perform sarcopenia screening in clinical practice?".
[c]Participants (n =19) who answered "Yes" to the previous question "Since the workshop, have you performed sarcopenia screening and diagnosis in at least one patient?".
[d]Participants (n =12) who answered "Yes" to the previous question "Do you perform sarcopenia diagnosis in clinical practice?".

and physiotherapists (52.6%) were the most frequently consulted healthcare professionals by Q3 (Table S3). Regarding collaboration among healthcare professionals, 59.3% of participants in Q3 classified it as "Reasonable," 22.2% as "Bad," and 18.5% as "Good."

BARRIERS TO SARCOPENIA DIAGNOSIS AND TREATMENT

In Q3, 68.4% of participants reported barriers to sarcopenia screening and diagnosis, while 82.6% identified barriers to treatment. The most frequently reported barriers to

Table 4: Treatment of patients with sarcopenia in clinical practice.

Interventions[a]	Q1 (Pre-workshop)	Q2 (Post-workshop)	Q3 (Follow-up, 3 months)
	"Which of the following interventions do you consider adequate to treat sarcopenia?" (n=27[b])	"Which of the following interventions will you consider when treating sarcopenia?" (n=29)	"Which of the following interventions did you include in sarcopenia treatment plan?" (n=123[c])
Aerobic exercise	10 (37.0%)	14 (48.3%)	8 (34.8%)
Strength/resistance exercise	26 (96.3%)	29 (100.0%)	14 (60.9%)
Balance exercise	14 (51.9%)	12 (41.4%)	7 (30.4%)
Nutritional intervention focusing on protein intake	21 (77.8%)	29 (100.0%)	20 (87.0%)
Nutritional intervention focusing on protein quality (e.g., whey)	16 (59.3%)	28 (96.6%)	10 (43.5%)
Nutritional intervention focusing on leucine/HMB supplementation	14 (51.9%)	28 (96.6%)	9 (39.1%)
Nutritional intervention focusing on arginine supplementation	3 (11.1%)	2 (6.9%)	3 (13.0%)
Nutritional intervention focusing on calcium supplementation	8 (29.6%)	5 (17.2%)	8 (34.8%)
Nutritional intervention focusing on vitamin D supplementation	14 (51.9%)	28 (96.6%)	15 (65.2%)
Other	1 (3.7%)	0 (0.0%)	2 (8.7%)
N/A	1 (0.0%)	0 (0.0%)	4 (17.4%)

All variables are presented as n (%). Correct options are highlighted in gray. Abbreviations: HMB, β-hydroxy β-methylbutyrate; N/A, not available.

[a]Participants could select more than one option.
[b]Participants (n = 27) who answered "Yes" to the previous question "Are you acquainted with the concept of sarcopenia?".
[c]Participants (n = 23) who answered "Yes" to the previous question "Since the workshop, have you been responsible for treating patients with sarcopenia?"

screening and diagnosis were lack of awareness or knowledge among other healthcare professionals (84.6%) and time constraints to perform diagnostic tests (76.9%). For treatment, the main barriers reported were lack of reimbursement for the cost of oral nutritional supplements (ONS) (89.5%), lack of collaboration or availability of other healthcare professionals (73.7%), cost of treatment for the patient (73.7%), and lack of compliance with the treatment plan (73.7%) (Table 5).

Discussion

The results of this study demonstrate that, although medical professionals recognize sarcopenia as an important public health issue, several barriers hinder its effective management in clinical practice. These include inconsistencies in screening, diagnosis, and treatment, as well as challenges related to limited resources, inadequate awareness, and gaps in professional collaboration. While educational interventions initially increased awareness, this tends to decrease over time. The findings underscore the need for continuous professional development and system-level changes to address these barriers and manage sarcopenia effectively in routine care. These barriers could potentially be addressed by the Núcleo de Estudos de Geriatria (NEGERMI), the Geriatrics Study Group of the Portuguese Society of Internal Medicine (SPMI), in collaboration with relevant authorities.

Due to the high prevalence of sarcopenia in older adults, the International Conference on Sarcopenia and Frailty Research (ICSFR) recommends routine screening for individuals aged 65 and older, either annually or following major health events.[3] Although studies show that sarcopenia screening is feasible and should be part of routine care, its implementation still needs to be improved, with standardized strategies still needed.[12] Before the workshop, only 33.3% of participants reported conducting sarcopenia screening, primarily through case-finding based on symptoms. A lack of clinical training in geriatrics and nutrition may contribute to this gap, and tools like the SARC-F questionnaire, recommended by EWGSOP2, can help improve screening.[1] After the workshop, SARC-F use increased significantly, from 22.2% in Q1 to 78.9% in Q3, suggesting better screening and management outcomes for sarcopenic patients.

Table 5: Barriers reported by medical professionals three months after the workshop.

"Which of the following barriers did you experience during sarcopenia screening and diagnosis?" (n = 13[a])	n (%)
Not considering sarcopenia an important disease	0 (0.0%)
Other diseases are a priority	2 (15.4%)
Lack of awareness or knowledge from other healthcare professionals	11 (84.6%)
Lack of collaboration or unavailability of other health professionals	6 (46.2%)
Lack of diagnostic tools	6 (46.2%)
Lack of specific funding for sarcopenia diagnosis	1 (7.7%)
Time constraints	10 (76.9%)
Lack of space to perform diagnostic tests	6 (46.2%)
Lack of human resources	8 (61.5%)
Lack of a specific protocol for sarcopenia	7 (53.8%)
"Which of the following barriers did you experience while treating sarcopenia patients?" (n = 19[b])	**n (%)**
Not considering sarcopenia an important disease	0 (0.0%)
Other diseases are a priority	3 (15.8%)
Lack of awareness from other health professionals	8 (42.1%)
Lack of collaboration or unavailability of other healthcare professionals	14 (73.7%)
Patients/caregivers are not aware of the consequences of sarcopenia	11 (57.9%)
Patients are not compliant to treatment plan	14 (73.7%)
Cost of treatment for the patient	14 (73.7%)
Lack of reimbursement of the cost of nutritional supplements	17 (89.5%)
Lack of specific funding for sarcopenia treatment	7 (36.8%)
Other	0 (0.0%)
Hábitos de consumo (ref: nenhum)	0,629

[a]Participants (n = 13) who answered "Yes" to the previous question "Since the workshop, have you performed sarcopenia screening and diagnosis in at least one patient?" and reported experiencing barriers.

[b]Participants (n = 19) who answered "Yes" to the previous question "Since the workshop, have you been responsible for treating patients with sarcopenia?"

According to the EWGSOP2 algorithm, low muscle strength (assessed by handgrip strength and/or the chair stand test) is the most relevant criterion for diagnosing sarcopenia in clinical practice. If low muscle strength is found, further confirmation of low muscle mass via bioelectrical impedance, imaging, or other techniques is recommended. Physical performance measures like gait speed, the TUG, and SPPB can help assess severity.[1] In our study, the use of specific tools to evaluate muscle strength, mass, and performance after three months was low. Many participants relied on the SARC-F questionnaire and identifying signs and symptoms of sarcopenia for diagnosis, which is intended for screening, reflecting a lack of recognition of the appropriate steps needed to diagnose and assess sarcopenia severity properly.

