Knee Pain and Quality of Life among The Elderly

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A B S T R A C T

Introduction: The aging process can lead to knee pain in the elderly, which negatively impacts their quality of life by decreasing their physical functioning and potentially affecting their psychological well-being over time. This study aimed to determine the association between knee pain and the quality of life of the elderly.

Methods: This analytical study involved elderly patients aged 60 years and over who presented with complaints of knee pain at the Geriatric Outpatient Clinic of Universitas Airlangga Hospital, Surabaya, Indonesia, from September 2022 to March 2023. The participants were selected by consecutive sampling until a total of 50 samples were collected using the interview method. The independent variable was knee pain, while the dependent variable was quality of life. The instruments used were the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) to measure knee pain and the Barthel Index for Activities of Daily Living (ADL) to assess the quality of life. The data were analyzed using Spearman's rho, with $p<0.01$ indicating a significant correlation.

Results: The majority of the elderly were female (54%) and fell within the age group of 66–70 years. The most prevalent complaint was mild knee pain (52%). A total of 50% of the elderly had an independent quality of life. A strong correlation was found between the degree of knee pain and quality of life in the elderly ($p=0.000$). The correlation coefficient indicated an inverse relationship between the degree of knee pain and quality of life in the elderly.

Conclusion: The findings suggest that the higher the pain degree suffered by the elderly, the lower their quality of life.

Keywords: Knee pain; quality-adjusted life-year; elderly; Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC); Barthel Index for Activities of Daily Living (ADL)

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Highlights:
1. This study evaluated the factors that influence the quality of life of elderly individuals with knee pain, an issue that has been relatively overlooked in Indonesia.
2. The results of this study will hopefully assist scholars and stakeholders, enabling them to optimize the quality of life for elderly individuals experiencing knee discomfort.

INTRODUCTION

Knee pain is a major health issue in numerous countries. Elderly individuals are particularly susceptible to this condition, which can have a substantial impact on their mood and physical function. In industrialized countries, the elderly population is growing at a rapid pace, which has led to a rising prevalence of knee discomfort. Knee pain may negatively impact one's quality of life due to discomfort, limited mobility, reduced social activities, and mood swings (Kim et al., 2015). In general, elderly individuals experience the process of aging throughout their entire body (Priambodo & Wijayanti, 2020; Duong et al., 2023). Due to a rise in life expectancy, Indonesia is currently entering an elderly population phase. This demographic shift will be followed by an increase in the elderly population, projected to reach 25.9 million

in 2020, accounting for approximately 9.7% of the total population. This will be a rise from 18 million in 2010, which constituted around 7.56% of the total population. By 2035, there will be 48.2 million elderly, which amounts to around 15.77% of the total population (Widyawati, 2019).

Acute knee pain can emerge from an acute injury to the meniscus or knee ligaments. Meanwhile, chronic knee pain is usually caused by osteoarthritis (OA), which occurs due to focal cartilage loss (Hosny et al., 2012; Basha et al., 2020). In 2017, the World Health Organization estimated that 9.6% of men and 18.0% of adults aged over 60 years globally suffered from symptomatic osteoarthritis. Among them, up to 80% experienced movement limitations, and 25% encountered difficulties in carrying out daily activities. About 70–90% of the 40 million people in the United States who are 75 years of age and older suffer from osteoarthritis. In Indonesia, it is estimated that 30% of the population aged 40–60 years has osteoarthritis. The prevalence rate of osteoarthritis has increased to 65% in the population aged 61 years and over (Afriansyah & Wijaya, 2020). According to data from medical records, 190 patients suffering from knee osteoarthritis were treated in the Medical Rehabilitation Clinic of Universitas Airlangga Hospital, Surabaya, Indonesia, throughout 2017. As many as 79 individuals (41.57%) out of the 190 patients were over 60 years old. At Universitas Airlangga Hospital, the majority of knee osteoarthritis patients were women, accounting for 75.8%, or 144 individuals.

Apart from structural injuries to the knee, there are various factors that contribute to pain in the knee. The root cause of chronic knee pain is the presence of central and peripheral sensitivity. The relationship between mood disorders and knee pain suggests that changes in both peripheral and central nociceptive processes, as well as high levels of psychological discomfort such as sadness, fear, and worry, lead to the persistence of pain and physical boundaries. Anxiety and depression can negatively impact a person's quality of life in the presence of knee pain by altering how they perceive pain and how they function physically (Tavares et al., 2020). To determine the extent of a patient's trauma and to assess any changes in symptoms and function over a period of time, it is necessary to use a questionnaire that covers both short-term and long-term consequences. The instruments used for patient follow-up in osteoarthritis cases should have the potential to monitor the consequences of acute injury in physically active and younger patients, as well as the chronic outcomes of older patients.

