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Association Between Sarcopenia and Quality of Life in Community-Dwelling Older Adults: Findings From a Cross-Sectional Study

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Abstract:
Sarcopenia is common in older adults and contributes to functional decline, disability, and increased healthcare utilization. In community-dwelling older adults, increased risk of sarcopenia may limit daily activities and negatively affect health-related quality of life, yet evidence from community settings in Indonesia remains limited. This study examined the association between risk of sarcopenia and health-related quality of life among community-dwelling older adults. Cross-sectional study conducted in the working area of Wanasari Public Health Center, Bekasi Regency, Indonesia, February–March 2025. Community-dwelling adults aged ≥60 years (n=305) were recruited by consecutive sampling. Risk of sarcopenia was measured using the SARC-CalF (SARC-F plus calf circumference) questionnaire; health-related quality of life was measured with the EQ-5D-5L (EuroQol-5 Dimension, 5-level). Validity and reliability testing of instruments in the study sample are reported in Methods. The association between sarcopenia risk (continuous SARC-CalF score) and EQ-5D index score was assessed with Spearman's rank correlation. The result showed that Mean age 64.65±5.20 years; 61.3% female. A total of 137/305 (44.9%) were classified as at risk of sarcopenia (SARC-CalF), and 168/305 (55.1%) as low risk. Median (range) SARC-CalF = 4 (0–20). Median EQ-5D index = 0.83 (0.41–1.00). There was a strong, negative correlation between SARC-CalF score and EQ-5D index (Spearman's rho = –0.711, p<0.001), indicating higher sarcopenia risk relates to lower quality of life. In this community sample, higher risk of sarcopenia is strongly associated with poorer health-related quality of life. We recommend routine screening for sarcopenia risk in primary care and further analytic studies to identify independent predictors in this population.

Keywords: *Sarcopenia; Quality of Life; Aged; Community-Dwelling; Screening*
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INTRODUCTION

The global population is undergoing a rapid demographic transition, marked by a substantial increase in the number and proportion of older adults. In 2015, individuals aged 60 years and over accounted for 12.3% of the world's population, and this proportion is projected to increase to 14.9% by 2025 and 16.4% by 2030 (World Health Organization, 2024, 2025). Indonesia mirrors this global trend. National data indicate that the proportion of older adults has continued to rise and is projected to reach

approximately 11.1% by 2025, with the absolute number of older adults estimated at around 33.7 million people (Dugarova, 2017; Kemenkes, 2023). This rapid population ageing process poses a serious challenge in the field of public health, particularly in maintaining the functional independence and quality of life of the elderly.

The phenomenon of population ageing is also evident at the regional level. In West Java Province, approximately 10.17% of the population are elderly, and Bekasi Regency is one of the areas with a relatively high number of elderly people (Badan Pusat Statistik Provinsi Jawa Barat, 2024). The increase in the proportion of elderly people has implications for a rise in the dependency ratio, which ultimately adds to the burden on families, communities and the health care system. The elderly tend to be more prone to chronic diseases and functional limitations, thereby reducing their ability to live independently and increasing their need for health services and social support. Thus, understanding the health conditions that have the potential to interfere with the functioning and quality of life of the elderly is crucial in planning public health services and primary care (Che et al., 2025; Wang et al., 2025).

Sarcopenia is one of the main factors contributing to the decline in function associated with the ageing process. This condition is a geriatric syndrome characterised by a gradual and comprehensive decline in skeletal muscle mass and strength. Muscle mass loss generally begins in early adulthood and accelerates with age, leading to limited mobility, balance disorders, and an increased risk of falls and injuries (Chen et al., 2020; Marzetti et al., 2017). Sarcopenia is closely associated with limitations in daily activities, reduced independence, and increased use of healthcare services. In community-dwelling older adults, this condition can hinder routine activities and reduce social participation (Wang et al., 2025; West et al., 2025).

Studies in Indonesia shows considerable variation in the prevalence and risk of sarcopenia in older adults, ranging from around 9% to more than 50%, depending on the characteristics of the respondents and the assessment methods used (Putra et al., 2020; Vitriana et al., 2016; Widajanti et al., 2020). These differences reflect variations in diagnostic criteria, measurement instruments, and research contexts. In community-based and primary care settings, comprehensive diagnostic tests such as dual-energy X-ray absorptiometry are often difficult to implement. Therefore, the availability of simple, practical, and reliable screening tools is crucial for identifying older adults at risk of sarcopenia, enabling optimal early detection and prevention efforts at the community level.

