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Original Research Article

The Impact of Analgesic Medication on Quality of Life Among Rheumatoid Arthritis Patients

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Abstract: *Rheumatoid arthritis is a chronic autoimmune inflammatory disorder that substantially compromises physical function, mental well-being, and health-related quality of life.* ***Objective:*** *To assess health-related quality of life in patients with rheumatoid arthritis using the EuroQol-5D instrument and to evaluate treatment-related outcomes.* ***Methods:*** *A descriptive cross-sectional study was conducted among 25 patients diagnosed with rheumatoid arthritis attending the Outpatient Department of Fuji Foundation Hospital. Data were collected over a defined study period using the EuroQol-5D questionnaire to evaluate mobility, self-care, usual activities, pain or discomfort, and anxiety or depression. Information regarding pharmacological treatment was also recorded. Statistical analysis was performed using descriptive statistics, and results were expressed as frequencies and percentages.* ***Results:*** *The analysis demonstrated marked impairment across all EuroQol-5D domains, particularly in pain or discomfort and limitations in usual activities. Regarding treatment patterns, 16% of patients were receiving disease-modifying antirheumatic drugs, 52% were on analgesic monotherapy, and 24% were treated with a combination of analgesics and disease-modifying antirheumatic drugs. Patients receiving combination therapy showed better therapeutic outcomes and higher quality-of-life scores than those on monotherapy.* ***Conclusion:*** *Rheumatoid arthritis significantly impairs health-related quality of life across physical and psychological domains. Combination therapy with analgesics and disease-modifying antirheumatic drugs appears to be associated with improved outcomes. Comprehensive management strategies addressing both physical symptoms and mental health are essential to enhance the quality of life in patients with rheumatoid arthritis.*

Keywords: Anti-Citrullinated Protein Antibodies, Cyclooxygenase-2, Disease-Modifying Antirheumatic Drugs, Genome-Wide Association Studies, Interleukins, Rheumatoid Arthritis

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Introduction

Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disorder characterized by persistent synovial joint inflammation, resulting in pain, stiffness, swelling, and progressive joint destruction that may ultimately lead to deformity (1). The disease develops when the immune system mistakenly targets the synovium, triggering a sustained inflammatory response that damages cartilage, ligaments, tendons, and bone. In advanced cases, RA may extend beyond the joints, causing systemic involvement of the skin, eyes, lungs, cardiovascular system, and blood vessels (2). RA most commonly presents between the ages of 30 and 50 years, although it can occur at any age, with higher prevalence reported in specific populations, including Native Americans and individuals residing in developed countries (3,4). Owing to its progressive and disabling nature, RA has a profound negative impact on health-related quality of life (HRQoL), significantly impairing physical function, daily activities, and psychosocial well-being if not adequately managed (5,6).

The pathophysiology of RA involves a complex interplay between innate and adaptive immune mechanisms. B lymphocytes produce rheumatoid factor and anti-citrullinated protein antibodies, which promote immune complex formation and perpetuate synovial inflammation (7,8). Activated CD4+ T cells interact with antigen-presenting cells and release pro-inflammatory cytokines, including interleukin-1, interleukin-6, and tumor necrosis factor, thereby amplifying the inflammatory cascade and contributing to joint destruction (9). Clinically, RA often progresses from non-specific early manifestations, such as fatigue, low-grade fever, and prolonged morning stiffness, to established synovitis, joint deformities, and marked functional limitations in later stages of the disease (10).

Effective management of RA requires a comprehensive therapeutic approach aimed at alleviating pain, suppressing inflammation, and preventing irreversible structural damage (11). Analgesics, including nonsteroidal anti-inflammatory drugs, paracetamol, opioids, and corticosteroids, play a central role in symptomatic relief and maintenance of daily functioning; however, they do not alter disease progression (12). In contrast, disease-modifying antirheumatic drugs, such as methotrexate, leflunomide, hydroxychloroquine, and biologic or targeted synthetic agents, are essential for controlling immune-mediated inflammation and slowing joint damage (13). Evidence suggests that combination therapy with both analgesics and DMARDs provides superior therapeutic outcomes compared with monotherapy, as it addresses both symptom control and underlying disease mechanisms (14).

Given the chronic course of RA and its multidimensional impact on physical, emotional, and social health, assessment of HRQoL is a critical component of patient care. Standardized instruments such as the EuroQol-5D provide valuable insight into disease burden by evaluating mobility, self-care, usual activities, pain or discomfort, and anxiety or depression (15). This study aims to assess HRQoL among patients with rheumatoid arthritis attending the Outpatient Department at Fuji Foundation Hospital

and to explore the association between medication regimens and therapeutic outcomes, emphasizing the need for integrated management strategies to optimize patient well-being and quality of life.

Methodology

This prospective cross-sectional study evaluated the impact of analgesic use on the health-related quality of life of patients with rheumatoid arthritis. The study was conducted at the Outpatient Department of Fauji Foundation Hospital, located on Jhelum Road in Rawalpindi. A convenience sampling technique was employed due to time and logistical constraints. Patients from different age groups attending the outpatient clinic, as well as those affiliated with rheumatoid arthritis support groups, were approached for participation. Although the current sample size was limited to 25 participants, the study is intended to expand to approximately 300 participants in future phases to allow for more robust, generalizable conclusions.

