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Narrative Review

Nurses' Key Role in the Early Detection of Sarcopenia among Older People

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ABSTRACT

Sarcopenia, the loss of muscle strength and mass with age, is becoming more frequent among older people and is recognized as a risk factor for falls, disability, and mortality. Sarcopenia can be prevented, delayed, treated, and sometimes even reversed using effective interventions such as early detection. Available screening tools implemented by health professionals can contribute to the early recognition of people at risk for sarcopenia. In this review, we discuss the vital role of nurses, as gatekeepers to care, in the screening process of sarcopenia and the concept of screening as being a part of the professional nursing autonomous roles by presenting the existing evidence regarding the contribution of nurses in the screening interventions for sarcopenia.

KEYWORDS: professional autonomy, review, nursing autonomy, sarcopenia screening

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INTRODUCTION

Achieving healthy aging is a challenge for healthcare providers, as the number and the proportion of people aged 60 years and older are increasing at an unprecedented rate [1]. According to the World Health Organization, the number of older people reached 1 billion in 2019 [1]. This number is expected to increase to 1.4 billion by 2030 and 2.1 billion by 2050 [1]. Life expectancy has continuously improved in all countries for most of the last half-century, although in 2020, COVID-19 negatively impacted it [2]. However, healthy life expectancy does not follow the same trend.

Aging is the reason for many age-related disorders, including neurodegenerative diseases, cardiovascular diseases, cancer, immune system disorders, and musculoskeletal disorders [3]. Sarcopenia is one of the most common aging-related musculoskeletal disorders [3]. In 1989, Irwin Rosenberg first suggested the Greek term “sarcopenia” (meaning “sarx” for flesh and “penia” for loss) to describe the loss of muscle mass or lean body mass among older people [4]. The European Working Group on Sarcopenia in Older People (EWGSOP2) revised its initial definition and defined sarcopenia as a muscle disease, suggesting low muscle strength as a critical characteristic of sarcopenia. Detection of low muscle quantity and quality is used to confirm the sarcopenia diagnosis, and poor physical performance indicates severe sarcopenia [5].

The prevalence of sarcopenia varies across different population settings and ethnicities, according to the definitions, diagnostic methods, and cutoff criteria used [6]. A meta-analysis of general population studies stated that the prevalence of sarcopenia is roughly 10% in males and females, with a higher prevalence among non-Asian populations [7].

Sarcopenia has a complex and multifactorial pathogenesis. Most researchers agree on the following causal factors: neurodegenerative changes resulting in loss of muscle motor units, oxidative stress, inflammation, changes in hormone levels and sensitivity (e.g., insulin resistance), and altered muscle protein metabolism (increased catabolic stimuli and decreased anabolic stimuli) [8,9]. Additionally, behavior/lifestyle factors, such as poor nutritional status and decreased physical activity, are involved in the pathogenesis pathway of sarcopenia [8,9]. Sarcopenia is a risk factor for falls, fractures, disability, dependency, poor quality of life, institutionalization, hospitalization, and mortality among older adults [9]. If those who are likely to suffer from sarcopenia could be identified by screening at an early stage followed by a

comprehensive geriatric assessment, time and labor would be saved, and sarcopenia cases would not remain undiagnosed and untreated [10].

Nurses caring for older people are responsible for delivering person-centered care across various healthcare settings [11]. They can contribute to the early identification of geriatric syndromes and conditions through screening and thorough assessments [12]. Furthermore, “nurses are in a position to refer to and collaborate with, appropriate disciplines, family, and community resources to implement patient-centered interventions” [12]. To the best of our knowledge, this narrative review is the first to summarize the current evidence regarding the role of nurses in the early detection of sarcopenia among older people.

SCREENING TOOLS FOR SARCOPENIA

Identifying potential sarcopenic older adults is the first step in a pathway toward implementing strategies aiming at inhibiting disability and other adverse consequences [13]. In clinical practice, further investigation for sarcopenia is recommended when older individuals present with symptoms indicative of sarcopenia, such as falling, feeling weak, slow walking speed, difficulty rising from a chair, or weight loss/muscle wasting. EWGSOP2 recommends using the SARC-F questionnaire as a screening tool for sarcopenia, but other various screening tools also exist in clinical or research practice [5].