The quality of life of older adults is a multidimensional concept that encompasses physical health, psychological well-being, independence, social relationships, and interaction with the surrounding environment (Jazayeri et al., 2023; West et al., 2025). Sarcopenia has the potential to reduce these dimensions through decreased muscle strength, impaired mobility, fatigue, and limitations in performing daily activities, which ultimately reduce autonomy and social engagement. A population-based cross-sectional study by West et al. (2025) found that sarcopenia was significantly associated with a decline in quality of life across multiple domains, particularly physical and psychological aspects, even after accounting for sociodemographic factors and health conditions. This indicates that the impact of sarcopenia is not only physical but also extends to aspects of daily functioning and mental health. Furthermore, pathway analysis research on elderly people with cancer shows that sarcopenia affects quality of life both directly and through the mediators of nutritional status and physical function, indicating a complex relationship between muscle loss and reduced well-being (Wang et al., 2025). These findings emphasise the importance of early detection of sarcopenia risk, given that its impact on quality of life involves various functional and nutritional mechanisms.

Although international evidence on the relationship between sarcopenia and quality of life is growing, research specifically examining this relationship in community-dwelling older adults in Indonesia remains relatively limited.. Moreover, few studies have focused on sarcopenia risk using feasible screening instruments suitable for community settings. The SARC-CalF instrument is recommended as a practical screening tool because it combines functional assessment with calf circumference measurement, is easy to administer, and has demonstrated good sensitivity for identifying older adults at risk of sarcopenia. Addressing this knowledge gap, the present study aims to examine the association

between the risk of sarcopenia, assessed using SARC-CalF, and health-related quality of life, measured by EQ-5D-5L, among community-dwelling older adults in Bekasi Regency, Indonesia.

METHODS

Study Design and Setting

This study used a cross-sectional design and was conducted in the working area of the Wanasari Community Health Centre, Bekasi Regency, West Java Province, Indonesia. Data collection was carried out from February to March 2025 in the community covered by the health centre. This article follows STROBE guidelines for Cross sectional report.

Participants and Sampling

The study population consisted of elderly people living in the community, aged 60 years and above, and residing in the working area of the Wanasari Community Health Centre. Participants were deemed to meet the inclusion criteria if they were able to communicate well and were willing to participate in the study by providing written informed consent. Exclusion criteria included acute illness at the time of data collection, significant communication disorders, or a documented diagnosis of dementia.

Participant recruitment was conducted using consecutive sampling during community health activities. From this process, 305 respondents with complete data were included in the final analysis. Detailed information regarding the recruitment process, including the number of individuals invited, those who refused to participate, and incomplete questionnaires, is presented in the supplementary material.

Sample Size

The minimum sample size calculation was performed using G*Power software version 3.1 to ensure adequate statistical power in detecting the relationship between sarcopenia risk and health-related quality of life. Referring to previous studies examining the relationship between sarcopenia and quality of life, a moderate effect size with a correlation coefficient of $r = 0.30$ was assumed. The analysis was performed using a two-tailed test, with a significance level (α) of 0.05 and a test power ($1-\beta$) of 0.80. Based on these parameters, the minimum sample size required to detect a statistically significant relationship was 85 participants. In this study, the number of samples collected reached 305 elderly people living in the community, far exceeding the minimum requirement.

Variables and Measurements

Risk of sarcopenia

The risk of sarcopenia was assessed using the SARC-CalF questionnaire, an instrument that combines the SARC-F questionnaire with calf circumference measurements. The SARC-F component was used to assess several aspects of physical function, including muscle strength, need for assistance when walking, ability to get up from a sitting position, ability to climb stairs, and history of falls. Meanwhile, calf circumference measurement served as an an. Scoring procedures and cut-off values used to classify participants as at risk or not at risk of sarcopenia are presented in the corresponding table and described briefly in this section.

Health-related quality of life

Health-related quality of life was measured using the EQ-5D-5L instrument, which assesses five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), each with five levels of severity. Responses were converted into a single index score using the appropriate country-specific value set. In the absence of an Indonesian value set, a widely used regional tariff was applied, with justification provided. Higher index scores indicate better perceived health-related quality of life.

Validity and reliability

Internal consistency reliability of the study instruments was evaluated within the study sample. The SARC-CalF demonstrated good reliability, with a Cronbach's alpha of 0.851, while the EQ-5D-5L showed acceptable reliability, with a Cronbach's alpha of 0.799. Reliability testing was conducted by the authors prior to the main analysis, and these values are consistent with previously reported psychometric properties of the instruments in older adult populations.