The concept of quality of life is subjective and has historically been debated as being difficult to measure and define. Nevertheless, it can generally be understood as a multifaceted concept that emphasizes an individual's self-perception of their current state of mind. To get a useful explanation, it is critical to perceive quality of life as a notion made up of several factors, including social, environmental, psychological, and physical values (Theofilou, 2013; Siette et al., 2021). Knee joint pain that persists from day to day could affect physical function and daily activities. This is because the occurrence of pain in the knee joint causes an uncomfortable sensation that hinders movement. This could certainly reduce the quality of life, particularly for the elderly. Therefore, it is necessary to determine whether there is an association between knee joint pain and the quality of life of the elderly.

METHODS

This study was descriptive-analytic with a cross-sectional approach. The data were collected through a short interview method. The research was guided by the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) questionnaire for the knee pain examination and the Barthel Index for Activities of Daily Living (ADL) questionnaire for the quality-of-life assessment. These questionnaires served as a tool for data collection. The WOMAC questionnaire was selected due to its widespread usage as the primary instrument for gauging the level of pain experienced by patients suffering from knee osteoarthritis (Sathiyanarayanan et al., 2017). The maximum attainable score for the WOMAC questionnaire was 96. A higher score on this questionnaire indicated a greater level of pain, tension, and impaired physical function experienced by an individual. The patients were classified into four groups of knee pain severity depending on their score: mild (0–24), moderate (24–48), severe (48–71), or extremely severe (72–96). To facilitate robust interpretation and simplify calculation, the overall WOMAC scores were further analyzed and transformed into a scale (Ackerman et al., 2014; Razek & El-Basyouni, 2016). Furthermore, the patients were classified as having a high risk (>70%) or low risk (≤70%) (Sathiyanarayanan et al., 2017). The test-retest reliability values were categorized according to the intraclass correlation coefficient (ICC): 0.65–0.98 for pain, 0.52–0.89 for stiffness, and 0.71–0.96 for physical function (Thanaya et al., 2021).

The ADL questionnaire was employed to measure the independence or functional ability of the elderly in carrying out daily life activities. This ADL questionnaire served as a tool to assess the quality of life of the elderly by covering ten items regarding activities of daily living (ADLs), including eating, bathing, dressing, defecating, peeing, using the toilet, transferring from a chair, moving, and climbing and descending stairs. The results were classified into four categories depending on the score: total dependence (0–4), heavy dependence (5-8), moderate dependence (9–11), light dependence (12–19), and independence (20). The maximum attainable score for the ADL questionnaire was 20 points (Ramadhan et al., 2015).

The study population consisted of elderly patients, aged 60 years and over, who presented with a complaint of knee discomfort at the Geriatric Outpatient Clinic of Universitas Airlangga Hospital, Surabaya, Indonesia, during the period from September 2022 to March 2023. The inclusion criteria for this study were elderly individuals aged 60 years of age and over who were able to see, read, and write and were willing to sign an informed consent form for study participation. A total of 50 patients met the inclusion requirements to participate in this study. Patients with long-term conditions that could seriously impair their quality of life, such as those who were disabled, suffering from cancer, or undergoing chemotherapy, were excluded from this study. Age, sex, occupation, and knee pain were the independent variables. The dependent variable measured in this study was the quality of life of the elderly (Flannelly et al., 2014).

A univariate analysis was performed to examine the data and figure out the link between the risk factors. The Spearman's rho test was employed for the bivariate analysis to assess the association between the elderly's quality of life and knee pain. A value below 0.01 was determined as an indication of a significant correlation (Joshi & Jamadar, 2022). After all the data had been gathered, they were processed using IBM SPSS Statistics for Windows, version

25.0 (IBM Corp., Armonk, NY, USA).

RESULTS

The participants in this study comprised a total of 50 patients. Table 1 shows the distribution of the elderly patients aged 60 years and over who visited the Geriatric Outpatient Clinic at Univeritas Airlangga Hospital, Surabaya, Indonesia, with complaints of knee pain. Out of the 50 elderly patients, the majority were female, accounting for 27 individuals (54%). Most of the elderly patients belonged to the age group of 65–70 years, comprising a total of 25 individuals (50%). The occupational distribution of the elderly patients showed that more than half of them, amounting to 34 individuals (68%), were retirees.

Table 1. Characteristics of the study subjects

Characteristics	n	%
Sex		
Male	23	46
Female	27	54
Age (y.o.)		
60–65	3	6
66–70	25	50
71–75	13	26
76–80	6	12
81–85	2	4
86–90	1	2
Occupation		
Retiree	34	68
Housewife	16	32

Note: y.o. = years old.