Moreover, the red flag method has been proposed to identify individuals with sarcopenia. During a standard geriatric health assessment, the clinical presentation of individuals with particular manifestations of sarcopenia, such as general weakness, loss of muscle mass, loss of weight, loss of muscle strength, loss of energy, and falls, should be taken into consideration by health professionals. An assessment of nutritional habits using tools such as the Mini-Nutritional Assessment should also be performed to check whether the subject consumes sufficient protein. Finally, health professionals should assess lifestyle habits such as physical inactivity and sedentary behavior. If the screening identifies any red flag suggesting the presence of sarcopenia, diagnostic criteria for sarcopenia can be implemented [14].

Seven validated screening tools are used more frequently in the literature to identify older adults at risk for sarcopenia [15,16]: namely, the two-step algorithm of the EWGSOP1 [17], the SARC-F questionnaire [18], the Mini Sarcopenia Risk

Assessment (MRSA) [19], the screening grid [20], the score chart [21], and the prediction equation [22].

SARCOPENIA SCREENING AS A PART OF PROFESSIONAL AUTONOMY

Achievement of full professional status has always been a matter of concern for nurses, and autonomy is a fundamental principle for accomplishing professional status [23]. Professional nurse autonomy differs from work autonomy, personal autonomy, and aggregate professional autonomy [23]. Professional nurse autonomy is defined as the "belief in the centrality of the client when making responsible discretionary decisions, both independently and interdependently, that reflect advocacy for the client" [23]. Task delegation may lead to increased job satisfaction in general practice, probably through enhancing work autonomy [24]. Nurses' experience, education, and total working hours per week are important factors for promoting nurses' autonomy in general and nurses' work autonomy aiming at the patient's benefit [25]. Nurses, acting autonomously, could contribute to patients' education about medications, self-care activities, health promotion activities, prevention of skin breakdown, and falls [25]. As previously stated, untreated sarcopenia is associated with adverse outcomes such as falls and fractures, having a negative impact on older people's quality of life. Therefore, community health and public health nurses as more autonomous than hospital-employed nurses [26] could ideally identify possible sarcopenia among older adults, especially in the community. Nevertheless, older people's hospitalization due to a health problem allows nurses to act autonomously and observe behaviors and habits indicative of sarcopenia (e.g., feeling weak, slow walking speed). They can implement the available screening tools and then give the proper recommendations to their patients or caregivers.

NURSES AND EARLY SCREENING OF SARCOPENIA

Evidence-based research supports that sarcopenia can be prevented, delayed, treated, and sometimes even reversed through early and effective interventions such as early detection [5]. Nurses taking care of older people in primary healthcare, home care, and hospitals and long-term care facilities come into contact with individuals with possible sarcopenia in their daily practice. They spend a lot of time working next to older adults compared to other health professionals. Nevertheless, their role in

managing sarcopenia and the screening process specifically is not fully documented in the literature.

The participation of home care nurses in the assessment of sarcopenia dates back to 1999, when Travis [27] stated that trained nurses, as members of the interdisciplinary care team, participate in the assessment of sarcopenia by evaluating the nutritional status, implementing physical performance tests, asking for the number and the severity of falls, evaluating the level of mobility, and investigating older people's self-reported wellbeing. Roberts et al. [28] described "how nurses and general practitioners (GPs) can recognize patients at a particular risk of developing the condition," attributing the responsibility for screening to both nurses and GPs. Furthermore, the unique role of primary healthcare nurse practitioners in managing sarcopenia is recognized in the study by Brown and McCarthy [29] since they promote nurses' evidence-based practices, implementing accurate assessment, early detection, and interventions to reduce preventable morbidity and mortality. Additionally, Chang [30] encouraged community nurses to pay attention to the nutritional status of older people, as malnutrition is associated with frailty and sarcopenia. Jackson et al. [31] focused on the beneficial role of nurses through their awareness and interventions, such as screening for sarcopenia and offering appropriate education and treatment. Silva et al. [32] supported the determinant role of primary care nurses in implementing promotional, preventive, and screening procedures for managing sarcopenia. However, their findings showed that nurses' knowledge of sarcopenia screening in the older population was incipient and fragile [32]. Özkaya Sağlam et al. [33] emphasized the importance of nurses' role, as members of a multidisciplinary healthcare team, in preventing and early diagnosing sarcopenia and planning individual interventions.