In addition, many participants used nutritional assessment tools instead of those recommended for sarcopenia screening and diagnosis. Although malnutrition and sarcopenia assessments share similarities, the tools are validated explicitly for each condition. Malnutrition strongly predicts sarcopenia, challenging their distinction in clinical practice.[21,22] Inconsistent reporting of sarcopenia in clinical records further complicates disease recognition and hinders efforts to address barriers like public health policies, research, and reimbursement.

To manage sarcopenia, a comprehensive treatment plan involving resistance/strength training and adequate protein intake is recommended to improve muscle mass and strength.[3,12,23] Resistance training has the highest level of evidence for improving muscle mass, strength, and physical performance in older adults.[24] While strength exercises are fundamental, many physicians also recommend aerobic and balance exercises. Although these exercises are less directly linked to improving muscle strength, they can be integrated into combined training regimens as they benefit older adults and enhance overall physical function.[25]

Nutritional intake in older adults is often inadequate, leading to sarcopenia.[26] A European survey found that insufficient knowledge about protein is common among the older population, but intake increases if recommended by a health professional.[27] The PROT-AGE Study Group recommends 1.0 to 1.2 g/kg body weight (BW) of protein per day for healthy older adults, with 25 to 30 g of leucine per meal to stimulate muscle protein synthesis.[17] The Society on Sarcopenia, Cachexia, and Wasting Disorders suggests 1.0 to 1.5 g/kg BW/day for sarcopenic patients or up to 2 g/kg for severe cases.[12] Despite being the most common nutritional intervention, many participants were unaware of the required protein intake. Leucine, an essential branched-chain amino acid that regulates muscle function and has been linked with improvements in muscle quality and quantity in sarcopenic older adults,[28] was also underrecognized as an approach to treating sarcopenia. These findings highlight the need for better nutritional education.

Vitamin D supplementation is commonly used in the treatment of sarcopenia, as maintaining optimal serum 25-hydroxyvitamin

D [25(OH)D] levels is necessary for muscle function.[29,30] Low vitamin D levels [25(OH)D < 20 ng/ml] are prevalent in Portugal and are linked to a decline in physical performance in older adults.[31,32] Although evidence is insufficient to prove that vitamin D alone effectively treats sarcopenia, it may improve physical activity and muscle function in older patients.[3,12]

Sarcopenia is a major geriatric syndrome caused by a combination of medical, psychological, and social factors. A holistic approach, such as a Comprehensive Geriatric Assessment (CGA), is recommended for managing sarcopenia.[33] A multidisciplinary team, including physicians, nurses, nutritionists and physiotherapists, plays a key role in patient care by improving sarcopenia assessment through regular evaluation of muscle mass, strength, and physical performance.[34,35] However, our study revealed that referral to these teams are limited, likely due to resource constraints and lack of coordinated intervention groups. Although Portugal has a significantly older population, multidisciplinary geriatric teams are scarce, and geriatric medicine is still developing.[36] Participants also reported the low referral rate, reflecting the shortage of specialized professionals. Compared to other European countries, geriatrics is yet to be a recognized specialty in Portugal, and the healthcare system needs coordinated care tailored specifically to older adults.

This study shows that the increased awareness and intention to screen, diagnose, and treat sarcopenia observed immediately after the workshop did not fully translate into real-world practice. The main barrier identified was the lack of reimbursement for oral nutritional supplements (ONS). Considering that protein and specific muscle anabolic nutrient needs are difficult to achieve with a regular diet in patients with sarcopenia (and older patients in general), nutritional supplementation is a fundamental component of the treatment plan.[3,5,6,12] In addition, ONS is a cost-effective intervention with clinical, nutritional, and functional benefits, including improved survival and reduced hospital readmissions.[37–40]

Furthermore, our findings reveal that an interactive educational activity increased sarcopenia screening and diagnosis at three months of follow-up. However, knowledge retention diminished over time, mirroring the decline observed in previous studies from Australia and New Zealand,[19,20] where significant knowledge gains after sarcopenia courses similarly waned several months later.

The key findings of our study, summarized in Table 6, reinforce the need for ongoing education and continuous professional development for medical doctors to enhance engagement, commitment, and consistency in sarcopenia management.

To the best of our knowledge, this is the first study assessing sarcopenia knowledge and clinical practice among Portuguese physicians, identifying key barriers to improving care for sarcopenic patients. A strength of the study is the interactive learning environment, allowing participants to practice skills with expert guidance. Limitations include a small sample size and restriction to physicians specialized in internal medicine and physical medicine and rehabilitation, as the study was conducted within the context of a specific educational workshop with voluntary participation among registered attendees. Additional limitations are the reliance on self-reported questionnaires and the potential for selection bias, as participants were likely highly motivated.

A key limitation is the absence of formal statistical analysis comparing pre- and post-intervention differences. This was due to the descriptive and exploratory design of the study, and variability in the pre- and post-intervention participation, which limited the feasibility of inferential statistical methods. Nonetheless, clear improvement trends were observed descriptively. This exploratory analysis provides valuable initial insights and lays the groundwork for

Table 6: Impact of the workshop and existing barriers in the management of sarcopenia patients in clinical practice.

Positive impact of the workshop	Increased proportion of sarcopenia screening and diagnosis Higher recognition and use of SARC-F as a screening tool Higher recognition of the role of protein intake and leucine supplementation in older patients
Gaps in knowledge and clinical practice	Difficulties in applying the EWGSOP2 algorithm in clinical practice Lack of consistency in the use of screening and diagnostic tools Infrequent registration of sarcopenia diagnosis in clinical records Lack of involvement of multidisciplinary geriatric teams in sarcopenia treatment Insufficient collaboration between health professionals involved in sarcopenia management
Barriers to be addressed to improve sarcopenia diagnosis and treatment	Time constraints to perform diagnostic tests Cost of treatment and lack of reimbursement of the cost of oral nutritional supplements Lack of compliance to treatment plan Lack of awareness/knowledge from health professionals and patients/caregivers on sarcopenia Lack of collaboration or unavailability of other health professionals

future studies incorporating more rigorous inferential statistical approaches. Overall, the study offers important insights into current gaps in sarcopenia management in Portugal and highlights the need for larger, more diverse studies and targeted educational interventions in the future.

Conclusion

There is still room for improvement in training healthcare professionals about sarcopenia, particularly regarding the consistent use of diagnostic tools and treatment protocols. While the educational activity improved knowledge, immediate gains diminished after three months, emphasizing the need for continuous training to apply best practices consistently. Additional barriers to effective sarcopenia management include time constraints, lack of collaboration among healthcare professionals, and insufficient reimbursement for nutritional supplements. Addressing these barriers is essential to enhance patient outcomes and improve the overall management of sarcopenia. ■

Acknowledgments

The authors would like to acknowledge Ana L. Valério and Pablo Rivas, on behalf of Springer Healthcare, for medical writing assistance and W4R for statistical analysis of the data, as well as Dr. Helder Esperto for his contribution to the workshop that gave rise to this article. Danone Nutricia funded this assistance.

Declaration of Generative AI and AI-assisted technologies in the writing process

While preparing this work, the authors used Grammarly to improve readability and language. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.

Contributorship Statement

SD, ASP, JP, MS e PA - All the authors contributed equally to this work.
All authors approved the final version to be published.

