

Relationship of Anxiety, Physical Performance, and Sarcopenia in Older People with Low Back Pain: A Scoping Review

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Abstract

Low back pain (LBP) is highly prevalent among older adults due to age-related sarcopenia, declining physical function, and anxiety, leading to disability and reduced independence. However, a limited understanding of their interaction hinders effective screening and rehabilitation. This review aims to explore the relationship between anxiety, physical performance, and sarcopenia in older adults with LBP. A comprehensive search of PubMed, Scopus, Google Scholar, and Web of Science was conducted in strict accordance with PRISMA-ScR review guidelines. Nine studies reported reduced physical performance, and Sarcopenia increased LBP, disability, and anxiety. Thus, dual physical-psychological screening may optimize LBP management in older adults.

Keywords: Low back pain; Anxiety; Sarcopenia; Physical Performance

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1.0 Introduction

Low back pain (LBP) is a prevalent and debilitating condition in older adults, commonly resulting in functional decline and reduced quality of life, and many factors contribute to the disability and high costs of LBP in older adults (Ammendolia, 2025). The one-year prevalence ranges of sarcopenia were 8 %-12% in men and 8%-13% in women, among community-dwelling seniors, with up to 40% experiencing impairment in daily functioning (Hao et al., 2018). Sarcopenia, defined as the age-related loss of muscle mass and function, is both a contributor to and a consequence of chronic pain (Tanishima, Hagino, Matsumoto, Tanimura, & Nagashima, 2017). A meta-analysis covering over 33,000 older adults found sarcopenia odds were significantly higher in those with chronic pain (OR = 1.52), with a stronger association in low- and middle-income countries (OR = 1.73) (Chen et al., 2023). Since sarcopenia impairs strength and mobility, its coexistence with LBP intensifies functional impairment.

Psychological factors, particularly anxiety and depression, intensify pain perception and hinder rehabilitation adherence in older adults with LBP (Sahin & Şentürk, 2023), while physical performance, such as gait speed, grip strength, and functional tests, often reflects both sarcopenia and LBP-related disability and predicts future decline (Tsekoura, Billis, Matzaroglou, Tsepis, & Gliatis, 2024). Chronic LBP is therefore a multidimensional condition, driven by the interaction of musculoskeletal, psychological, and performance-based factors, with inactivity further accelerating muscle loss and vulnerability to pain (Iwahashi et al., 2022).

Furthermore, anxiety and distress modulate pain perception through central sensitization and demotivate efforts toward activity or rehabilitation, perpetuating deconditioning (Shalaby, el-sharaki, & Salem, 2018). However, few studies have concurrently examined

sarcopenia, anxiety, and physical performance in relation to LBP, particularly in primary care and Southeast Asian settings, highlighting a critical evidence gap. Therefore, this study aims to review existing evidence on the relationship between anxiety, physical performance, and sarcopenia among older adults with LBP.

2.0 Methodology

This scoping review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for scoping reviews, as outlined in the PRISMA Extension for Scoping Reviews (PRISMA-ScR), which is presented in Figure 1. The review process was guided by the methodological framework developed by Arksey and O'Malley for conducting scoping reviews. This framework outlines six steps; however, this review employed the following five key steps, which include (1) identifying the research questions; (2) identifying the relevant studies; (3) studying the selections; (4) charting the data; and (5) collecting, summarizing, and reporting the results.

a) Identification of the Research Question: The review began by clearly defining the research question, focusing on mapping the empirical evidence concerning the relationship between anxiety, physical performance, and sarcopenia in older adults with low back pain (LBP). We identify the primary research question for this scoping review, which was "What is the relationship between anxiety levels, physical performance, and sarcopenia among older adults with low back pain (LBP)?", "What gaps exist in the evidence? "What is the extent, range, and nature of evidence regarding the relationship between anxiety, physical performance, and sarcopenia in older adults with low back pain (LBP). Older adults with LBP often exhibit reduced mobility, altered gait, and decreased functional capacity. Anxiety, common in individuals experiencing chronic pain, may further impair physical performance by increasing muscle tension, decreasing motivation, and altering pain perception.

