



Correlation between Grade of Knee Osteoarthritis with Quality of Life of Patient in Secondary Referral Hospital in Indonesia

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Abstract

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BACKGROUND: Osteoarthritis (OA) is a disorder that occurs in the joints and is the leading cause of pain and disability in adults. In Indonesia, the prevalence of osteoarthritis is still high; it was 15.5% in men and 12.7% in women, out of around 225 million Indonesians. Several factors cause osteoarthritis, including aging, genetics, obesity, gender, and the type of work done by the patient.

AIM: This study aimed to determine the relationship between the grade of knee osteoarthritis based on the Kellgren and Lawrence system with a decrease in quality of life in patients and to determine the decrease in quality of life based on the gender of the patient at Baptis Hospital, Batu.

METHODS: This study used a cross-sectional design with a sample size of 31 people who suffer from knee osteoarthritis patients at Baptis Hospital, Batu City. Data collection was carried out directly from respondents using the Short-Form 36 (SF-36) questionnaire.

RESULTS: The results showed that nine respondents (29%) had grade 1 osteoarthritis, ten respondents had grade 2 osteoarthritis (32.3%), and 12 respondents (38.7%) had grade 3 osteoarthritis. About 38.7% of patients have a good quality of life, whereas 61.3% patients have a poor quality of life. It shows that most of the 31 patients suffering from knee osteoarthritis who participated in this research have a poor quality of life. The Chi-Square test showed a significant relationship ($p < 0.05$) between an increase in the grade of knee osteoarthritis and a decrease in the quality of life of patients.

CONCLUSION: There was a significant relationship between the grade of knee osteoarthritis and quality of life of patients in general, but not significant based on gender.

Introduction

Osteoarthritis is a disorder of one or more joints and is local, progressive, and degenerative [1], which is a common ground for high-cost medical consultation and often causes a decrease in quality of life [2]. In Indonesia, the prevalence of osteoarthritis based on age is high, with 15.5% in men and 12.7% in women, and 70% of patients with osteoarthritis over 65 years old [3]. With diagnosis by medical personnel in Indonesia, osteoarthritis is increasing at an age, where the highest prevalence is at the age of 75 years [4].

There are some risk factors for osteoarthritis, including aging, obesity, genetics, gender (more predisposition in women), hormonal (women), and ethnicity (predisposition in Asians and Caucasians). Lower risk factors, or secondary factors, of osteoarthritis, include occupation, physical activity, muscle weakness, early menopause, hypertension, diabetes, and post-oophorectomy [2]. Physiological problems that arise due to osteoarthritis in the form of pain can decrease

the quality of life expectancy, such as excessive fatigue, decreased range of motion, and pain [5]. One of the risk factors for osteoarthritis is gender, which has a relationship with osteoarthritis presentation and treatment. In general, female patients come for treatment of osteoarthritis at a higher stage and tend to feel more pain than male patients [6].

The aim of this study is to determine the relationship between the grade of knee osteoarthritis based on the Kellgren and Lawrence system and decreased quality of life in patients at Baptis Hospital, Batu and to determine the decreased quality of life based on gender.

Research Method

This research proposal has been reviewed and approved by the ethical committee from the Faculty of

Medicine, Universitas Brawijaya, as mentioned in the ethical clearance certificate No 73/EC/KEPK/03/2020. This research used a cross-sectional study approach from April to May 2020. The population in this research patients of Orthopaedic and Traumatology in Baptis Hospital, Batu, East Java, who suffered from knee osteoarthritis. Data were collected with medical records, the Short-Form 36 questionnaire to determine quality of life, and the Kellgren and Lawrence system to assess the grade of knee osteoarthritis. For inclusion criteria, patients who suffer from knee osteoarthritis are confirmed by radiological examination and are willing to be interviewed. The exclusion criteria in this research were patients who suffer from pain in the knees that are not caused by osteoarthritis but by other diseases such as knee injury, rheumatoid arthritis, gout arthritis, or infection. Data in this research were analyzed using the correlation test, Chi-square. This research hypothesized that there would be a relationship between the grade of osteoarthritis and a decreased quality of life of patients at Baptis Hospital, Batu, in general or based on gender.