Declaração de Contribuição

SD, ASP, JP, MS e PA - Todos os autores contribuíram igualmente para este trabalho.
Todos os autores aprovaram a versão final a ser publicada.

Ethical Disclosures

Conflicts of Interest: SD has received lecture fees and honoraria from Danone Nutricia, Fresenius Kabi, Nestle Health Science, Abbott Nutrition. ASP has received lecture fees and honoraria from Danone Nutricia. JP has received lecture fees and honoraria from Danone Nutricia. MS has received lecture fees and honoraria from Danone Nutricia. PA has received lecture fees and honoraria from Danone Nutricia and Fresenius Kabi.

Financing Support: Danone Nutricia provided funding for this study. The funding body had no role in study design, data collection, data analysis, interpretation, or manuscript writing.

Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of patient data.
Protection of Human and Animal Subjects: The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and those of the Code of Ethics of the World Medical Association (Declaration of Helsinki as revised in 2024).
Provenance and Peer Review: Not commissioned; externally peer-reviewed.

Responsabilidades Éticas

Conflitos de Interesse: SD recebeu honorários por palestras e honorários da Danone Nutricia, Fresenius Kabi, Nestlé Health Science e Abbott Nutrition. ASP recebeu honorários por palestras e honorários da Danone Nutricia. JP recebeu honorários por palestras e honorários da Danone Nutricia. MS recebeu honorários por palestras e honorários da Danone Nutricia. PA recebeu honorários por palestras e honorários da Danone Nutricia e Fresenius Kabi.
Confidencialidade dos Dados: Os autores declaram ter seguido os protocolos da sua instituição acerca da publicação dos dados de doentes.
Proteção de Pessoas e Animais: Os autores declaram que os procedimentos seguidos estavam de acordo com os regulamentos estabelecidos pela Comissão de Ética responsável e de acordo com a Declaração de Helsínquia revista em 2024 e da Associação Médica Mundial.
Proveniência e Revisão por Pares: Não comissionado; revisão externa por pares.

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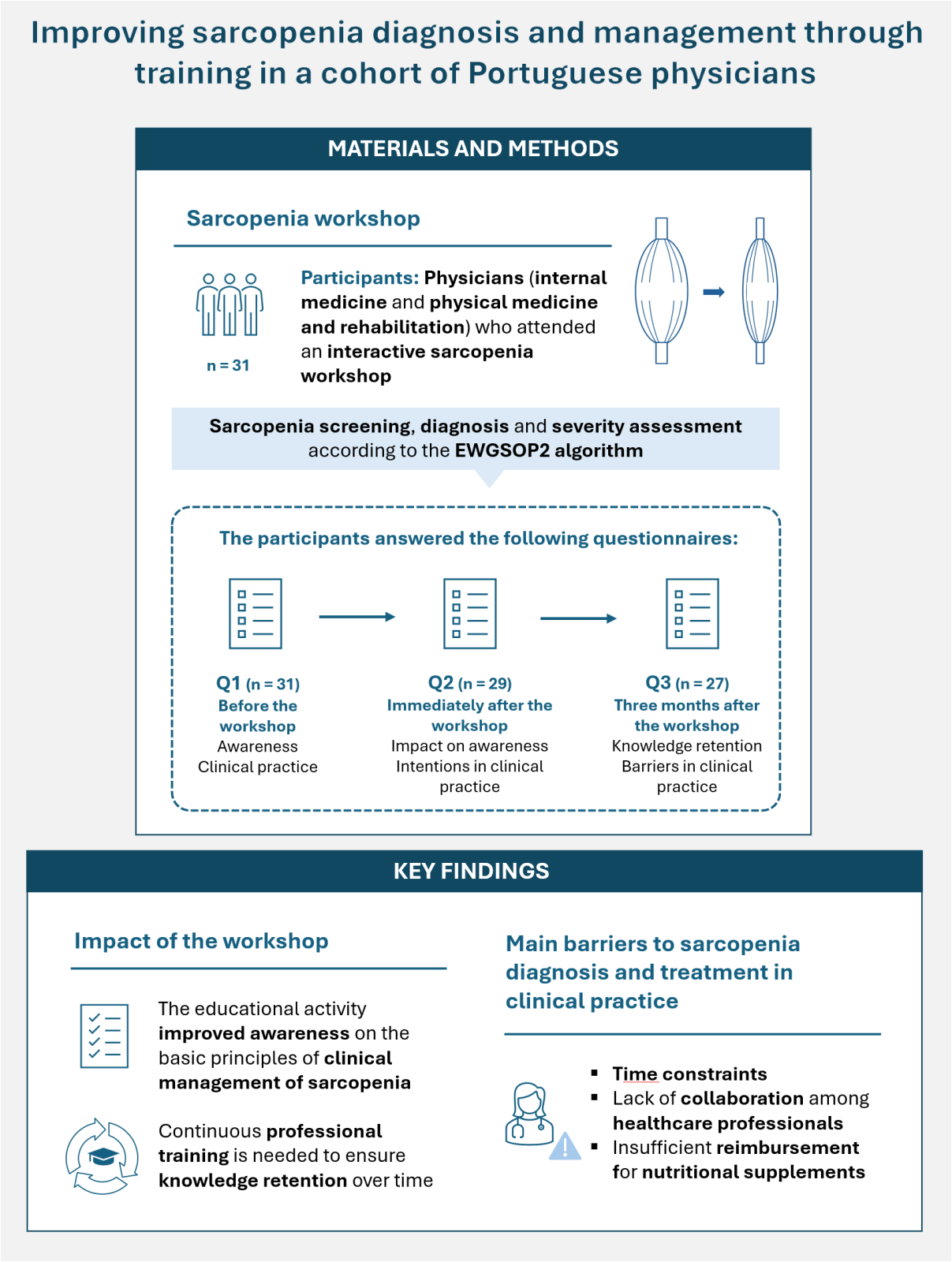
Received / Recebido: 2025/03/21
Accepted / Aceite: 2025/08/01
Published Online / Publicado Online: 2025/12/05
Published / Publicado: 2025/12/05

REFERENCES

1. Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyère O, Cederholm T, et al. Sarcopenia: Revised European consensus on definition and diagnosis. Age Ageing. 2019;48:16–31.
2. ICD-10-CM Diagnosis Code M62.84 - Sarcopenia [Internet]. [cited 2023 Sep 6]. Available from: http://www.icd10data.com/ICD10CM/Codes/M00-M99/M60-M63/M62-/M62.84
3. Dent E, Morley JE, Cruz-Jentoft AJ, Arai H, Kritchevsky SB, Guralnik J, et al. International Clinical Practice Guidelines for Sarcopenia (ICFSR): Screening, Diagnosis and Management. J Nutr Health Aging. 2018;22:1148–61.
4. Cao L, Morley JE. Sarcopenia Is Recognized as an Independent Condition by an International Classification of Disease, Tenth Revision, Clinical Modification (ICD-10-CM) Code. J Am Med Dir Assoc. 2016;17:675–7.