Data Analysis

Data were analysed using appropriate statistical software. Categorical variables were presented as frequency distributions and percentages, while continuous variables were reported as means and standard deviations or medians and interquartile ranges, depending on the data distribution. Age was treated as a continuous variable and presented using descriptive statistics.

The relationship between the risk of sarcopenia, measured using the SARC-CalF score, and health-related quality of life, assessed using the EQ-5D index score, was analysed using Spearman's rank correlation coefficient. This test was chosen based on the finding that the data were not normally distributed.

Ethical considerations

This research protocol has been reviewed and approved by the Bani Saleh University Ethics Committee (Approval Number: EC.029/KEPK/STKBS/I/2025). All participants received a full explanation of the research objectives and procedures and provided written informed consent before participating.

RESULTS

This study was conducted in the working area of the Wanasari Community Health Centre, Bekasi Regency, West Java Province, Indonesia, which serves a population with urban-peri-urban characteristics and an increasing proportion of elderly residents. This community health centre oversees several villages that have ongoing public health activities for the elderly, such as elderly health posts (integrated service posts for the elderly) and regular health visit and education programmes. Data collection was conducted from February to March 2025, coinciding with scheduled public health activities and home visits coordinated with local health workers. Elderly people who met the eligibility criteria were approached consecutively, given an explanation of the purpose and procedures of the study, and invited to participate. Participants who met the inclusion criteria and provided written informed consent were then interviewed and assessed using standard instruments. A total of 305 elderly people living in the community with complete data were included in the final analysis.

Demographic Characteristics of Community-Dwelling Older Adults

Table 1 presents a summary of the sociodemographic and clinical characteristics of the study participants (n = 305). The table describes the distribution of respondents based on age group, gender, marital status, education level, employment status, monthly income, and comorbid conditions. The demographic characteristics of the respondents are detailed in the table 1.

Table 1. Frequency Distribution of Respondent Characteristics (n=305).

Characteristic	Category	
	n	%
Gender		
Male	118	38.7
Female	187	61.3
Age		
Elderly (60-74 Years)	284	93.1
Old (75-90 Years)	21	6.9
Mean age (Years) 64.65±5.20		
Marital Status		
Married	194	63.6
Not Married (Widowed)	111	36.4
Education		
No Schooling	38	12.5
Elementary	66	21.6
Junior High School	80	26.2
Senior High School	109	35.7
College/University	12	3.9
Employment		
Employed	76	24.9
Unemployed	229	75.1
Income		
≤ Regional Minimum Wage	304	99.7
> Regional Minimum Wage	1	0.3
History of Disease		
Hypertension	83	27.2
Diabetes	60	19.7
Joint Disorder	95	31.1
Heart Disease	5	1.6
Others	62	20.3

Sarcopenia and Quality of Life in Community-Dwelling Older Adults

Table 2 presents the distribution of participants based on their risk level for sarcopenia, as assessed using the SARC-CalF screening tool. The results show the proportion of community-dwelling older adults categorised as having a low risk of sarcopenia and those identified as being at risk of sarcopenia. Based on Table 2, although the majority of respondents (55.1%) were classified as having a low risk of sarcopenia, a significant proportion (44.9%) were identified as being at risk of sarcopenia.

Table 2. Distribution of Sarcopenia Risk Among Participants (n=305)

Risk of Sarcopenia Category	n	%
Low Risk of Sarcopenia	168	55.1
Risk of Sarcopenia	137	44.9

Note: Sarcopenia risk assessment was performed using the SARC-CalF instrument. Participants were classified as being at risk of sarcopenia based on the recommended SARC-CalF cut-off value.

Table 3 presents the distribution of participants according to health-related quality of life as measured using the EQ-5D-5L instrument. Quality of life was categorized into predefined levels based on the EQ-5D index score.

Table 3. Distribution of Health-Related Quality of Life Among Participants (n=305)

Quality of Life Category	n	%
Moderate Quality of Life	44	14.4
Good Quality od Life	261	85.6

Note: Health-related quality of life was assessed using the EQ-5D-5L index score and categorized according to predefined cut-off values.

Table 3 shows that the majority of participants reported a good quality of life, with 261 individuals (85.6%) classified as having good health-related quality of life, while 44 participants (14.4%) were categorized as having a moderate quality of life.

The Relationship Between Sarcopenia and Quality of Life in Community-Dwelling Older Adults

The results of association between two variables indicates negative correlation. Table 4 shows the relationship between the risk of sarcopenia, assessed using the SARC-CalF screening tool, and health-related quality of life, measured using the EQ-5D-5L index, in community-dwelling older adults. This table presents the measures of central tendency and distribution of both variables, as well as the strength and direction of the relationship analysed using Spearman's rank correlation.