Results

The total number of respondents was collected in this research which was 31 patients.

Based on Table 1, more patients with osteoarthritis occur at the age of more than 50 years (90.3%). The distribution of respondents' gender data shows that women (71%) suffer from osteoarthritis more than men. From the distribution of occupation status data, it was found that the incidence of knee osteoarthritis was higher in people not actively working (74.2%) compared to those actively working (25.8%). In terms of quality of life, it shows that patients with knee osteoarthritis have a poor quality of life (61.3%), which depends on the grade of osteoarthritis, compared to a good quality of life. About 29% of respondents suffer from grade 1 knee osteoarthritis, 32.3% of respondents suffer from grade 2 knee osteoarthritis, and 38.7% of respondents suffer from grade 3 knee osteoarthritis. It shows that of the 31 patients in Baptis Hospital, Batu, that participated in this research, most suffered from grade 3 knee osteoarthritis. Besides that, 38.7% of patients have a good quality of life, whereas 61.3% of patients have a poor quality of life. It shows that most of the 31 patients suffering from knee osteoarthritis who participated in this research have a poor quality of life.

Analysis results from the relationship between the grade of knee osteoarthritis and the quality of a patient's life (Table 2), shows that 22.6% of patients who suffer from grade 1 knee osteoarthritis have

good quality of life, but 6.5% of patients with grade 1 knee osteoarthritis have a poor quality of life. It shows that most patients who suffer from grade 1 knee osteoarthritis have a good quality of life. About 9.7% of patients with grade 2 knee osteoarthritis have a good quality of life and 22.6% have a poor quality of life. It shows that most grade 2 knee osteoarthritis patients have a poor quality of life. Then, 6.5% of patients with grade 3 knee osteoarthritis have a good quality of life, but 32.3% of patients have a poor quality of life. It shows that patients with grade 3 knee osteoarthritis have a poor quality of life.

Table 1: General characteristic data

Characteristic	n	%
Age (years)		
<50	3	9.7
>50	28	90.3
Gender		
Male	9	29
Female	22	71
Occupation		
Not working	23	74.2
Working	8	25.8
Grade of osteoarthritis		
Grade 1	9	29
Grade 2	10	32.3
Grade 3	12	38.7
Quality of life		
Good	12	38.7
Poor	19	61.3

The Chi-square test was used to determine the relationship between the grade of knee osteoarthritis and the quality of life. Based on Table 2, the probability value from the Chi-square test is 0.014, which indicates a probability < level of significance (α). The interpretation is that there is a significant relationship between the grade of knee osteoarthritis and the quality of life of patient's at Baptis Hospital, Batu.

Table 2: The relationship between the grade of knee osteoarthritis and quality of life

Grade of knee osteoarthritis	Quality of life				Total		p-value
	Good		Poor		n	%	
	n	%	n	%			
Grade 1	7	22.6	2	6.5	9	29	0.014
Grade 2	3	9.7	7	22.6	10	32.3	
Grade 3	2	6.5	10	32.3	12	38.7	
Total	12	38.7	19	61.3	31	100	

Based on Table 3, the result of the Chi-square test is $p = 0.051$ in males and $p = 0.0113$ in females. It can be concluded that there is no significant relationship between the grade of knee osteoarthritis and the quality of life based on gender.

Table 3: The gender-specific relationship between knee osteoarthritis and quality of life

Gender	Grade of osteoarthritis	Quality of life				Total		p-value
		Good		Poor		n	%	
		n	%	N	%			
Male	Grade 1	3	100	0	0	3	100	0.051
	Grade 2	0	0	2	100	2	100	
	Grade 3	1	25	3	75	4	100	
Female	Grade 1	4	66.7	2	33.3	6	100	
	Grade 2	3	37.5	5	62.5	8	100	
	Grade 3	1	12.5	7	87.5	8	100	

Discussion

The total number of respondents in this research was 31 patients. Respondents chose by consecutive sampling. An interview using the SF-36 questionnaire to determine eight domains of quality of life, including physical function, pain in the body, general health, vitality of life, social functioning, and emotional and mental health roles. Quality of life in health fields is often associated with specific approaches including satisfaction or well-being of an individual in health or sick condition or currently on treatment [7]. This research used the SF-36 questionnaire, which measures eight life domains divided into the physical composite score and the mental composite score. The score for this questionnaire ranged between 0 and 100. The higher the value obtained, the quality of life of the individual can be said to be good [8].