5. Dardevet D, Rémond D, Peyron MA, Papet I, Savary-Auzeloux I, Mosoni L. Muscle wasting and resistance of muscle anabolism: The "anabolic threshold concept" for adapted nutritional strategies during sarcopenia. ScientificWorldJournal. 2012;2012:269531.
6. Dao T, Green AE, Kim YA, Bae SJ, Ha KT, Gariani K, et al. Sarcopenia and muscle aging: A brief overview. Endocrinol Metab. 2020;35:716–32.
7. dos Santos L, Cyrino ES, Antunes M, Santos DA, Sardinha LB. Sarcopenia and physical independence in older adults: the independent and synergic role of muscle mass and muscle function. J Cachexia Sarcopenia Muscle. 2017;8245–50.
8. Chen X, Cao M, Liu M, Liu S, Zhao Z, Chen H. Association between sarcopenia and cognitive impairment in the older people: a meta-analysis. Eur Geriatr Med. 2022;13:771–87.
9. Beaudart C, Demonceau C, Reginster JY, Locquet M, Cesari M, Cruz Jentoft AJ, et al. Sarcopenia and health-related quality of life: A systematic review and meta-analysis. J Cachexia Sarcopenia Muscle. 2023;14:1228–43.
10. Cawthon PM, Lui LY, Taylor BC, McCulloch CE, Cauley JA, Lapidus J, et al. Clinical Definitions of Sarcopenia and Risk of Hospitalization in Community--Dwelling Older Men: The Osteoporotic Fractures in Men Study. J Gerontol A Biol Sci Med Sci. 2017;72:1383–9.
11. Westbury LD, Beaudart C, Bruyère O, Cauley JA, Cawthon P, Cruz-Jentoft AJ, et al. Recent sarcopenia definitions—prevalence, agreement and mortality associations among men: Findings from population-based cohorts. J Cachexia Sarcopenia Muscle. 2023;14:565–75.
12. Bauer J, Morley JE, Schols AMWJ, Ferrucci L, Cruz-Jentoft AJ, Dent E, et al. Sarcopenia: A Time for Action. An SCWD Position Paper. J Cachexia Sarcopenia Muscle. 2019;10:956–61.
13. Sousa-Santos AR, Afonso C, Afonso C, Borges N, Borges N, Santos A, et al. Sarcopenia, physical frailty, undernutrition and obesity cooccurrence among Portuguese community-dwelling older adults: Results from Nutrition up 65 cross-sectional study. BMJ Open. 2020;10:e033661.
14. Sousa AS, Guerra RS, Fonseca I, Pichel F, Amaral TF. Sarcopenia among hospitalized patients - A cross-sectional study. Clin Nutr. 2015;34:1239–44.
15. Bertschi D, Kiss CM, Beerli N, Kressig RW. Sarcopenia in hospitalized geriatric patients: insights into prevalence and associated parameters using new EWGSOP2 guidelines. Eur J Clin Nutr. 2021;75:653–60.
16. Roller-Wirnsberger R, Masud T, Vassallo M, Zöbl M, Reiter R, Van Den Noortgate N, et al. European postgraduate curriculum in geriatric medicine developed using an international modified Delphi technique. Age Ageing. 2019;48:291–9.
17. Bauer J, Biolo G, Cederholm T, Cesari M, Cruz-Jentoft AJ, Morley JE, et al. Evidence-based recommendations for optimal dietary protein intake in older people: A position paper from the PROT-AGE study group. J Am Med Dir Assoc. 2013;14:542–59.
18. Volkert D, Beck AM, Cederholm T, Cruz-Jentoft A, Hooper L, Kiesswetter E, et al. ESPEN practical guideline: Clinical nutrition and hydration in geriatrics. Clin Nutr. 2022;41:958–89.
19. Yeung SSY, Reijnierse EM, Trappenburg MC, Meskers CGM, Maier AB. Current knowledge and practice of Australian and New Zealand health-care professionals in sarcopenia diagnosis and treatment: Time to move forward! Australas J Ageing. 2020;39:e185–93.
20. Reijnierse EM, De Van Der Schueren MAE, Trappenburg MC, Doves M, Meskers CGM, Maier AB. Lack of knowledge and availability of diagnostic equipment could hinder the diagnosis of sarcopenia and its management. PLoS One. 2017;12:e0185837.
21. Meza-Valderrama D, Marco E, Dávalos-Yerovi V, Muns MD, Tejero-Sánchez M, Duarte E, et al. Sarcopenia, malnutrition, and cachexia: Adapting definitions and terminology of nutritional disorders in older people with cancer. Nutrients. 2021;13:761.
22. Gingrich A, Volkert D, Kiesswetter E, Thomanek M, Bach S, Sieber CC, et al. Prevalence and overlap of sarcopenia, frailty, cachexia and malnutrition in older medical inpatients. BMC Geriatr. 2019;19:120.
23. Yoshimura Y, Wakabayashi H, Yamada M, Kim H, Harada A, Arai H. Interventions for Treating Sarcopenia: A Systematic Review and Meta-Analysis of Randomized Controlled Studies. J Am Med Dir Assoc. 2017;18:553.e1-553.e16.
24. Lu L, Mao L, Feng Y, Ainsworth BE, Liu Y, Chen N. Effects of different exercise training modes on muscle strength and physical performance in older people with sarcopenia: a systematic review and meta-analysis. BMC Geriatr. 2021;21:708.
25. Yoo SZ, No MH, Heo JW, Park DH, Kang JH, Kim SH, et al. Role of exercise in age-related sarcopenia. J Exerc Rehabil. 2018;14:551–8.
26. Hengeveld LM, Boer JMA, Gaudreau P, Heymans MW, Jagger C, Mendonça N, et al. Prevalence of protein intake below recommended in community--dwelling older adults: a meta-analysis across cohorts from the PROMISS consortium. J Cachexia Sarcopenia Muscle. 2020;11:1212–22.
27. Visser M, Hung Y, Verbeke W. Protein knowledge of older adults and identification of subgroups with poor knowledge. Nutrients. 2021;13:1006.
28. Lee SY, Lee HJ, Lim JY. Effects of leucine-rich protein supplements in older adults with sarcopenia: A systematic review and meta-analysis of randomized controlled trials. Arch Gerontol Geriatr. 2022;102:104758.
29. Uchitomi R, Oyabu M, Kamei Y. Vitamin d and sarcopenia: Potential of vitamin D supplementation in sarcopenia prevention and treatment. Nutrients. 2020;12:3189.
30. Bollen SE, Bass JJ, Fujita S, Wilkinson D, Hewison M, Atherton PJ. The Vitamin D/Vitamin D receptor (VDR) axis in muscle atrophy and sarcopenia. Cell Signal. 2022;96:110355.
31. Duarte C, Carvalheiro H, Rodrigues AM, Dias SS, Marques A, Santiago T, et al. Prevalence of vitamin D deficiency and its predictors in the Portuguese population: a nationwide population-based study. Arch Osteoporos. 2020;15:36.
32. Wicherts IS, Van Schoor NM, Boeke AJP, Visser M, Deeg DJH, Smit J, et al. Vitamin D status predicts physical performance and its decline in older persons. J Clin Endocrinol Metab. 2007;92:2058–65.
33. Pachołek K, Sobieszczanska M. Sarcopenia identification during comprehensive geriatric assessment. Int J Environ Res Public Health. 2022;19:32.
34. Ellis G, Sevdalis N. Understanding and improving multidisciplinary team working in geriatric medicine. Age Ageing. 2019;48:498–505.
35. Kokura Y, Wakabayashi H, Maeda K, Nishioka S, Nakahara S. Impact of a multidisciplinary rehabilitation nutrition team on evaluating sarcopenia, cachexia and practice of rehabilitation nutrition. J Med Invest. 2017;64:140–5.
36. Soulis G, Kotovskaya Y, Bahat G, Duque S, Gouiaa R, Ekdahl AW, et al. Geriatric care in European countries where geriatric medicine is still emerging. Eur Geriatr Med. 2021;12:205–11.
37. Cawood AL, Elia M, Stratton RJ. Systematic review and meta-analysis of the effects of high protein oral nutritional supplements. Ageing Res Rev. 2012;11:278–96.
38. Neelemaat F, Bosmans JE, Thijs A, Seidell JC, van Bokhorst-de van der Schueren MAE. Oral nutritional support in malnourished elderly decreases functional limitations with no extra costs. Clin Nutr. 2012;31:183–90.
39. Kim CO, Lee KR. Preventive effect of protein-energy supplementation on the functional decline of frail older adults with low socioeconomic status: A community-based randomized controlled study. J Gerontol A Biol Sci Med Sci. 2013;68:309–16.
40. Schuetz P, Sulo S, Walzer S, Vollmer L, Brunton C, Kaegi-Braun N, et al. Cost savings associated with nutritional support in medical inpatients: An economic model based on data from a systematic review of randomised trials. BMJ Open. 2021;11:e046402.