b) Identification of Relevant Studies: A comprehensive literature search was conducted in the PubMed, Scopus, Web of Science (WOS), and Google Scholar databases, targeting studies published up to June 2025. The search strategy was designed to capture relevant studies that met the inclusion criteria. The Boolean terms "AND", "OR", and "AND NOT" were used to separate the keywords. Articles that met the inclusion criteria were catalogued in EndNote, detailing the authors, journal, year, title, and population. A final systematic search, conducted across all databases using the following search terms: ("Anxiety" OR "Physical Performance" OR "Sarcopenia" OR "Anxiety" "Anxiety" OR "Physical Performance" OR "Sarcopenia" OR "Low Back Pain: OR "anxiety" OR "Sarcopenia") AND (Anxiety OR "Low Back Pain" OR "Physical Performance" OR "Sarcopenia" OR "Older people") AND ("Older people" OR OT OR "Low back pain" OR Physical Performance).

c) Selection of Eligible Studies: The studies identified during the search were screened based on predetermined inclusion criteria: articles written in English, involving human participants aged 60 years and above, diagnosed with LBP, and with measures focusing on the specific dimensions of anxiety, physical performance, and sarcopenia.

d) Charting the Data: Data was extracted from the selected studies, organized into themes and subthemes corresponding to the dimensions under investigation. Anxiety, physical performance, and sarcopenia are interrelated factors influencing older adults with low back pain. Mapping these themes clarifies evidence patterns and highlights their combined impact on functional decline and overall well-being. The extraction process involved summarizing key findings and mapping them against the research question. A standardized data extraction form was developed to ensure consistency across all studies. This form included fields for study characteristics (authors, year of publication, study design, setting, and population), as well as specific variables related to the research question (e.g., measures of anxiety, physical performance, sarcopenia, and outcomes related to LBP). The extracted data were initially categorized according to the primary dimensions of interest.

e) Data Collation, Summarization, and Reporting of the Results: The extracted data were collated, summarized, and synthesized into a narrative report. The results were organized to highlight the relationships between the identified dimensions and their impact on LBP among older adults, providing a comprehensive overview of the current evidence.

3.0 Results

The results of the final systematic search are presented in Figure 1. The selection process of the studies followed a systematic approach. Initially, 1,292 records were identified from four databases: Google Scholar (n=430), PubMed (n=285), Scopus (n=246), and Web of Science (n=331). After removing 310 duplicate records, 982 studies were screened based on their titles and abstracts. From these, 901 records were excluded for various reasons; the Title and abstract did not meet the criteria. Subsequently, 81 full-text reports were assessed for eligibility. Among these, 72 were excluded due to the absence of the full text (n=36), the sample was not healthy (n=15), experimental/Intervention studies (n=10), or a mixed population (n=11). Ultimately, nine studies met all the inclusion criteria and were included in the review. This rigorous selection process ensured the relevance and quality of the studies analyzed. Summaries of each article are presented in Table 1.

