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Comparison of Quality of Life Between Combined Therapy and Additional Corticosteroid Injections in Advanced Knee Osteoarthritis at Siti Khodijah Hospital

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ABSTRACT

Background: Knee osteoarthritis (OA) causes pain, stiffness, and functional decline, reducing quality of life. Objective: This study compared the quality of life of advanced knee OA patients (Kellgren–Lawrence grade 3–4) receiving the combination of pharmacological and physiotherapy treatment alone and those who received the same combination with the addition of intra-articular corticosteroid injections. Methods: This research is a quantitative analytic observational study using cross-sectional collecting method involving 44 patients diagnosed in the year of 2023 with advanced knee OA at Siti Khodijah Sidoarjo Hospital. Data were collected through medical records and WOMAC questionnaires, and analyzed using the Mann–Whitney U test and mean rank comparison between treatment groups. Results showed that the injection group had significantly lower WOMAC Scores (19.2 ± 14.0) compared to the non-injection group (35.07 ± 8.6) and p-value of 0.000 ($p < 0.05$). Conclusion: The addition of intra-articular corticosteroid injections significantly improves the quality of life in patients with advanced knee OA.

KEYWORDS:
Knee Osteoarthritis, Quality of Life, WOMAC, Corticosteroid Injection, Combined Therapy

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INTRODUCTION

Osteoarthritis (OA) is a common degenerative joint disease marked by progressive cartilage degradation, osteophyte formation, subchondral bone changes, and mild synovial inflammation (1). Knee OA is a leading cause of disability among the elderly, significantly impacting daily activities, quality of life, and healthcare burden (2). The Global Burden of Disease 2019 report estimated over 528 million individuals globally suffer from OA, with the highest prevalence in individuals over 55 years old, predominantly females (3).

In Indonesia, knee OA affects approximately 15.5% of men and 12.7% of women aged 40–60 years (4). OA impairs physical and psychosocial functions, leading to sleep disturbances, social isolation, and increased risk of depression (5). Given this significant burden and its multidimensional impact, appropriate and timely therapeutic management is crucial to reduce symptoms and prevent further functional decline.

Patients with OA require therapy to relieve symptoms. Treatment for knee OA can be categorized into non-surgical and surgical approaches. Non-surgical management is further divided into non-pharmacological and pharmacological therapies. Non-pharmacological therapy is the first-line treatment for all OA patients and includes education, self-management, and physiotherapy such as exercise and weight reduction

(6–8). Pharmacological therapy may involve the use of topical or oral NSAIDs, or intra-articular injections of corticosteroids or hyaluronic acid (9–11). Surgical procedures are considered the last resort for patients with knee OA, with total knee arthroplasty followed by rehabilitation being the most effective surgical intervention (4).

The effectiveness of corticosteroid injections in improving long-term quality of life remains debated (12). Although short-term improvements in pain and function are well-documented, repeated use may lead to cartilage degeneration (13,14).

This study aims to compare the effectiveness of combined pharmacological-physiotherapy treatment with and without intra-articular corticosteroid injections in improving the quality of life of patients with advanced knee OA using the *Western Ontario and McMaster Universities Osteoarthritis* (WOMAC) index. The findings are expected to aid clinicians in selecting evidence-based treatment strategies.

METHODS

This observational analytic study employed a cross-sectional design, conducted at Siti Khodijah Sidoarjo Hospital. The population included 44 patients diagnosed with grade 3 or 4 knee OA based on Kellgren-Lawrence classification who met the inclusion and exclusion criteria. The sample was divided into two groups: one group received pharmacological and physiotherapy treatment only; and the other group received the same treatment plus intra-articular corticosteroid injections.

Data were collected from medical records and WOMAC questionnaires. WOMAC questionnaires is a valid and reliable instrument that measures patient's pain, stiffness, and physical function knee related quality of life (10). The WOMAC measurement was conducted among patients with varying durations of treatment exposure. Specifically, the longest treatment duration dated back to 2022, while the most recent treatment initiation occurred in 2024. Therefore, the interval between treatment initiation and WOMAC measurement ranged from 2 to 4 years.