Supplementary Material



EWGSOP2, European Working Group on Sarcopenia in Older People 2.

Table S1: Knowledge about sarcopenia before, immediately after, and three months after the workshop.

	Q1 (Pre-workshop) (n=27[a])	Q2 (Post-workshop) (n=29)	Q3 (Follow-up, 3 months) (n=27)
From your perspective, what is the best definition of sarcopenia?			
Loss of muscle mass and autonomy	0	0	1 (3.7%)
Loss of muscle mass and malnutrition	4 (14.8%)	0	1 (3.7%)
Loss of muscle strength and muscle mass	18 (66.7%)	28 (96.6%)	22 (81.5%)
Loss of muscle strength and frailty	4 (14.8%)	1 (3.4%)	3 (11.1%)
I don't know	0	0	0
N/A	1 (3.7%)	0	0
From your perspective, which of the following options corresponds to the prevalence of sarcopenia in hospitalized patients aged ≥65 in Portugal?			
Less than one fifth of patients	0	0	1 (3.7%)
About a quarter of patients	4 (14.8%)	1 (3.4%)	4 (14.8%)
More than a third of patients	21 (77.8%)	28 (96.6%)	22 (75.9%)
I don't know	1 (3.7%)	0	0
In your opinion, which of the following options could represent potential consequences of sarcopenia?[b]			
Increased risk of falls and fractures	2 (7.4%)	0	0
Inability to perform activities of daily living	2 (7.4%)	0	0
Increased risk of hospitalization	1 (3.7%)	0	0
Increased risk of death	0	0	0
Increased health care costs	0	0	0
All of the above	25 (92.6%)	29 (100.0%)	26 (96.3%)
None of the above	0	0	0
I don't know	0	0	0
N/A	0	0	1 (3.7%)
Do you consider that sarcopenia screening should be performed at least once a year in patients ≥65 years old?			
Yes	25 (92.6%)	28 (96.6%)	26 (96.3%)
No	1 (3.7%)	0	0
I don't know	0	0	0
N/A	1 (3.7%)	1 (3.4%)	1 (3.7%)
Which of the following options do you consider to be the recommended amount of daily protein for individuals ≥65 years old?			
Higher than the recommended daily intake for younger adults	15 (55.6%)	28 (96.6%)	23 (85.2%)
Equal to the recommended daily intake for younger adults	6 (22.2%)	1 (3.4%)	3 (11.1%)
Lower than the recommended daily intake for younger adults	3 (11.1%)	0	0
I don't know	3 (11.1%)	0	0
N/A	0	0	1 (3.7%)
Which of the following options do you consider to be the appropriate daily protein intake for a patient with sarcopenia?			
0.8 g/kg bw/day	0	0	0
1 to 1.5 g/kg bw/day	24 (88.9%)	27 (93.1%)	18 (66.7%)
> 2 g/kg bw/day	1 (3.7%)	2 (6.9%)	6 (22.2%)
I don't know	2 (7.4%)	0	0
N/A	0	0	3 (11.1%)
Do you consider that nutritional supplementation with leucine can contribute to increased muscle mass and function in individuals ≥65 years old?			
Yes	16 (59.3%)	29 (100.0%)	26 (96.3%)
No	0	0	0
I don't know	10 (37.0%)	0	0
N/A	1 (3.7%)	0	1 (3.7%)
Do you consider that prescription of physical exercise with a focus on strength/resistance training should be part of the first-line treatment in patients with sarcopenia?			
Yes	22 (75.9%)	29 (100.0%)	26 (96.3%)
No	3 (11.1%)	0	0
I don't know	2 (7.4%)	0	0
N/A	0	0	1 (3.7%)

All variables are presented as n (%). Correct options are highlighted in gray. Abbreviations: bw, body weight; N/A, not available.

[a]Participants (n = 27) who answered "Yes" to the previous question "Are you familiar with the concept of sarcopenia?".
[b]Participants could select more than one option.

Table S2: Types of patients that should be screened for sarcopenia in clinical practice.

	Q1 (Pre-workshop)	Q2 (Post-workshop)	Q3 (Follow-up, 3 months)
Types of patients[a]	"In which patients do you consider it is important to screen for sarcopenia? (n = 27[b])	"In which patients do you consider it is important to screen for sarcopenia?" (n = 29)	"In which patients did you screen for sarcopenia?"[a] (n = 19[c])
All older adults	25 (92.6%)	29 (100.0%)	11 (57.9%)
Patients in rehabilitation	21 (77.8%)	22 (75.9%)	5 (26.3%)
Patients with comorbidities	20 (74.1%)	26 (89.7%)	8 (42.1%)
Patients with neurologic diseases (e.g., stroke, Parkinson disease)	21 (77.8%)	25 (86.2%)	6 (31.6%)
Patients with impaired mobility	18 (66.7%)	25 (86.2%)	12 (63.2%)
Patients with history of falls	19 (70.4%)	27 (93.1%)	12 (63.2%)
Patients with osteoarthritis	14 (51.9%)	24 (82.8%)	5 (26.3%)
Patients with malnutrition	22 (81.5%)	24 (82.8%)	10 (52.6%)
Other	0	0	1 (5.3%)
N/A	0	0	0

All variables are presented as n (%). Abbreviations: N/A, not available.

[a]Participants could select more than one option.
[b]Participants (n = 27) who answered "Yes" to the previous question "Are you familiar with the concept of sarcopenia?".
[c]Participants (n = 19) who answered "Yes" to the previous question "Since the workshop, have you performed sarcopenia screening and diagnosis in at least one patient?".

Table S3: Health professionals involved in sarcopenia diagnosis and treatment.