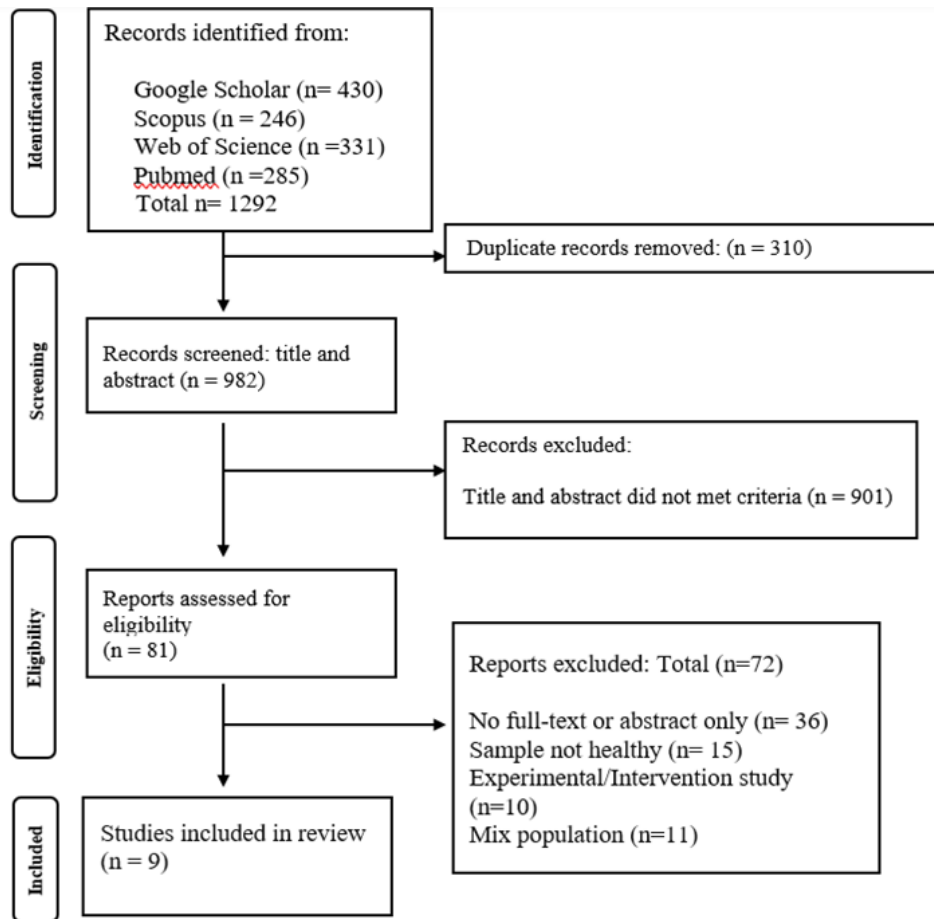


Fig. 1: PRISMA-ScR flowchart of the study

Table 1. Summary of the articles

Author(s)/ Year	Study Design	Country	Sample Populations	Outcome Measure	Summary of findings
Sakai et al. (2017)	Cross-sectional	Japan	660(≥60 yrs)	DXA, VAS, Rolland Moris Questionnaire, Digital muscle strength meter	Lean mass and trunk strength are reduced in older adults with LBP.
Sun, Lee, Yim, Won, and Ko (2019)	Cross-sectional	Korea	4937(≥60 yrs)	Sarcopenia index, EQ-5D	-Sarcopenia impacts the quality of life of older people. -Anxiety in women with sarcopenia increases - Reduced quality of life in men with sarcopenia
Wada, Tanishima, Osaki, Nagashima, and Hagino (2019)	Cross-sectional	Japan	72(≥60 yrs)	Pain Catastrophizing Scale, SARC-F, BIA, Hospital Anxiety & Depression scale, Fear Avoidance Beliefs Questionnaire	-Sarcopenia linked to catastrophizing in back pain patients. -13.9% sarcopenia had an increase in HADS-anxiety score and PCS score
Tsuji et al. (2021)	Cross-sectional	Japan	730 (≥65 yrs)	AWGS 2019, ODI, Frailty	LBP is associated with frailty (OR = 3.41), but not with sarcopenia. suggests that not only the decline in physical function but also neuropsychiatric factors
Imai et al. (2022)	Cross-sectional	Japan	149(≥65 yrs)	Pain Catastrophizing Scale, Central Sensitization, Sarcopenia AWGS, EQ5D-QL, TSK-11	Central sensitization is more frequent in sarcopenia and LBP patients, 13.3%

