

The Profile of Low Back Pain and Sarcopenia in The Elderly at UPTD Griya Wreda Jambangan

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ABSTRACT

Background: Low Back Pain (LBP) is a symptom characterized by pain in the lower back that may radiate to the right or left leg. LBP frequently occurs in individuals who engage in prolonged standing or sitting activities or lift heavy objects with improper posture. Studies suggest that LBP has a negative correlation with Serious Mental Illness and a positive correlation with pelvic tilt, indicating that sarcopenia may be associated with LBP due to posterior pelvic tilt. **Objective:** This study aims to analyze the relationship profile between low back pain and sarcopenia. **Method:** This is an observational study with a cross-sectional design conducted within a specific population over a defined period. The study subjects were selected using a random sampling method, comprising individuals aged ≥ 60 years at the UPTD Griya Wreda Jambangan who met the study criteria. Interviews were conducted using questionnaires for elderly individuals experiencing low back pain. **Result:** The statistical test results on the significance and strength of the relationship between variables using the Spearman Correlation Coefficient (with a significance level of $p < 0.05$) yielded a value of < 0.01 . This indicates that the research hypothesis is proven, demonstrating a relationship between low back pain and sarcopenia.

Keywords: elderly; low back pain; sarcopenia.

INTRODUCTION

Low Back Pain (LBP) is a symptom characterized by pain in the lower back area that can radiate to the right or left leg [1]. Among workers, this complaint generally begins in early adulthood, peaking in prevalence among those aged 45–60. LBP often occurs in individuals who engage in prolonged standing or sitting activities or lift heavy objects with improper posture [1]. Approximately 60–80% of the global population has experienced at least one episode of low back pain (lifetime prevalence), regardless of age or gender. The pain can range from severe and long-lasting to moderate and brief, improving within a few weeks for most people [2]. The annual prevalence of LBP worldwide varies significantly, reaching rates of 15–45%. According to WHO [3], 33% of the population in developing countries experience persistent pain [4].

This condition often coexists with other psychological, social, and biophysical factors, affecting pain transmission and individual pain perception [5]. The biophysical conditions associated with aging can lead to sarcopenia, a common and progressive skeletal muscle disorder that has been shown to correlate with various diseases; however, the relationship between sarcopenia and pain has yet to be systematically clarified [6]. Studies indicate that the incidence of sarcopenia in Indonesia ranges from 9.1% to 59%. With 9.92% (26.82 million) of Indonesia's population being elderly, this figure is projected to approach one-fifth of the total population by 2045 [7]. Research from January 2009 to December 2016 reviewed 35 articles involving a total sample of 58,404 healthy elderly individuals, both Asian and non-Asian, showing a prevalence of sarcopenia ranging from 0.35% to 36.6%,

with an average of 10% (95% CI 8–12%) in both men and women [8]. This wide range is attributed to differences in diagnostic criteria, population age, ethnicity, social and cultural backgrounds, dietary patterns, and lifestyle. According to another study, the sarcopenia ratio is 32% [9]. The intensity of low back pain, measured by the Visual Analogue Scale (VAS), was significantly higher in the sarcopenia group than in the non-sarcopenia group in this study [10]. Sarcopenia was identified as a significant factor for LBP in JOABPEQ using Cox multivariate regression analysis, with a sarcopenia ratio of 40.0% in the LBP group and 26.6% in the non-LBP group, indicating an association between sarcopenia and LBP [10]. Additionally, spinal alignment, including pelvic tilt, is a contributing factor to LBP [11]. Schwab [12] found that pelvic tilt significantly correlates with the Oswestry Disability Index Score, which indicates back pain. Another study reported that LBP has a negative correlation with Serious Mental Illness and a positive correlation with pelvic tilt, suggesting that sarcopenia may be associated with LBP due to posterior pelvic tilt. In this study, pelvic tilt was significantly higher in the sarcopenia group than in the non-sarcopenia group and was also significantly correlated with the intensity of LBP, as measured by VAS. Sarcopenia may be associated with posterior pelvic tilt and low back pain.