Other authors highlight the vital role of nurses in defining and recognizing how resistance training can be prescribed for primary prevention and as a practical treatment module in enhancing the health outcomes related to sarcopenia [34]. Findings from another study suggested that skilled nurses help prevent, evaluate sarcopenia, and perform treatment interventions in patients with chronic liver disease [35]. Finally, in a previous review, we discussed identifying sarcopenia characteristics such as weak muscle strength or associated factors such as poor sleep quality in nurse-led care programs for older adults [36].

DISCUSSION

This narrative review summarizes the existing studies that indicate nurses' role in screening sarcopenia. Most studies highlight especially the role of community nurses or home care nurses in screening. However, we believe that hospital-based nurses may also identify older patients at risk for sarcopenia or with its primary signs. Skilled and trained nurses can implement the available screening tools in their everyday practice. Having the advantage of being in constant contact with both community-dwelling older people and inpatients, nurses can guide the screening process in primary care and clinical practice autonomously, within the framework of a multidisciplinary approach, and refer those at risk for sarcopenia to specialists. In this way, the nurses' contribution to the early and effective management of sarcopenia prevents sarcopenic older people from adverse outcomes such as falls, fractures, disability, dependency, poor quality of life, institutionalization, hospitalization, and mortality. Timely intervention can be undertaken to prevent further development of sarcopenia and significantly improve the quality of life of older people [10]. Further research is needed to explore nurses' knowledge of sarcopenia. Moreover, future studies could compare the efficacy of the screening process implemented by nurses in the development of sarcopenia to that implemented by other health professionals.

CONCLUSIONS

Trained nurses who provide care that focuses on the individuals' daily lives can play a valuable role in interventions for sarcopenia, especially in early detection through screening. Their direct and long contact with older people qualifies them to recognize people at risk for sarcopenia autonomously and on time. Nonetheless, this role is not fully recognized in the existing literature. Future research needs to focus on the determinant role of nurses in screening for sarcopenia.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

REFERENCES

[1] Ageing [Internet]. [cited 2022 Feb 23]. Available from: https://www.who.int/westernpacific/health-topics/ageing

[2] OECD. Health at a Glance 2021: OECD Indicators [Internet]. OECD; 2021 [cited 2022 Feb 23]. Available from: https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2021_ae3016b9-en

[3] Li Z, Zhang Z, Ren Y, Wang Y, Fang J, Yue H, Ma S, Guan F. Aging and age-related diseases: from mechanisms to therapeutic strategies. Biogerontology [Internet]. 2021 [cited 2022 Feb 23]; 22: 165–87. Available from: https://doi.org/10.1007/s10522-021-09910-5

[4] Rosenberg IH. Summary comments. Am J Clin Nutr [Internet]. 1989 [cited 2021 May 7]; 50: 1231–3. Available from: https://doi.org/10.1093/ajcn/50.5.1231

[5] Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyère O, Cederholm T, Cooper C, Landi F, Rolland Y, Sayer AA, Schneider SM, Sieber CC, Topinkova E, et al. Sarcopenia: revised European consensus on definition and diagnosis. Age Ageing [Internet]. 2019 [cited 2021 May 7]; 48: 16–31. Available from: https://academic.oup.com/ageing/article/48/1/16/5126243

[6] Tournadre A, Vial G, Capel F, Soubrier M, Boirie Y. Sarcopenia. Joint Bone Spine. 2019; 86: 309–14.

[7] Shafiee G, Keshtkar A, Soltani A, Ahadi Z, Larijani B, Heshmat R. Prevalence of sarcopenia in the world: a systematic review and meta- analysis of general population studies. J Diabetes Metab Disord [Internet]. 2017 [cited 2021 May 27]; 16. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5434551/

[8] Liguori I, Russo G, Aran L, Bulli G, Curcio F, Della-Morte D, Gargiulo G, Testa G, Cacciatore F, Bonaduce D, Abete P. Sarcopenia: assessment of disease burden and strategies to improve outcomes. Clin Interv Aging [Internet]. Dove Press; 2018 [cited 2021 May 25]; 13: 913–27. Available from: https://www.dovepress.com/sarcopenia-assessment-of-disease-burden-and-strategies-to-improve-outc-peer-reviewed-fulltext-article-CIA