Sahin and Şentürk (2023)	Cross-sectional	Turkey	210 (mean age 72.4)	SARC-F, MMSE, Geriatric Pain Scale	Chronic pain was present in 92.9%; pain score predicted sarcopenia. Sarcopenia with LBP-77 in older people
Queiroz et al. (2023)	Cross-sectional	Brazil	98(≥60 yrs)	Primary Care Assessment Tool instrument (PCATool-Brazil), SARC-F, Short Physical Performance Battery scale	Sarcopenia is related to greater healthcare use and poor mobility. LBP(n=52)
Tsekoura et al. (2024)	Cross-sectional	Greece	314 (mean age 71.3)	EWGSOP2, HADS, Pain Score,BIA, Falls Efficacy Scale-International (FES-I)	Sarcopenia prevalence was 32.78% of sarcopenic had chronic lumbar pain with HADS-anxiety scale higher
Xing et al. (2025)	Cross-sectional	China	8113	AWGSOP Sarcopenia criteria, LBP prevalence	Sarcopenia increased LBP risk 24.19%; without sarcopenia 16.4% depression and poor sleep also linked.

3.1 Extent, Range, and Nature of Evidence

This scoping review synthesized evidence from nine studies examining the relationship between anxiety, physical performance, and sarcopenia in older people with low back pain. The findings reveal a growing body of evidence supporting the interconnected roles of sarcopenia, reduced physical performance, and anxiety in contributing to low back pain (LBP) among older adults. While each factor independently impacts functional capacity and quality of life, their combined presence appears to heighten the severity of the LBP and associated disability. The findings underscore the multifactorial nature of LBP in ageing populations, involving both physical and psychological domains.

3.2 Gaps in Evidence

Reduced gait speed, grip strength, and muscle mass were consistently linked to greater pain and mobility limitations, while anxiety was shown to worsen pain perception and reduce participation in physical activity. Although the number of studies exploring anxiety was more limited, available evidence suggests that mental health plays a critical role in the experience and management of LBP. Evidence suggests that reduced physical performance, such as low gait speed, grip strength, and presence of sarcopenia, is consistently associated with higher levels of LBP-related disability. Although fewer in number, studies addressing anxiety indicate that it plays a significant role in exacerbating pain perception and limiting physical function.

3.3 Implications for Research and Practice

This scoping review synthesized evidence from nine studies, highlighting several important implications for both future research and clinical practice in the management of low back pain (LBP) among older adults. In terms of clinical practice, the review emphasizes the importance of adopting a holistic, multidisciplinary approach in the assessment and management of LBP in older adults. Primary healthcare providers should be encouraged to integrate routine screening for sarcopenia and physical performance deficits using simple, feasible tools such as the SARC-F questionnaire or grip strength testing. At the same time, psychological assessment, particularly for anxiety and depression, should be considered a standard component of musculoskeletal care for older adults with chronic LBP.

Furthermore, interventions targeting both physical and psychological domains, such as exercise programs combined with cognitive-behavioral therapy (CBT) or pain education, may be more effective in reducing disability and improving quality of life than physical therapy alone. This integrated approach is particularly relevant in community and primary care settings, where early detection and prevention strategies can significantly reduce long-term functional decline and healthcare burden.

4.0 Discussion

4.1 Physiotherapy's Unique Contribution to Anxiety, Physical Performance, and Sarcopenia in Older People with LBP

Physiotherapy plays a vital role in managing low back pain (LBP) among older adults, particularly where physical decline, sarcopenia, and anxiety coexist. Unlike singular treatment approaches, physiotherapy offers an integrated model that addresses both the physical and psychological components of chronic pain. Targeted exercise interventions, including resistance training, balance exercises, and trunk stabilization, have been shown to improve gait speed, muscle strength, and postural control. These improvements are crucial in reversing or slowing sarcopenia, enhancing mobility, and reducing fall risk. Physiotherapists are also skilled in functional assessments and early identification of performance deficits using tools like the Timed Up and Go (TUG) and grip strength tests. In addition, physiotherapy contributes to mental health management.