METHOD

This study is an observational study with an analytical cross-sectional design to examine the relationship between sarcopenia and low back pain at an elderly care facility. Sampling was conducted using stratified random sampling from subjects aged ≥60 years at the elderly care facility who met the inclusion criteria and did not meet the exclusion criteria. The data in this study are primary data from questionnaires and cross-sectional surveys collected by the researchers from a population aged ≥60 years with low back pain at the Jambangan Elderly Care Facility during the period of October 2023. The study's independent variable is Low Back Pain, and the dependent variable is Sarcopenia. The distribution of data was found to be non-normal; therefore, data were analyzed using the Spearman Coefficient Correlation to conduct a statistical correlation test. The correlation test yielded a value of 0.000, which is <0.05, indicating a significant relationship or correlation between low back pain and sarcopenia. The Spearman correlation coefficient showed a positive result, meaning that Low Back Pain and sarcopenia are directly proportional; as the score of low back pain increases, the risk of sarcopenia also increases, and as the score of low back pain decreases, the risk of sarcopenia decreases as well.

RESULT AND DISCUSSION

The basic characteristics of the patients are shown in Table 1. Among the 61 respondents, 36.0% were male and 46.0% were female. The majority of respondents were middle-aged elderly (70–79 years) at 49.2%, followed by young elderly (60–69 years) at 31.2%, and advanced elderly (>80 years) at

19.6%. There were 26.3% of study subjects with comorbidities such as obesity, diabetes mellitus, bone structure abnormalities, and herniated nucleus pulposus (HNP).

TABLE 1: Tulis Nama.

Characteristic	Number (%)
Gender	
Male	36,0%
Female	46,0%
Age	
Young elderly (60-69 years)	31,2%
Middle-aged elderly (70-79 years)	49,2%
Advanced elderly (> 80 years)	19,6%.
Comorbidities	
Obesity	3,3%
Diabetes Melitus	5,0%
Bone Structure Abnormalities	16,3%
HNP	1,7%

In this study, the level of low back pain was measured using the "Modified Oswestry Low Back Pain Disability Questionnaire," and the results showed that 30 study subjects experienced low back pain with a minimal to moderate disability type, totaling 45 elderly individuals. This aligns with a 2021 study [13] that examined the relationship between low back pain and quality of life among elderly individuals in the village of Cimandala, which found that low back pain can result from musculoskeletal system changes that occur with aging. These musculoskeletal changes affect the posture of the elderly, making it more flexed and increasing the load on the back. Complaints of low back pain frequently arise in connection with certain jobs or activities. This can lead to physical capacity impairments, such as pain, muscle weakness, and limited movement, causing functional difficulties like trouble rising from sitting to standing, walking, and prolonged sitting in the elderly.

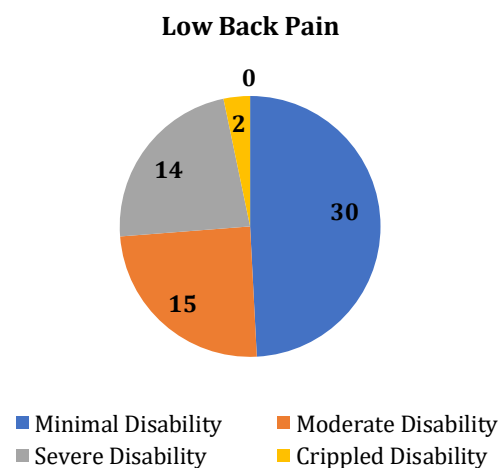


FIGURE 1: Low Back Pain.