	Q1 (Pre-workshop)		Q2 (Post-workshop)	Q3 (Follow-up, 3 months)
Health professionals[a]	"In clinical practice, to which health professionals do you usually refer a patient with sarcopenia?" (n = 27[b])	"In an ideal scenario, which health professionals should be involved in sarcopenia diagnosis and treatment?" (n = 27[b])	"To which health professionals do you intend to refer patients with sarcopenia?" (n = 29)	"To which health professionals did you refer patients with sarcopenia?" (n = 19[c])
None	2 (7.4%)	–	0	0
Internist	4 (14.8%)	19 (70.4%)	15 (51.7%)	3 (15.8%)
Geriatrician	3 (11.1%)	18 (66.7%)	17 (58.6%)	2 (10.5%)
Physiatrist	9 (33.3%)	19 (70.4%)	20 (67.0%)	4 (21.1%)
Nutritionist	20 (74.1%)	21 (77.8%)	27 (93.1%)	14 (73.7%)
Social worker	2 (7.4%)	15 (55.6%)	15 (51.7%)	4 (21.1%)
Physiotherapist	11 (40.7%)	20 (74.1%)	20 (67.0%)	10 (52.6%)
Nurse	0	18 (66.7%)	12 (41.4%)	2 (10.5%)
Multidisciplinary geriatric team	6 (22.2%)	24 (88.9%)	21 (72.4%)	3 (15.8%)
Other	2 (7.4%)	5 (18.5%)	3 (10.3%)	0
N/A	1 (3.7%)	1 (3.7%)	0	0

All variables are presented as n (%). Abbreviations: N/A, not available.

[a]Participants could select more than one option.
[b]Participants (n = 27) who answered "Yes" to the previous question "Are you familiar with the concept of sarcopenia?".
[c]Participants (n = 19) who answered "Yes" to the previous question "Since the workshop, have you performed sarcopenia screening and diagnosis in at least one patient?".

QUESTIONNAIRE 1

1. General

1.1 Please indicate your specialty.

- ☐ Primary Care
- ☐ Internal Medicine
- ☐ Physical Medicine and Rehabilitation
- ☐ Other, please specify:

.....

1.2 Please indicate how many years of clinical practice you have.

.....

1.3 Please indicate your work setting.

- ☐ Primary Care
- ☐ Internal Medicine
- ☐ Physical Medicine and Rehabilitation
- ☐ Other, please specify:
- ☐ Primary Care
- ☐ Internal Medicine
- ☐ Physical Medicine and Rehabilitation
- ☐ Other, please specify:

.....

1.4 Please indicate the estimated percentage of patients you usually assess in your clinical practice who are aged 65 or over.

- ☐ 0% to 20%
- ☐ 21% to 40%
- ☐ 41% to 60%
- ☐ 61% to 80%
- ☐ 81% to 100%

2. Knowledge about sarcopenia

- ☐ Yes
- ☐ No

If you selected "No", please finish the questionnaire.

2.2 Have you attended any training/lectures on sarcopenia in the last year?

- ☐ Yes
- ☐ No

2.3 From your perspective, what is the best definition of sarcopenia?

- ☐ Loss of muscle mass and autonomy
- ☐ Loss of muscle mass and malnutrition
- ☐ Loss of muscle strength and muscle mass
- ☐ Loss of muscle strength and frailty
- ☐ I don't know

2.4 From your perspective, which of the following options corresponds to the prevalence of sarcopenia in hospitalized patients aged 65 and over in Portugal?

- ☐ Less than a fifth of patients
- ☐ Around a quarter of patients
- ☐ More than a third of patients
- ☐ I don't know

2.5 In your opinion, which of the following options could represent potential consequences of sarcopenia? (you can select more than one option)

- ☐ Increased risk of falls and fractures
- ☐ Inability to perform activities of daily living
- ☐ Increased risk of hospitalization
- ☐ Increased risk of death
- ☐ Increased health costs
- ☐ All of the above
- ☐ None of the above
- ☐ I don't know

2.6 Do you consider that sarcopenia screening should be performed at least once a year in patients aged 65 and over?

- ☐ Yes
- ☐ No
- ☐ I don't know

2.7 Which of the following options do you consider to be the recommended amount of daily protein for individuals aged 65 and older?

- ☐ Higher than the recommended daily intake for a young adult
- ☐ Equal to the recommended daily intake for a young adult
- ☐ Lower than the recommended daily intake for a young adult
- ☐ I don't know

2.8 Which of the following options do you consider to be the appropriate daily protein intake for a patient with sarcopenia?

- ☐ 0.8 g/kg BW/day
- ☐ 1 to 1.5 g/kg BW/day
- ☐ > 2 g/kg BW/day
- ☐ I don't know

2.9 Do you consider that nutritional supplementation with leucine can contribute to increase muscle mass and function in individuals aged 65 and higher?

- ☐ Yes
- ☐ No
- ☐ I don't know

2.10 Do you consider that prescription of physical exercise with a focus on strength/resistance training should be part of the first-line treatment in patients with sarcopenia?

- ☐ Yes
- ☐ No
- ☐ Other, please specify:

.....

- ☐ Yes
- ☐ No

3.2 Do you perform sarcopenia screening in clinical practice?

- ☐ Yes
- ☐ No (please proceed to question 3.4)

3.3 Which of the following tools do you apply during sarcopenia screening? (you can select more than one option)

- ☐ SARC-F questionnaire

Identification of symptoms or clinical signs suggestive of sarcopenia (e.g. falls, tiredness, low gait, difficulty getting up from a chair, weight loss or muscle atrophy)

- ☐ Mini Nutritional Assessment - Short Form (MNA-SF)
- ☐ Mini Nutritional Assessment - Full Form (MNA-FF)
- ☐ Malnutrition Universal Screening Tool (MUST)
- ☐ Calf circumference
- ☐ Handgrip strength
- ☐ Other, please specify:

.....

3.4 Do you perform sarcopenia diagnosis in clinical practice?

- ☐ Yes
- ☐ No (please proceed to question 3.6)

3.5 Which of the following tools do you apply during sarcopenia diagnosis? (you can select more than one option)

- ☐ SARC-F questionnaire

Identification of symptoms or clinical signs suggestive of sarcopenia (e.g. falls, tiredness, low gait, difficulty getting up from a chair, weight loss or muscle atrophy)

- ☐ Nutritional assessment
- ☐ Muscle mass determined by BIA, DXA, CT/MRI or echography
- ☐ Calf circumference
- ☐ Handgrip strength
- ☐ Gait speed
- ☐ Chair stand test
- ☐ Other, please specify:

.....

3.6 In which of the following types of patients do you consider it is important to screen for sarcopenia? (you can select more than one option)

- ☐ All older adults
- ☐ Patients undergoing a functional rehabilitation program
- ☐ Patients with comorbidities
- ☐ Patients with neurological diseases (e.g. stroke, Parkinson's disease)
- ☐ Patients with mobility problems
- ☐ Patients with a history of falls
- ☐ Patients with osteoarthritis
- ☐ Patients with malnutrition
- ☐ Other, please specify:

.....