Regular physical activity is associated with reduced anxiety and improved emotional well-being. Techniques such as pain education, cognitive reassurance, and graded exposure help reduce fear-avoidant behaviors and pain catastrophizing, especially relevant in older adults with anxiety. Within primary care, physiotherapists are well-placed to deliver early, low-cost, non-pharmacological interventions. Their role in promoting self-management and independence aligns closely with healthy ageing principles. Furthermore, physiotherapists are well-placed within primary care teams to conduct early screening for risk factors related to both musculoskeletal and psychological health using simple, validated tools. This enables early referral, prevention of functional decline, and promotion of self-management.

strategies that align with healthy ageing goals. Overall, physiotherapy offers a multidimensional, non-pharmacological approach that is both cost-effective and adaptable to various healthcare settings. Its ability to simultaneously target muscle strength, physical function, and mental health makes it a vital component in the comprehensive management of LBP in older adults with sarcopenia and anxiety. Thus, physiotherapy serves as a critical component in comprehensive care for older adults with LBP, sarcopenia, and anxiety.

4.2 Barriers and Opportunities

A major barrier identified is the lack of studies examining the combined effects of sarcopenia, anxiety, and physical performance on low back pain (LBP) in older adults. Most research treats these factors separately and relies on cross-sectional designs, limiting causal understanding. However, there are opportunities for progress, particularly through multidisciplinary care in primary health settings. Simple screening tools like SARC-F, TUG, and anxiety scales make early detection feasible, even in low-resource areas. The growing burden of LBP and sarcopenia also highlights the need for community-based prevention programs that support physical and mental health in older adults.

4.3 Future Directions

Another future direction is the development and testing of integrated care models in primary healthcare that combine physical rehabilitation with psychological support. Studies should investigate the effectiveness of multidisciplinary interventions, such as exercise programs, cognitive-behavioral therapy (CBT), pain education, and nutritional support, in reducing disability and improving quality of life among older adults with LBP. In addition, digital health tools and telehealth interventions offer promising avenues for delivering accessible, cost-effective care to older populations, especially in rural or underserved areas. Future research should assess the feasibility and outcomes of technology-assisted screening and intervention strategies in managing LBP alongside sarcopenia and anxiety in ageing communities.

5.0 Conclusion

Within primary care, physiotherapists are well-placed to deliver early, low-cost, non-pharmacological interventions. Their role in promoting self-management and independence aligns closely with the principles of healthy ageing. Thus, physiotherapy serves as a critical component in comprehensive care for older adults with LBP, sarcopenia, and anxiety. By integrating physical and psychological care, physiotherapy supports healthy ageing and helps reduce the burden of LBP in older adults. Its holistic, functional, and person-centered approach makes it an essential component in the multidisciplinary management of LBP.

6.0 Paper Contribution to Related Field of Study

This paper synthesizes the understanding of low back pain in older adults by highlighting the combined influence of sarcopenia, reduced physical performance, and anxiety. It shows that these factors are interrelated and may worsen pain and disability. The findings support the need for integrated assessment and management strategies in primary care that address both physical and psychological aspects of LBP in the ageing population. The review informs both clinical practice and future research by mapping current evidence and proposing directions for methodological improvement.

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References

- Ammendolia, C. (2025). Ten myths of back pain in older adults that can lead to ineffective and harmful care. *Chiropr Man Therap*, 33(1), 45. doi:10.1186/s12998-025-00609-9
- Chen, H., Huang, X., Dong, M., Wen, S., Zhou, L., & Yuan, X. (2023). The Association Between Sarcopenia and Diabetes: From Pathophysiology Mechanism to Therapeutic Strategy. *Diabetes Metab Syndr Obes*, 16, 1541-1554.
- Hao, Q., Hu, X., Xie, L., Chen, J., Jiaojiao, J., Dong, B., & Yang, M. (2018). Prevalence of sarcopenia and associated factors in hospitalised older patients: A cross-sectional study. *Australasian Journal on Ageing*, 37.
- Imai, R., Imaoka, M., Nakao, H., Hida, M., Tazaki, F., Inoue, T., . . . Nakamura, M. (2022). Association between chronic pain with presarcopenia and central sensitization in Japanese community-dwelling older adults: A cross-sectional study. *Medicine (Baltimore)*, 101(32), e29998. doi:10.1097/md.0000000000002998