In this study, sarcopenia was measured using the SARC-F questionnaire at the Jambangan Elderly Care Facility, with results shown in Table 5.2. Among the 61 study subjects, 37 were found to have sarcopenia and were female, with most scoring >4. The SARC-F questionnaire assesses factors such as muscle strength, assistance with walking, ability to rise from a chair, ability to climb stairs, and risk of falls. This aligns with a study on osteoporosis and sarcopenia prevention in the elderly [14], which indicated that older adults may have lost a significant portion of muscle mass (30%) and strength (50%), predisposing them to sarcopenia. Women between the ages of 70 and 74 reported a higher prevalence of sarcopenia than men. This gender disparity may be due to men having higher peak muscle mass and strength during young adulthood compared to women. It is important to note that accepted definitions also use different cut-off points for sarcopenia components, such as muscle mass, strength, and/or physical performance, with some studies using population averages/medians and other cut-off points that predict future outcomes [14].

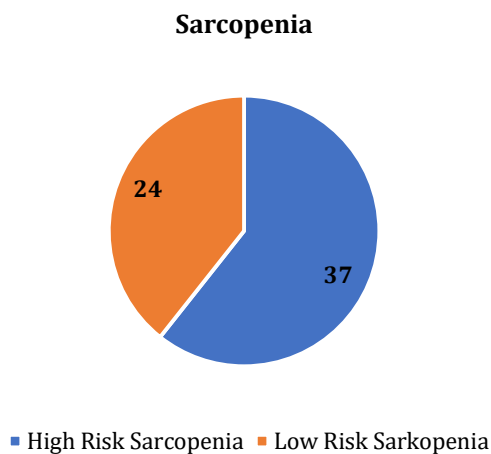


FIGURE 2: Sarcopeni.

The results of the study on the profile of low back pain with sarcopenia at the Jambangan Elderly Care Facility in October 2023 showed that the majority of study subjects suffered from low back pain with moderate disability and that 15 subjects had sarcopenia. In study which discussed the impact of sarcopenia on back pain in osteoporosis patients [9], it was concluded that sarcopenia is related to low back pain. Additionally, spinal alignment, including pelvic tilt, is one of the causes of low back pain [10]. Eguchi [12] reported that low back pain has a negative correlation with Serious Mental Illness (SMI) and a positive correlation with pelvic tilt, suggesting that sarcopenia may be associated with low back pain due to posterior pelvic tilt. In Shinji's study [15] investigated the relationship between sarcopenia and low back pain in elderly individuals, defining sarcopenia as the age-related loss of muscle mass and function. Musculoskeletal disorders are significantly affected by sarcopenia. The prevalence of sarcopenia is over 50% among people over 80 years old in Mexico, and individuals with sarcopenia experience physical disabilities.

Although current studies show that the prevalence of low back pain is not significantly different among the three groups, the Oswestry Disability Index (ODI) scores were significantly higher in the sarcopenia group than in other groups. The higher prevalence of sarcopenia may be associated with several modifiable risk factors. However, findings from this review may not be conclusive due to inconsistencies in sarcopenia diagnostic guidelines for older adults with low back pain [16].

The results of this study show similar findings; age is a factor that affects the degree of low back pain with sarcopenia, where older age corresponds with higher pain levels and thus higher sarcopenia scores. Low back pain alone cannot be used as the main indicator of sarcopenia, as many other variables that influence sarcopenia have not yet been studied. Further research is needed to identify the risk factors of sarcopenia in older adults with low back pain.

CONCLUSION

The subjects of this study were 61 elderly individuals at the Jambangan Elderly Care Facility and the Elderly Community in Surabaya. Among them, 6 elderly individuals (10.1%) had sarcopenia, and 24 elderly individuals (38.8%) did not have sarcopenia, with moderate disability-type low back pain. Fourteen elderly individuals (23.2%) had severe disability-type low back pain with sarcopenia, 2 elderly individuals (3.2%) had crippled disability-type low back pain with sarcopenia, and 0 elderly individuals were neither included in the sarcopenia nor non-sarcopenia categories (0%). As age increases, the severity of low back pain also increases, leading to a higher sarcopenia score. This indicates that low back pain is related to the severity of sarcopenia.

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