3.7 Do you document sarcopenia diagnosis in the patient's clinical record?

- ☐ Yes
- ☐ No
- ☐ Sometimes

3.8 In your clinical practice, to which health professionals do you usually refer a patient with sarcopenia? (you can select more than one option)

- ☐ None
- ☐ Internist
- ☐ Geriatrician
- ☐ Physiatrist
- ☐ Nutritionist
- ☐ Social worker
- ☐ Physiotherapist
- ☐ Nurse
- ☐ Multidisciplinary Geriatric Team
- ☐ Other, please specify:

.....

3.9 In an ideal scenario, which health professionals do you think should be involved in the diagnosis and treatment of sarcopenia? (you can select more than one option)

- ☐ Internist
- ☐ Geriatrician
- ☐ Physiatrist
- ☐ Nutritionist
- ☐ Social worker
- ☐ Physiotherapist
- ☐ Nurse
- ☐ Multidisciplinary Geriatric Team
- ☐ Other, please specify:

.....

3.10 Which of the following interventions do you consider adequate to treat sarcopenia? (you can select more than one option)

- ☐ Aerobic exercise
- ☐ Strength/resistance exercise
- ☐ Balance exercise
- ☐ Nutritional intervention focusing on increased protein intake
- ☐ Nutritional intervention focusing on protein quality (e.g. whey protein)
- ☐ Nutritional intervention focusing on leucine supplementation or its active metabolite ß-hydroxymethylbutyrate (HMB)
- ☐ Nutritional intervention focusing on arginine supplementation
- ☐ Nutritional intervention focusing on calcium supplementation
- ☐ Nutritional intervention focusing on vitamin D supplementation
- ☐ Other, please specify:

.....

3.11 Does your workplace currently have or is developing a specific protocol for diagnosing and/or treating sarcopenia?

- ☐ Yes
- ☐ No
- ☐ I don't know

QUESTIONNAIRE 2

1. Knowledge about sarcopenia

1.1 From your perspective, what is the best definition of sarcopenia?

- ☐ Loss of muscle mass and autonomy
- ☐ Loss of muscle mass and malnutrition
- ☐ Loss of muscle strength and muscle mass
- ☐ Loss of muscle strength and frailty
- ☐ I don't know

1.2 From your perspective, which of the following options corresponds to the prevalence of sarcopenia in hospitalized patients aged 65 and over in Portugal?

- ☐ Less than a fifth of patients
- ☐ Around a quarter of patients
- ☐ More than a third of patients
- ☐ I don't know

1.3 In your opinion, which of the following options could represent potential consequences of sarcopenia? (you can select more than one option)

- ☐ Increased risk of falls and fractures
- ☐ Inability to perform activities of daily living
- ☐ Increased risk of hospitalization
- ☐ Increased risk of death
- ☐ Increased health costs
- ☐ All of the above
- ☐ None of the above
- ☐ I don't know

1.4 Do you consider that sarcopenia screening should be performed at least once a year in patients aged 65 and over?

- ☐ Yes
- ☐ No
- ☐ I don't know

1.5 Which of the following options do you consider to be the recommended amount of daily protein for individuals aged 65 and older?

- ☐ Higher than the recommended daily intake for a young adult
- ☐ Equal to the recommended daily intake for a young adult
- ☐ Lower than the recommended daily intake for a young adult
- ☐ I don't know

1.6 Which of the following options do you consider to be the appropriate daily protein intake for a patient with sarcopenia?

- ☐ 0.8 g/kg BW/day
- ☐ 1 to 1.5 g/kg BW/day
- ☐ > 2 g/kg BW/day
- ☐ I don't know

1.7 Do you consider that nutritional supplementation with leucine can contribute to increase muscle mass and function in individuals aged 65 and higher?

- ☐ Yes
- ☐ No
- ☐ I don't know

1.8 Do you consider that prescription of physical exercise with a focus on strength/resistance training should be part of the first-line treatment in patients with sarcopenia?

- ☐ Yes
- ☐ No
- ☐ I don't know

2. Clinical practice

2.1 After this workshop, do you intend to screen and diagnose sarcopenia in clinical practice?

- ☐ Yes
- ☐ No (please proceed to question 2.4)

2.2 After this workshop, do you intend to screen and diagnose sarcopenia in clinical practice?

- ☐ SARC-F questionnaire

Identification of symptoms or clinical signs suggestive of sarcopenia (e.g. falls, tiredness, low gait, difficulty getting up from a chair, weight loss or muscle atrophy)

- ☐ Mini Nutritional Assessment - Short Form (MNA-SF)
- ☐ Mini Nutritional Assessment - Full Form (MNA-FF)
- ☐ Malnutrition Universal Screening Tool (MUST)
- ☐ Calf circumference
- ☐ Handgrip strength
- ☐ Other, please specify:

.....

2.3 Which of the following tools do you intend to apply during sarcopenia diagnosis in clinical practice? (you can select more than one option)

- ☐ SARC-F questionnaire

Identification of symptoms or clinical signs suggestive of sarcopenia (e.g. falls, tiredness, low gait, difficulty getting up from a chair, weight loss or muscle atrophy)

- ☐ Nutritional assessment
- ☐ Muscle mass determined by BIA, DXA, CT/MRI or echography
- ☐ Calf circumference
- ☐ Handgrip strength
- ☐ Gait speed
- ☐ Chair stand test
- ☐ Other, please specify:

.....

2.4 Which of the following tools do you intend to apply during sarcopenia diagnosis in clinical practice? (you can select more than one option)

- ☐ All older adults
- ☐ Patients undergoing a functional rehabilitation program
- ☐ Patients with comorbidities
- ☐ Patients with neurological diseases (e.g. stroke, Parkinson's disease)
- ☐ Patients with mobility problems
- ☐ Patients with a history of falls
- ☐ Patients with osteoarthritis
- ☐ Patients with malnutrition
- ☐ Other, please specify:

.....

2.5 Do you intend to document sarcopenia diagnosis in the patient's clinical record?

- ☐ Yes
- ☐ No

2.6 To which health professionals do you intend to refer patients with sarcopenia? (you can select more than one option)

- ☐ None
- ☐ Internist
- ☐ Geriatrician
- ☐ Physiatrist
- ☐ Nutritionist
- ☐ Social worker
- ☐ Physiotherapist
- ☐ Nurse
- ☐ Multidisciplinary Geriatric Team
- ☐ Other(s), please specify:

.....

2.7 Which of the following interventions will you consider when treating sarcopenia? (you can select more than one option)

- ☐ Aerobic exercise
- ☐ Strength/resistance exercise
- ☐ Balance exercise
- ☐ Nutritional intervention focusing on increased protein intake
- ☐ Nutritional intervention focusing on protein quality (e.g. whey protein)
- ☐ Nutritional intervention focusing on leucine supplementation or its active metabolite ß-hydroxymethylbutyrate (HMB)
- ☐ Nutritional intervention focusing on arginine supplementation
- ☐ Nutritional intervention focusing on calcium supplementation
- ☐ Nutritional intervention focusing on vitamin D supplementation
- ☐ Patients with malnutrition
- ☐ Other(s), please specify:

.....

QUESTIONNAIRE 3

1. Knowledge about sarcopenia

1.1 From your perspective, what is the best definition of sarcopenia?

- ☐ Loss of muscle mass and autonomy
- ☐ Loss of muscle mass and malnutrition
- ☐ Loss of muscle strength and muscle mass
- ☐ Loss of muscle strength and frailty
- ☐ I don't know

1.2 From your perspective, which of the following options corresponds to the prevalence of sarcopenia in hospitalized patients aged 65 and over in Portugal?