The primary outcome of this study was the quality of life of each treatment group, assessed using WOMAC scores after treatment. The independent variable was the type of therapy (combination of pharmacologic and physiotherapy treatment vs. same treatment plus intra-articular corticosteroid injections).

Data analysis was performed by using the Mann-Whitney U test and mean rank WOMAC score between the therapy. This test was used to assess whether there was a statistically significant difference in the patient's quality of life between the two treatment groups.

RESULT AND DISCUSSION

This study involved 44 respondents diagnosed with advanced knee osteoarthritis (grade 3–4 based on the Kellgren-Lawrence scale), consisting of 14

patients receiving combined pharmacological and physiotherapy treatment, and 30 patients who received additional intra-articular corticosteroid injections. The respondents were predominantly female (90.9%), in line with OA epidemiology, which shows a higher prevalence among postmenopausal women due to hormonal and biomechanical changes. The age distribution of the respondents ranged from 35 to 74 years, with the 55–64 age group being the most represented.

Based on medical records and WOMAC questionnaire data, most patients receiving additional corticosteroid injections were categorized as experiencing milder pain, while the non-injection group reported moderate to severe symptoms. Higher radiological grades of OA (grade 4) were also more frequently found in the injection therapy group.

Table 1. Characteristic of Respondent

Characteristics	Therapy	
	Pharmacological and Physiotherapy (Combination) **14 (31,8%)**	**Combination with Intra-articular Corticosteroid Injection 14 (31,8%)**
Sex		
Male	2 (4,5%)	2 (4,5%)
Female	12 (27,3%)	28 (63,6%)
Age		
35–44	0 (0,0%)	1 (2,3%)
44–54	6 (13,6%)	5 (11,4%)
55–64	3 (6,8%)	14 (31,8%)
65–74	5 (11,4%)	10 (22,7%)
Kellgren-Lawrence OA Grade		
Grade 3	11 (25,0%)	16 (36,4%)
Grade 4	3 (6,8%)	14 (31,8%)

(Source: Author, 2025)

The mean WOMAC score shows that patients receiving corticosteroid injections had lower WOMAC scores (mean 19.2 ± 14.0) compared to those without injections (mean 35.07 ± 8.6). The combination group was classified as moderate, whereas the group with the addition of intra-articular corticosteroid injection was classified as mild, based on WOMAC interpretation.

Table 2. Univariate Analysis of WOMAC Scores

Therapy	N	WOMAC Score (Mean ± SD)	Median	Category
Pharmacological and Physiotherapy (Combination)	14	35,07 ± 8,6	34.0	Moderate
Combination with Intra-articular Corticosteroid Injection	30	19,2 ± 14,0	15.0	Mild

(Source: Author, 2025)

Based on the results of the Mann-Whitney U test, $Z = -3.701$, $p < 0.001$ were obtained. Highly significant p-value indicates that the difference between the two treatment groups is statistically significant. In other words, there is a clear difference in the quality of life of patients with advanced knee osteoarthritis who received a combination of pharmacological and physiotherapy treatment with the addition of intra-articular corticosteroid injections compared to those who received pharmacological and physiotherapy treatment without corticosteroid injections.

Table 3. Mann-Whitney U Test Results

Kelompok	Mean Rank	Z score	Asymp. Sig. (p - value)
Pharmacological and Physiotherapy (Combination)	18,23	-3,701	0,000
Combination with Intra-articular Corticosteroid Injection	31,64		

(Source: Author, 2025)

The results of this study indicate a significant difference in the quality of life of patients with advanced knee osteoarthritis (OA) between the two treatment groups. The group receiving a combination of pharmacological and physiotherapy treatment with the addition of intra-articular corticosteroid injections recorded significantly lower WOMAC scores compared to the group that received pharmacological and physiotherapy treatment without injections. This difference in scores reflects improvement in the domains of pain, stiffness, and physical function, which are key determinants of quality of life in OA patients.