This research found patients suffering from grade 1 knee osteoarthritis to be nine patients, ten patients with grade 2 knee osteoarthritis, and 12 patients with grade 3 knee osteoarthritis. From the 31 respondents, 12 have a good quality of life and 19 respondents have a poor quality of life. This result is supported by research conducted by Vitaloni *et al.* [9], which states that the quality of life of patients with knee osteoarthritis can be affected by some factors, including gender, weight, physical activity, mental health, and educational background. Knee osteoarthritis patients who experienced a decrease in quality of life caused by inflammation, limited function, and low mood [10]. It is because osteoarthritis is the main cause of pain and global disability that can be caused by limited social relationships and, if it occurs in the long term, will reduce the patient's quality of life. Therefore, the purpose of treatment for knee osteoarthritis is to reduce pain caused by the inflammatory process.

Other risk factors that play a role in the decrease in quality of life of patients with knee osteoarthritis are gender, age, weight, physical activity, education, and psychological factors. Research by Vitaloni *et al.* [9] states that getting older can decrease the quality of a patient's life and make it worse. When men and women's quality of life are compared, women will have a lower quality of life. Besides that, obesity is also a risk factor for osteoarthritis because it can increase pain and limit function caused by the load placed on inflamed joints and the narrowing of the intra-articular space. It can cause increased pain and stiffness in joints and cause atrophy in muscles in the knee. The relationship between osteoarthritis and the presence or absence of obesity is to increase the morbidity and mortality of patients and will reduce the quality of their lives, especially in the elderly.

Most respondents in this research are women, Vina *et al.* [11] state that a decrease in daily activities is more common in women compared to men. Women

have risk factors of knee osteoarthritis higher than men caused by low levels of endogenous sex hormones that are associated with effusion synovitis in the knee joint that only occurs in women.

The result of this research shows that for patients who suffer from knee osteoarthritis with higher grades, the quality of their life will be lower than patients with lower grades. The Chi-square test shows that the grade of osteoarthritis has a significant relationship ($p < 0.05$) with the quality of life of patients at Baptis Hospital, Batu (Table 2). This result coincides with the study of Mahmoud *et al.* [12] that the higher the grade of osteoarthritis, the more it will affect the patient's quality of life. It is because of some risk factors, including gender, age, obesity, hypertension, diabetes mellitus, and other diseases related to patients' social life. The higher the degree of osteoarthritis, the more limited the patient's functional ability. As a result, patients' physical activity is reduced.

The Chi-square correlation test shows there is no significant relationship between quality of life and degree of knee osteoarthritis based on gender (Table 3). In this research, women with knee osteoarthritis don't have a job. A study by Mahmoud *et al.* [12] examines how physical activities affect the quality of life in women who do not work, finding that patients who do not work have a lower quality of life than those who work. This can be attributed to the social support and social interaction you get at work. Kiadaliri *et al.* [13] state that pain that arises in knee osteoarthritis is the main cause of the decreased quality of life. A study by Nikolic *et al.* [14] states that the radiological examination severity plays an important role in the decrease in quality of someone's life.

There are still some limitations to this research. The number of samples used is still relatively small; there were 31 patients, so it was less representative of the total population. In addition, researchers have not provided other criteria that may affect the degree of osteoarthritis. As a result, for future research, researchers can increase the number of samples and include additional criteria such as comorbid diseases in patients, genetics, obesity, or hypertension. Hence, it can be known more specifically about the quality of life of patients with knee osteoarthritis. Nonetheless, this study can be used as a guideline for the treatment of osteoarthritis that can help improve the quality of life of patients.

Conclusion

There is a significant relationship between grade osteoarthritis and the quality of life of patients at Baptis Hospital, Batu, in general, but not significant based on gender.

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