Table 2. Distribution of knee pain and quality of life

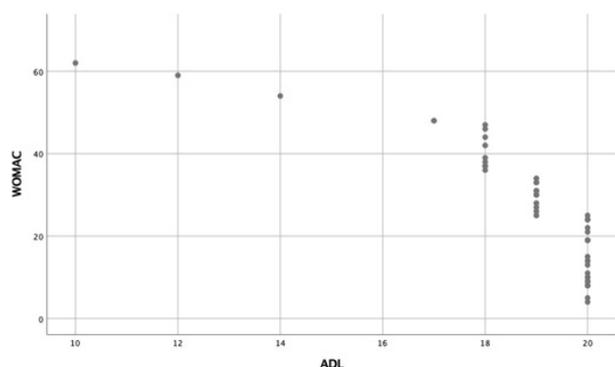| Quality of life	Pain severity					
	Mild		Moderate		Severe	
	n	%	n	%	n	%
Independence	25	50	0	0	0	0
Mild dependence	1	2	21	42	2	4
Moderate dependence	0	0	0	0	1	2
Severe dependence	0	0	0	0	0	0
Total dependence	0	0	0	0	0	0

Figure 1. Graph of the relationship between knee pain and quality of life

Table 2 exhibits the quality of life of the elderly patients according to their knee pain severity. Meanwhile, Figure 2 illustrates the scale of the correlation between the two variables to facilitate a more precise analysis. It was discovered that the elderly patients predominantly had an independent quality of life, which accounted for 50% of the total participants. Hence, there was a strong correlation between the severity of knee pain and the quality of life of the elderly patients ($\rho = -0.926$; $p = 0.000$). The analysis of the two variables indicated an inverse correlation, implying that the higher the WOMAC score, the lower the ADL score, and vice versa. If the WOMAC score decreased, the ADL score increased. According to these results, it could be inferred that the higher the severity of knee pain experienced by elderly patients, the lower their quality of life.

DISCUSSION

The results of this study showed that most of the elderly patients were female, accounting for 54% of the total participants. This is in line with a study conducted at Dr. Zainoel Abidin Regional General Hospital, Banda Aceh, Indonesia, from March 2020 to February 2022. The largest proportion of the osteoarthritis patients at the hospital were found to be female, with a percentage of 63.3% (Rosita et al., 2018).

This study further revealed that the predominant age group consisted of individuals aged between 66 and 70 years, with 25 (50%) elderly patients belonging to this category. However, this result does not align with a study conducted by Alisiya et al. (2021) at Universitas Airlangga Hospital, Surabaya, Indonesia, which examined body mass index (BMI), age of menarche, parity, hormonal contraception, and knee osteoarthritis in female patients. In the study, the age group that was the most prevalent comprised the participants who were 56–60 years old, accounting for 18 individuals (62.1%). The study also found that the non-osteoarthritis group mostly consisted of research subjects in the age range of 51–55 years, with a total of 15 individuals (60%). This difference might be due to the degenerative condition and variation in age grouping between our study and the aforementioned study. Degenerative disease is a medical condition that appears simultaneously with time. The elderly are highly susceptible to degenerative diseases because these conditions are related to the aging process (Rosita et al., 2021).

The occupational distribution revealed that the subjects in this study were predominantly retirees, with as many as 34 individuals (68%). These results differ from those of a study conducted by Pratiwi et al. (2023), who examined the quality of life of elderly patients with osteoarthritis at the Pangean Community Health Center, Kuantan Singingi, Indonesia. They found that the majority of the elderly respondents still had an active occupational status. Another study conducted by Isnaini et al. (2017) analyzed factors related to the quality of life of osteoarthritis patients at the Kalijudan Community Health Center, Surabaya, Indonesia. The study reported that a large proportion of the respondents, specifically 67%, were still working as farmers, construction workers, or laborers. The difference between our study and prior research could be attributed to variations in geographic location, which might have an influence on the research results. Differences in daily activities, occupation, body weight, and degenerative diseases could also affect the results of the study.

This study revealed that the majority of the participants, specifically 26 elderly patients (52%), experienced mild knee pain. However, the mild severity of pain was not the most commonly observed in another cohort of knee osteoarthritis patients. A previous study conducted by Afina et al. (2019) examined the correlation between the degree of pain, radiological classification, and the quality of life of knee osteoarthritis patients. It was found that most of the subjects experienced moderate pain, as reported by 43 participants (51%). The previous study focused on elderly individuals with knee pain in general, whereas this present study mainly examined elderly participants who were suffering from osteoarthritis. This could lead to inconsistent and different results between the studies.