Table 4. Association Between Sarcopenia Risk and Health-Related Quality of Life Among Community-Dwelling Older Adults (n=305)

Variable	*Mean*±SD	Median (Min-Max)	*Correlation Coeffisien*	*P. Value*
SARC-CalF Score	6.70±6.15	4 (0-20)	(-0.711)	0.001
EQ-5D-5L index score	0.83±0.15	0.83 (0.41-1.00)		

Note: The association between sarcopenia risk (SARC-CalF score) and health-related quality of life (EQ-5D-5L index score) was assessed using Spearman's rank correlation test.

The statistical test results show a p-value of 0.001, which is smaller than the significance level α = 0.05, and a correlation coefficient (r) of −0.711. These findings indicate a statistically significant relationship between sarcopenia and quality of life in elderly people living in the community. A negative correlation coefficient value indicates an inverse relationship, meaning that the higher the sarcopenia score, the lower the quality of life score, and vice versa. With an r value of −0.711, the strength of this relationship is considered strong.

DISCUSSION

Sarcopenia and Quality of Life in Community-Dwelling Older Adults

The results of this study indicate that 44.9% of the total 305 respondents are at risk of sarcopenia. This finding differs significantly from the study by Biben et al. (2016) which reported a prevalence of 9.1%. Another study by Muftiani (2023) also found that 30 elderly people (39%) were at risk of sarcopenia and showed that this condition could increase the risk of a decline in quality of life by up to 14.3 times. Prevention and management of sarcopenia include regular physical activity, adequate protein intake, and regular health monitoring. Although most elderly people in this study were reported to have a good quality of life, those at risk of sarcopenia require special attention. Integrated nursing interventions, such as physical exercise programmes, nutritional education, and psychosocial support, are important components in preventing further decline in function and quality of life.

Based on Roy's Adaptation Model, humans are viewed as adaptive individuals capable of responding to internal and external changes through four main modes of adaptation, namely physiological function, self-concept, role function, and interdependence. In this context, older adults at risk of sarcopenia still have the potential to maintain an optimal quality of life if they are able to adapt through social, family, and health service support. Previous research shows that not all elderly people with sarcopenia experience a decline in quality of life, as supportive environmental factors and psychological resilience can act as protective factors (Bian et al., 2023).

The Relationship between Sarcopenia and Quality of Life in Community-Dwelling Older Adults

This study demonstrates a strong inverse relationship between the risk of sarcopenia and health-related quality of life in community-dwelling older adults in Indonesia. Higher SARC-CalF scores, reflecting a greater risk of sarcopenia, were consistently associated with lower EQ-5D-5L index scores, indicating a poorer perception of health status across various dimensions of daily functioning.

These findings confirm that the risk of sarcopenia is a relevant and contributing factor to the decline in quality of life among older adults living in community settings.

These results are consistent with high-quality longitudinal evidence showing that sarcopenia is linked to declining quality of life over time. In a representative cohort of older adults in England, baseline sarcopenia was associated with worse quality-of-life outcomes at follow-up, supporting the notion that muscle loss has lasting impacts on wellbeing (Veronese et al., 2022; Wang et al., 2025). Meta-analytic work further confirms this relationship: pooled observational data indicate that sarcopenic individuals have lower health-related quality-of-life scores compared with non-sarcopenic peers, with disease-specific instruments (e.g., SarQoL) often showing greater discrimination of sarcopenia-related deficits (Beaudart et al., 2023).

Evidence from low- and middle-income settings and population studies similarly supports an association between sarcopenia (or severe sarcopenia) and poorer QoL, although effect sizes vary by context. Multi-country analyses suggest that the magnitude of association can depend on the prevalence of severe sarcopenia, country-level socioeconomic factors, nutritional status, and health-care access (Smith et al., 2022). A recent population-based study also documented domain-specific impacts of sarcopenia on physical and psychological QoL, reinforcing the multidimensional burden of muscle decline (West et al., 2025).

Several recent studies expand and nuance the simple bivariate association observed here. A cross-sectional study from rural Xinjiang (China) reported lower SarQoL scores among older adults with possible sarcopenia and sarcopenia, and identified multiple interacting factors (e.g., sensory impairments, comorbidities, social support) that influence QoL in these groups; this underscores the multifactorial pathways between muscle impairment and wellbeing (Che et al., 2025). In clinical populations, path analysis among older cancer patients demonstrated that sarcopenia affects quality of life both directly and indirectly via nutritional status and physical function, illustrating how sarcopenia may worsen QoL through downstream effects on mobility and nutrition (Wang et al., 2025). Studies using

imaging and condition-specific tools (e.g., ultrasound measures of rectus femoris, SarQoL further show that structural and functional muscle alterations are associated with worse sarcopenia-related QoL domains, supporting the plausibility of the observed association from multiple measurement perspectives (Tsekoura et al., 2026; Yalcin et al., 2024).