These findings are consistent with a previous study by Tammachote et al. (2016), which showed that intra-articular corticosteroid injections were effective in reducing pain and improving knee function in OA patients for 4–6 weeks post-intervention. The analgesic effect of corticosteroids is attributed to their ability to suppress inflammation by inhibiting the production of prostaglandins and proinflammatory cytokines (IL-1, TNF-α), which play a major role in cartilage degradation. Additionally, direct injection into the joint cavity allows for high local drug concentrations with minimal systemic effects (15).

In this study, the non-injection group had a mean WOMAC score of 35.07 (moderate category), while the injection group recorded a mean score of 19.2 (mild category). These data suggest that intra-articular corticosteroid injections not only provide temporary relief but also contribute to an overall improvement in quality of life including reduced dependence on oral pharmacotherapy, increased mobility, and greater comfort in daily activities.

These findings also affirm the sensitivity of the WOMAC index as a tool for measuring quality of life and detecting clinical changes in OA patients. The three main domains of the WOMAC—pain, stiffness, and physical function—are highly relevant in determining patient disability and well-being. The significant reduction in WOMAC scores in the injection group reflects clinically meaningful improvement across all three domains.

However, the long-term effectiveness of intra-articular corticosteroid injections remains controversial. A study by McAlindon et al. (2017) reported that repeated corticosteroid uses over two years led to greater cartilage thinning in the knee joint compared to the placebo group, despite patients reporting subjective improvement (14).

Therefore, the Indonesian Rheumatology Association (2014) recommends that corticosteroid injections should not be administered more than three times per year, especially in weight-bearing joints, to avoid destructive effects on the cartilage (4).

Based on the study data, the patient with the longest treatment duration had received adjunctive corticosteroid injections since 2022, whereas the

most recent patient began receiving them in 2024. Accordingly, for the patient with the longest duration, the injection period had exceeded two years. This surpasses the risk threshold described by Timothy E. McAlindon et al. (2017), who reported that repeated corticosteroid uses over two years than two years may increase the risk of cartilage thinning in knee joint, despite patients reporting subjective improvement.

On the other hand, this practice remains consistent with the recommendations of the Indonesian Rheumatology Association (2014), provided that the frequency of administration does not exceed three injections per year, as the guideline does not specify a cumulative duration limit.

This study has several limitations. Its cross-sectional design captures only a single time point and does not allow for evaluation of long-term changes resulting from the interventions. Additionally, the use of total sampling from a single hospital with a limited population may restrict the generalizability of the results. The WOMAC questionnaire, while quantitative, also relies on patients' subjective perceptions, which can be influenced by emotional and psychosocial factors.

Nevertheless, the findings of this study provide strong clinical implications. Integrating intra-articular corticosteroid injections into the treatment regimen for advanced knee OA can be an effective strategy to significantly improve patients' quality of life. Particularly in secondary healthcare facilities such as RS Siti Khodijah Sidoarjo, this approach is relatively practical, cost-effective, and can provide rapid symptom relief.

CONCLUSION

Intra-articular corticosteroid injections significantly improve quality of life in advanced knee OA patients when added to pharmacological and physiotherapy treatments. This approach should be considered in personalized, non-operative treatment plans. However, cautious use is recommended due to potential adverse long-term effects on cartilage.

As a recommendation, future studies using longitudinal research designs are needed to comprehensively evaluate long-term outcomes and capture developmental trajectories over extended periods. Such an approach would allow researchers to observe patterns of change, stability, and causal relationships that may not be apparent in cross-sectional investigations. By incorporating repeated measurements across time points, future research could produce more robust, generalizable, and theoretically meaningful findings.

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