According to the findings of this study, it can be inferred that the quality of life of the elderly was adequate. This conclusion is drawn from the results of the quality of life measurement, which showed that 25 out of 50 elderly individuals (50%) demonstrated a high level of independence. The findings are consistent with a previous investigation carried out by Darwis & Safei (2022), which reported that 73.3% of elderly individuals did not show signs of weakness, and 59.3% of them did not experience depression. These findings suggest that the majority of the elderly maintain a good quality of life. However, it is important to note that frailty, which is commonly experienced by the elderly, can lead to a decline in physical functioning. This decline can potentially result in depression and eventually decrease their overall quality of life.

Farrokhi et al. (2016) conducted a study to examine the influence of knee pain location on symptoms, functional status, and the quality of life related to knee functioning in older adults with chronic knee pain. According to their analysis of data obtained from the Osteoarthritis Initiative database, which included 2,959 knee pain cases, the researchers found that individuals with mixed pain were more likely to experience difficulties in everyday weight-bearing activities that required bending the knee. This had a negative impact on their overall quality of life, in comparison to patients who only experienced pain in the tibiofemoral or patellofemoral areas. The finding supports the inverse correlation between pain and quality of life that was observed in this study, indicating that the higher the pain severity, the lower the elderly's quality of life.

A different study undertaken by Kiadaliri et al. (2016) reported the quality of life of 1,300 participants from Malmö, Sweden. The assessment of the quality of life was conducted by examining knee pain and several criteria for diagnosing osteoarthritis in the knee. According to the study, individuals who had both osteoarthritis and knee pain exhibited overall lower scores in the health-related quality of life (HRQOL) questionnaire compared to participants who did not have osteoarthritis but experienced knee discomfort. This indicates that osteoarthritis patients experience a diminished quality of life due to more severe knee pain. The resulting inverse relationship between pain and quality of life corroborates the findings of this study.

In a separate study carried out at the Pangean Community Health Center, Kuantan Singingi, Indonesia, Pratiwi et al. (2023) examined the quality of life of 87 elderly patients who suffered from osteoarthritis. The quality of life of the elderly participants was assessed across four domains: physical, psychological, social relations, and environmental health. They found that most of the elderly individuals exhibited a low quality of life in the physical and psychological health domains, while demonstrating a high quality of life in the social relations and environmental health domains.

A prior study was conducted by Wijianto et al. (2021) to investigate the correlation between the intensity of pain and the quality of life in patients who experienced knee osteoarthritis. The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the World Health Organization Quality of Life Brief Version (WHOQOL-BREF) questionnaires were utilized in their analysis. In their findings, they revealed a correlation between the intensity of pain and the quality of life of 15 elderly participants. Consistent with this study, they determined that knee osteoarthritis has a negative correlation with quality of life. The increasing intensity of pain in elderly individuals with knee osteoarthritis leads to a decline in their quality of life.

This study has the advantage of focusing on a specific demographic, namely elderly individuals aged 60 and over who suffered from knee pain. The questionnaire employed was innovative, as it was simple to use and apply in basic care, making it suitable for administration by general practitioners. One limitation of our study is the absence of an analysis of the correlation between social relations, physical activity, and an individual's overall quality of life. Furthermore, we have not addressed how knee discomfort affects the quality of life of elderly individuals. We hope that future research will look into the relationship between social bonds, physical activity, and the overall quality of life of the elderly, as well as the extent of the impact of knee discomfort on the quality of life of the elderly. This study might also be overblown due to its cross-sectional nature and poor causal link.

CONCLUSION

This study suggests that there is a strong correlation between the severity of knee pain and the quality of life of elderly individuals. According to the inverse correlation observed, the quality of life for elderly individuals may diminish as the severity of knee pain increases. Nevertheless, the majority of the participants in this study, who presented with complaints of mild knee pain at the Geriatric Outpatient Clinic of Universitas Airlangga Hospital, Surabaya, Indonesia, exhibited independence in the assessment of their quality of life.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest related to the conduct of this study.

ETHICS CONSIDERATION

The ethical approval for this study was issued by the Health Research Ethics Committee of Universitas Airlangga Hospital, Surabaya, Indonesia, with registration No. 085/KEP/2022 on August 23, 2022. The authors provided the patients with information regarding the different types, procedures, and operations of the questionnaire. Before commencing the research, the patients were directly asked for their voluntary participation in this clinical trial through informed consent. The data are not accessible to the general

public and are exclusively shared with the authors.

AUTHOR CONTRIBUTION
ANM contributed to the conception and design, analysis and interpretation of the data, drafting of the article, provision of administrative, technical, and logistic support, as well as the collection and assembly of the data. NN and EY performed the critical revision of the article for important intellectual content and provided final approval of the article. LD contributed to the critical revision of the article for important intellectual content, final approval of the article, and statistical expertise. PZR provided the study materials and patients.

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