- ☐ Less than a fifth of patients
- ☐ Around a quarter of patients
- ☐ More than a third of patients
- ☐ I don't know

1.3 In your opinion, which of the following options could represent potential consequences of sarcopenia? (you can select more than one option)

- ☐ Increased risk of falls and fractures
- ☐ Inability to perform activities of daily living
- ☐ Increased risk of hospitalization
- ☐ Increased risk of death
- ☐ Increased health costs
- ☐ All of the above
- ☐ None of the above
- ☐ I don't know

1.4 Do you consider that sarcopenia screening should be performed at least once a year in patients aged 65 and over?

- ☐ Yes
- ☐ No
- ☐ I don't know

1.5 Which of the following options do you consider to be the recommended amount of daily protein for individuals aged 65 and older?

- ☐ Higher than the recommended daily intake for a young adult
- ☐ Equal to the recommended daily intake for a young adult
- ☐ Lower than the recommended daily intake for a young adult
- ☐ I don't know

1.6 Which of the following options do you consider to be the appropriate daily protein intake for a patient with sarcopenia?

- ☐ 0.8 g/kg BW/day
- ☐ 1 to 1.5 g/kg BW/day
- ☐ > 2 g/kg BW/day
- ☐ I don't know

1.7 Do you consider that nutritional supplementation with leucine can contribute to increase muscle mass and function in individuals aged 65 and higher?

- ☐ Yes
- ☐ No
- ☐ I don't know

1.8 Do you consider that prescription of physical exercise with a focus on strength/resistance training should be part of the first-line treatment in patients with sarcopenia?

- ☐ Yes
- ☐ No
- ☐ I don't know

2. Clinical practice - Diagnosis

2.1 Since the workshop, have you performed sarcopenia screening and diagnosis in at least one patient?"

- ☐ Yes
- ☐ No (please proceed to question 3.1)

2.2 What is the estimated percentage of patients with sarcopenia that you have attended in the previous month?

- ☐ 0% to 20%
- ☐ 21% to 40%
- ☐ 41% to 60%
- ☐ 61% to 80%
- ☐ 81% to 100%

2.3 Which of the following tools did you apply during sarcopenia screening? (you can select more than one option)

- ☐ SARC-F questionnaire

Identification of symptoms or clinical signs suggestive of sarcopenia (e.g. falls, tiredness, low gait, difficulty getting up from a chair, weight loss or muscle atrophy)

- ☐ Mini Nutritional Assessment - Short Form (MNA-SF)

- ☐ Mini Nutritional Assessment - Full Form (MNA-FF)
- ☐ Malnutrition Universal Screening Tool (MUST)
- ☐ Calf circumference
- ☐ Handgrip strength
- ☐ Other, please specify:

.....

2.4 Which of the following tools did you apply during sarcopenia diagnosis? (you can select more than one option)

- ☐ SARC-F questionnaire

Identification of symptoms or clinical signs suggestive of sarcopenia (e.g. falls, feeling tired, slow gait, difficulty getting up from a chair, weight loss or muscle atrophy).

- ☐ Nutritional assessment
- ☐ Muscle mass determined by BIA, DXA, CT/MRI or echography
- ☐ Calf circumference
- ☐ Handgrip strength
- ☐ Gait speed
- ☐ Chair stand test
- ☐ Other, please specify:

.....

2.5 In which of the following types of patients did you screen for sarcopenia? (you can select more than one option)

- ☐ All older adults
- ☐ Patients undergoing a functional rehabilitation program
- ☐ Patients with comorbidities
- ☐ Patients with neurological diseases (e.g. stroke, Parkinson's disease)
- ☐ Patients with mobility problems
- ☐ Patients with a history of falls
- ☐ Patients with osteoarthritis
- ☐ Patients with malnutrition
- ☐ Other, please specify:

.....

2.6 Did you document sarcopenia diagnosis in the patient's clinical record?

- ☐ Always
- ☐ Never
- ☐ Sometimes, please specify in which situations:

.....

2.7 To which health professionals do you refer patients with sarcopenia? (you can select more than one option)

- ☐ None
- ☐ Internist
- ☐ Geriatrician
- ☐ Physiatrist
- ☐ Nutritionist
- ☐ Social worker
- ☐ Physiotherapist
- ☐ Nurse
- ☐ Multidisciplinary Geriatric Team
- ☐ Other(s), please specify:

.....

2.8 Did you experience any barriers while performing screening and diagnosis of sarcopenia?

- ☐ Yes
- ☐ No (please proceed to question 3.1)

2.9 In your opinion, which were the main barriers you experienced during sarcopenia screening and diagnosis? (you can select more than one option)

- ☐ I don't consider sarcopenia an important disease
- ☐ There are more important diseases to diagnose and treat
- ☐ Lack of awareness or knowledge from other health professionals
- ☐ Lack of collaboration or unavailability of other health professionals
- ☐ Difficulties in acquiring the tools needed to perform diagnostic tests
- ☐ Lack of space to perform diagnostic tests
- ☐ Time constraints
- ☐ Lack of human resources
- ☐ Lack of specific funding for sarcopenia diagnosis

- ☐ Lack of a specific protocol for sarcopenia
- ☐ Other, please specify:

.....

3. Clinical practice - Treatment

3.1 Since the workshop, have you been responsible for treating patients with sarcopenia?

- ☐ Yes
- ☐ No (please proceed to question 3.5)

3.2 If you answered "yes" to the previous question, which of the following interventions did you include in the treatment plan? (you can select more than one option)

- ☐ Aerobic exercise
- ☐ Strength/resistance exercise
- ☐ Balance exercise
- ☐ Nutritional intervention focusing on increased protein intake
- ☐ Nutritional intervention focusing on protein quality (e.g. whey protein)
- ☐ Nutritional intervention focusing on leucine supplementation or its active metabolite ß-hydroxymethylbutyrate (HMB)
- ☐ Nutritional intervention focusing on arginine supplementation
- ☐ Nutritional intervention focusing on calcium supplementation
- ☐ Nutritional intervention focusing on vitamin D supplementation

.....

3.3 Have you experienced barriers while treating patients with sarcopenia?

- ☐ Yes
- ☐ No (please proceed to question 3.5)

3.4 In your opinion, which were the main barriers you experienced while treating patients with sarcopenia? (you can select more than one option)

- ☐ I don't consider sarcopenia an important disease
- ☐ There are more important diseases to diagnose and treat
- ☐ Lack of awareness or knowledge from other health professionals
- ☐ Lack of collaboration or unavailability of other health professionals
- ☐ Lack of awareness of the consequences of the disease on the part of patients or their caregivers
- ☐ Lack of compliance to the treatment plan by the patient
- ☐ Cost of treatment for the patient
- ☐ Lack of reimbursement of the cost of oral nutritional supplements
- ☐ Lack of specific funding for sarcopenia treatment
- ☐ Other, please specify:

.....

3.5 How would you rate the level of coordination between different health professionals (e.g., physicians, physiotherapist, nutritionist) when monitoring patients with sarcopenia?

- ☐ Good
- ☐ Reasonable
- ☐ Bad