- Iwahashi, Hashida, R., Matsuse, H., Higashi, E., Bekki, M., Iwanaga, S., . . . Shiba, N. (2022). The impact of sarcopenia on low back pain and quality of life in patients with osteoporosis. *BMC Musculoskeletal Disord*, 23(1), 142.
- Queiroz, A. M., Estrázulas, J. A., Gamelo, L., Siqueira, J. H., Fonseca, F. R., & Herkrath, F. J. (2023). Association of physical performance and sarcopenia with use of health services in elderly people living in rural riverside areas in the Amazon: a cross-sectional study. *Rural Remote Health*, 23(4), 7957. doi:10.22605/rrh7957
- Sahin, U. K., & Şentürk, A. Y. (2023). The Relationship between Chronic Musculoskeletal Pain and Sarcopenia Risk in Community-Dwelling Older Adults: A Cross-Sectional Study. *Ann Geriatr Med Res*, 27(3), 250-257. doi:10.4235/agmr.23.0081
- Sakai, Y., Matsui, H., Ito, S., Hida, T., Ito, K., Koshimizu, H., & Harada, A. (2017). Sarcopenia in elderly patients with chronic low back pain. *Osteoporos Sarcopenia*, 3(4), 195-200. doi:10.1016/j.afos.2017.09.001
- Shalaby, A. S., el-sharaki, D. R., & Salem, G. M. (2018). Anxiety, depression, and quality of life in backache patients before and after spinal traction. *The Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, 54(1), 44.
- Sun, S., Lee, H., Yim, H. W., Won, H. S., & Ko, Y. H. (2019). The impact of sarcopenia on health-related quality of life in elderly people: Korean National Health and Nutrition Examination Survey. *Korean J Intern Med*, 34(4), 877-884. doi:10.3904/kjim.2017.182
- Tanishima, S., Hagino, H., Matsumoto, H., Tanimura, C., & Nagashima, H. (2017). Association between sarcopenia and low back pain in local residents prospective cohort study from the GAINA study. *BMC Musculoskeletal Disorders*, 18(1), 452. doi:10.1186/s12891-017-1807-7
- Tsekoura, M., Billis, E., Matzaroglou, C., Tsepis, E., & Gliatis, J. (2024). Association between Chronic Pain and Sarcopenia in Greek Community-Dwelling Older Adults: A Cross-Sectional Study. *Healthcare (Basel)*, 12(13). doi:10.3390/healthcare12131303
- Tsuji, S., Shinmura, K., Nagai, K., Wada, Y., Kusunoki, H., Tamaki, K., . . . Tachibana, T. (2021). Low back pain is closely associated with frailty but not with sarcopenia: Cross-sectional study of rural Japanese community-dwelling older adults. *Geriatr Gerontol Int*, 21(1), 54-59. doi:10.1111/ggi.14100
- Wada, T., Tanishima, S., Osaki, M., Nagashima, H., & Hagino, H. (2019). Relationship between sarcopenia and pain catastrophizing in patients with lumbar spinal stenosis: A cross-sectional study. *Osteoporos Sarcopenia*, 5(4), 132-136. doi:10.1016/j.afos.2019.12.001
- Xing, W.-Y., Tang, L., Zheng, Y.-N., Bai, Y.-W., Jiang, X., Bi, X., & Wang, X.-Q. (2025). Prevalence and risk factors of lower back pain in middle-aged and elderly people with sarcopenia: a nationwide cross-sectional study. *BMC Public Health*, 25(1), 1517. doi:10.1186/s12889-025-22723-2