[9] Woo J. Sarcopenia. Clin Geriatr Med [Internet]. Elsevier; 2017 [cited 2021 May 25]; 33: 305–14. Available from: https://www.geriatric.theclinics.com/article/S0749-0690(17)30012-5/abstract

[10] Xie W-Q, Xiao G-L, Hu P-W, He Y-Q, Lv S, Xiao W-F. Possible sarcopenia: early screening and intervention-narrative review. Ann Palliat Med [Internet]. AME Publishing Company; 2020 [cited 2022 Feb 23]; 9: 4283293–4293. Available from: https://apm.amegroups.com/article/view/55264

[11] Sillner AY, Madrigal C, Behrens L. Person-Centered Gerontological Nursing: An Overview Across Care Settings. J Gerontol Nurs [Internet]. 2021 [cited 2022 Feb 23]; 47: 7–12. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8080300/

[12] Kim J, Miller S. Geriatric Syndromes: Meeting a Growing Challenge. Nurs Clin North Am. 2017; 52: ix–x.

[13] Marzetti E, Calvani R, Tosato M, Cesari M, Di Bari M, Cherubini A, Collamati A, D'Angelo E, Pahor M, Bernabei R, Landi F, on behalf of the SPRINTT Consortium. Sarcopenia: an overview. Aging Clin Exp Res [Internet]. 2017 [cited 2021 Jun 1]; 29: 11–7. Available from: https://doi.org/10.1007/s40520-016-0704-5

[14] Beaudart C, McCloskey E, Bruyère O, Cesari M, Rolland Y, Rizzoli R, Araujo de Carvalho I, Amuthavalli Thiyagarajan J, Bautmans I, Bertière M-C, Brandi ML, Al-Daghri NM, Burlet N, et al. Sarcopenia in daily practice: assessment and management. BMC Geriatr. 2016; 16: 170.

[15] Locquet M, Beaudart C, Reginster J-Y, Petermans J, Bruyère O. Comparison of the performance of five screening methods for sarcopenia. Clin Epidemiol [Internet]. Dove Press; 2017 [cited 2021 May 30]; 10: 71–82. Available from: https://www.dovepress.com/comparison-of-the-performance-of-five-screening-methods-for-sarcopenia-peer-reviewed-fulltext-article-CLEP

[16] Nawi SNM, Khow KS, Lim WS, Yu SC. Screening Tools for Sarcopenia in Community-Dwellers: A Scoping Review. 2019; 48: 16.

[17] Cruz-Jentoft AJ, Baeyens JP, Bauer JM, Boirie Y, Cederholm T, Landi F, Martin FC, Michel J-P, Rolland Y, Schneider SM, Topinkova E, Vandewoude M, Zamboni M. Sarcopenia:

European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People. Age Ageing [Internet]. 2010 [cited 2021 May 17]; 39: 412–23. Available from: https://academic.oup.com/ageing/article-lookup/doi/10.1093/ageing/afq034
[18]Malmstrom T, Morley J. SARC-F: A Simple Questionnaire to Rapidly Diagnose Sarcopenia. J Am Med Dir Assoc. 2013; 14.
[19]Rossi AP, Micciolo R, Rubele S, Fantin F, Caliari C, Zoico E, Mazzali G, Ferrari E, Volpato S, Zamboni M. Assessing the Risk of Sarcopenia in the Elderly: The Mini Sarcopenia Risk Assessment (MSRA) Questionnaire. J Nutr Health Aging. 2017; 21: 743–9.
[20]Goodman MJ, Ghate SR, Mavros P, Sen S, Marcus RL, Joy E, Brixner DI. Development of a practical screening tool to predict low muscle mass using NHANES 1999–2004. J Cachexia Sarcopenia Muscle [Internet]. 2013 [cited 2021 May 30]; 4: 187–97. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3774922/
[21]Ishii S, Tanaka T, Shibasaki K, Ouchi Y, Kikutani T, Higashiguchi T, Obuchi SP, Ishikawa-Takata K, Hirano H, Kawai H, Tsuji T, Iijima K. Development of a simple screening test for sarcopenia in older adults. Geriatr Gerontol Int [Internet]. 2014 [cited 2021 May 30]; 14: 93–101. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/ggi.12197
[22]Yu S, Appleton S, Chapman I, Adams R, Wittert G, Visvanathan T, Visvanathan R. An Anthropometric Prediction Equation for Appendicular Skeletal Muscle Mass in Combination With a Measure of Muscle Function to Screen for Sarcopenia in Primary and Aged Care. J Am Med Dir Assoc [Internet]. Elsevier; 2015 [cited 2021 May 30]; 16: 25–30. Available from: https://www.jamda.com/article/S1525-8610(14)00398-3/abstract
[23]Wade GH. Professional nurse autonomy: concept analysis and application to nursing education. J Adv Nurs [Internet]. 1999 [cited 2022 Feb 24]; 30: 310–8. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1046/j.1365-2648.1999.01083.x
[24]Riisgaard H, Nexøe J, Le JV, Søndergaard J, Ledderer L. Relations between task delegation and job satisfaction in general practice: a systematic literature review. BMC Fam Pract [Internet]. 2016 [cited 2022 Feb 23]; 17: 168. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5129662/
[25]Mrayyan MT. American nurses' work autonomy on patient care and unit operations. Br J Nurs Mark Allen Publ. 2005; 14: 962–7.
[26]Schutzenhofer KK, Musser DB. Nurse Characteristics and Professional Autonomy. Image J Nurs Sch [Internet]. 1994 [cited 2022 Feb 24]; 26: 201–5. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1547-5069.1994.tb00314.x
[27]Travis S, All AC, Bernard M. Remediating the effects of sarcopenia in the elderly client's plan of care. Home Healthc Nurse. 1999; 17: 166–74; quiz 174–5.
[28]Roberts H, Lowry A, Sayer A. Assessment and management of older people with sarcopenia. Nurs Older People. 2014; 26: 18, 20–2.
[29]Brown WJ, McCarthy MS. Sarcopenia: What Every NP Needs to Know. J Nurse Pract [Internet]. Elsevier; 2015 [cited 2022 Feb 24]; 11: 753–60. Available from: https://www.npjournal.org/article/S1555-4155(15)00659-5/fulltext
[30]Chang S-F. Frailty Is a Major Related Factor for at Risk of Malnutrition in Community-Dwelling Older Adults. J Nurs Scholarsh Off Publ Sigma Theta Tau Int Honor Soc Nurs. 2017; 49: 63–72.
[31]Jackson KL, Hunt D, Chapa D, Gropper SS. Sarcopenia-A baby boomers dilemma for nurse practitioners to discover, diagnose, and treat. J Nurs Educ Pract [Internet]. 2018 [cited 2022 Mar 3]; 8: 77. Available from: https://www.sciedu.ca/journal/index.php/jnep/article/view/12756
[32]Silva RF, Figueiredo M do LF, Darder JJT, Santos AMR dos, Tyrrell MAR. Sarcopenia screening in elderly in primary health care: nurse knowledge and practices. Rev Bras Enferm [Internet]. Associação Brasileira de Enfermagem; 2020 [cited 2022 Feb 24]; 73. Available from: http://www.scielo.br/j/reben/a/HLtwtWRTwNy8FzTHPngtp3t/?lang=en
[33]Özkaya Sağlam B, Küçükgüçlü Ö. Yaşlılarda Sarkopeni ve Hemşirelik. Dokuz Eylül Üniversitesi Hemşire Fakültesi Elektron Derg [İnternet]. 2021 [cited 2022 Feb 23]; : 461–70. Available from: https://dergipark.org.tr/tr/doi/10.46483/deuhfed.925813
[34]Hunt D, Chapa D, Hess B, Swanick K, Hovanec A. The importance of resistance training in the treatment of sarcopenia. J Nurs Educ Pract [Internet]. 2014 [cited 2022 Feb 24]; 5: 39. Available from: https://www.sciedu.ca/journal/index.php/jnep/article/view/5805

[35]Ohashi K, Ito M, Kawakubo M, Sato I. Evaluation of and Intervention for Sarcopenia in Hepatology Departments: A Survey of Nurses in Japan. Healthcare [Internet]. 2021 [cited 2022 Feb 23]; 9: 1021. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8392142/
[36]Pana A, Sourtzi P, Kalokairinou A, Pastroudis A, Chatzopoulos S-T, Velonaki VS. Association between muscle strength and sleep quality and duration among middle-aged and older adults: a systematic review. Eur Geriatr Med [Internet]. 2021 [cited 2021 Jun 4]; 12: 27–44. Available from: https://doi.org/10.1007/s41999-020-00399-8