Measurement heterogeneity helps explain variation between studies. Research differs in whether sarcopenia is diagnosed using objective tests (DXA, bioimpedance, handgrip strength, gait speed) or screened with instruments such as SARC-CalF or SARC-F, disease-specific QoL instruments (SarQoL) can capture sarcopenia-related decrements more precisely than generic instruments (EQ-5D), but generic tools facilitate comparison across conditions and populations. Meta-analyses indicate that although the negative association between sarcopenia and QoL is robust, effect estimates vary by diagnostic criteria, QoL instrument, and study setting therefore, results should be interpreted in light of the assessment method used (Beaudart et al., 2023; Beaudart et al., 2024).

This study deliberately assessed risk of sarcopenia using SARC-CalF because it is pragmatic for community and primary-care contexts. It combines a brief functional questionnaire with calf circumference measurement and can identify older adults who may benefit from further assessment or early intervention. The trade-off is that screening instruments may misclassify some individuals compared with gold-standard diagnostic approaches. However, identifying those at elevated risk is nonetheless valuable for targeting preventive strategies before severe functional decline occurs. Our findings therefore point to the operational utility of screening in community programs while acknowledging measurement limitations.

Limitations of the present work warrant careful consideration. The cross-sectional design prevents inference about temporal or causal relationships between sarcopenia risk and QoL. Use of a screening tool rather than diagnostic tests (DXA, standardized grip strength and gait speed) may lead to over- or under-estimation of true sarcopenia prevalence and attenuate or inflate effect sizes. The sample was recruited by consecutive sampling from a single health-center catchment area, which may limit external generalizability to other Indonesian regions with different sociodemographic profiles. Finally, although analyses used complete records, future studies should report recruitment flow and non-participation in greater detail and, where possible, apply longitudinal or interventional designs to clarify causality and intervention impact.

From a nursing and public-health perspective, these findings have practical relevance. Routine, pragmatic screening for sarcopenia risk (for example, integration of SARC-CalF into community health posts) could help identify older adults at risk of QoL decline and direct them to timely interventions. Multimodal community programs combining progressive resistance and balance training, nutritional counselling (particularly to ensure adequate protein and energy intake), and management of comorbidities and sensory impairments may address both direct and indirect pathways linking sarcopenia to poorer QoL. Implementation research is needed to test feasible delivery models in primary-care settings and to evaluate their effects on function and QoL in Indonesian older populations.

CONCLUSION

This study shows a strong and statistically significant negative correlation between sarcopenia and quality of life in community-dwelling older adults, with a correlation coefficient of −0.711 ($p = 0.0001$). These findings indicate that lower severity of sarcopenia is associated with better quality of life. Sarcopenia has a multidimensional impact on quality of life, encompassing physical, psychological, and social aspects. Therefore, early detection and prevention of sarcopenia should be a priority in community nursing services, through the implementation of physical exercise programmes, optimisation of nutritional intake, and continuous health education. These efforts are expected to maintain muscle function while improving the quality of life of community-dwelling older adults.

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AUTHOR CONTRIBUTION

AP: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft, Project Administration.
MWKl: Conceptualization, Methodology, Investigation, Data Curation.
AMA: Writing – Original Draft, Writing – Review & Editing, Supervision.
PA:: Data Curation, Formal Analysis, Writing – Original Draft.
IP: Writing – Original Draft, Writing – Review & Editing.
ASI: Writing – Review & Editing, Final Approval of the Manuscript.

ETHICAL APPROVAL AND CONSENT

This research protocol has been reviewed and approved by the Bani Saleh University Ethics Committee (Approval Number: EC.029/KEPK/STKBS/I/2025). All participants received a full explanation of the research objectives and procedures and provided written informed consent before participating.

FUNDING SOURCES

This study received no external funding.

PROTOCOL REGISTRATION

This study was not registered.

CONFLICT OF INTEREST

The authors hereby declare that there's no conflict of interest in this study, either to any institutions or individuals.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are not publicly available due to privacy or ethical restrictions. However, they are available from the corresponding author on reasonable request and with permission from Bani Saleh University.

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