Patients with a confirmed diagnosis of rheumatoid arthritis for at least 3 months were eligible for inclusion in the study. Individuals with associated comorbidities were also included to reflect real-world clinical practice. Patients younger than 18 years of age were excluded from participation. All eligibility criteria, including age and diagnosis duration, were verified before enrollment.

Ethical approval was obtained before the study began. Written and verbal informed consent was secured from all participants. Patients were informed about the objectives of the study, assured of the confidentiality and anonymity of their responses, and advised of their right to withdraw from the study at any point without any consequences to their medical care.

Data were collected using the EuroQol-5D instrument, a validated and widely used generic tool for assessing health-related quality of life. The instrument evaluates five core dimensions, including mobility, self-care, usual activities, pain or discomfort, and anxiety or depression. While the original EQ-5D comprises three levels of severity for each dimension, this study adopted a five-level severity structure consisting of no problem, slight problem, moderate problem, severe problem, and extreme problem to enhance sensitivity in capturing patient-reported outcomes. In addition, a standardized pain scale was used to assess pain severity among participants. The questionnaire used in this study is provided as Appendix A.

Data collection was conducted through interviewer-administered questionnaires to ensure clarity and completeness of responses. Demographic characteristics, clinical status, pain severity, and quality of life were recorded. Details of prescribed medications for rheumatoid arthritis, including analgesics and disease-modifying antirheumatic drugs, were obtained through a review of patients' outpatient medical records. Medication names, dosages, and therapy duration were extracted for analysis.

The primary variables assessed in this study included the five EQ-5D dimensions, along with participants' demographic and clinical characteristics. Data analysis was descriptive, given the exploratory scope and the study's limited sample size. Findings were summarized to evaluate patterns in quality-of-life outcomes across medication regimens.

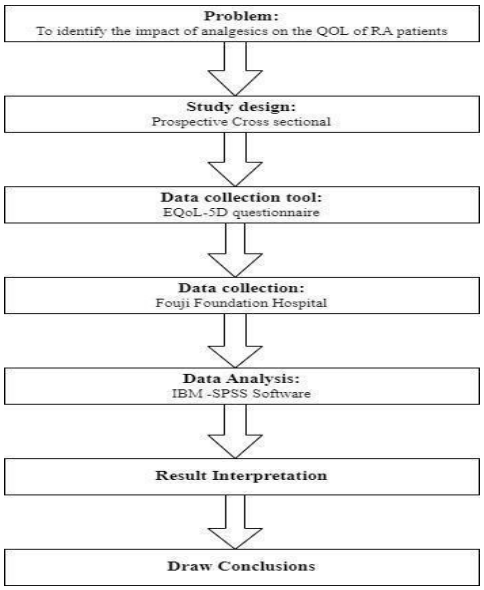

Figure 1: Flowchart of Research Methodology

Results

A total of 25 patients with confirmed rheumatoid arthritis were included in the study. Most participants were aged 45-64 years (64%), followed by those aged 35–44 years (20%). Females constituted the majority of the study population (96%). Most participants were married (96%), had an education below matric level (64%), and all participants were unemployed (100%). (Table 1)

Table 1. Socio-demographic characteristics of participants (N = 25)

Variable	Category	n	%
Age (years)	22–34	2	8
	35–44	5	20
	45–64	16	64
	>65	2	8
Gender	Female	24	96
	Male	1	4
Marital status	Married	24	96

	Unmarried	1	4
Education level	Under-matric	16	64
	Matric	8	32
	Undergraduate	1	4
Employment status	Unemployed	25	100

Sixty percent of participants were in the early stage of rheumatoid arthritis, 24% in the intermediate stage, and 16% in the late stage. Disease duration ranged from less than 1 year to over 20 years, with the majority (60%) reporting 1–10 years.

Regarding pharmacological treatment, analgesic monotherapy was the most common regimen (52%), followed by combination therapy with analgesics and DMARDs (24%). Comorbid conditions were present in 68% of participants, with cardiovascular disease being the most frequently reported comorbidity. (Table 2)

Table 2. Clinical characteristics and treatment patterns of participants (N = 25)

Variable	Category	n	%
Stage of RA	Early	15	60
	Intermediate	6	24
	Late	4	16
Disease duration	<1 year	3	12
	1–10 years	15	60
	10–20 years	5	20
	20–30 years	2	8
Medication regimen	DMARDs only	4	16
	Analgesics only	13	52
	Analgesic combinations	2	8
	Analgesics + DMARDs	6	24
Comorbidities	None	8	32
	Cardiovascular disease	5	20
	Diabetes	2	8
	Diabetes + CVD	2	8
	Depression	1	4
	Asthma	1	4
	Others	6	24

EQ-5D assessment revealed substantial impairment across all five dimensions. Severe problems were most frequently reported in mobility (52%) and pain or discomfort (52%). Severe anxiety or depression was reported by 44% of participants. (Table 3)

Table 3. EQ-5D health status profile of participants (N = 25)

Dimension	None n (%)	Slight n (%)	Moderate n (%)	Severe n (%)
Mobility	6 (24)	4 (16)	2 (8)	13 (52)
Self-care	6 (24)	5 (20)	4 (16)	10 (40)
Usual activities	4 (16)	7 (28)	4 (16)	10 (40)
Pain/Discomfort	6 (24)	4 (16)	2 (8)	13 (52)
Anxiety/Depression	8 (32)	3 (12)	3 (12)	11 (44)

Patients receiving combination therapy with analgesics and DMARDs demonstrated the most favorable outcomes across all EQ-5D domains. Analgesic monotherapy was associated with higher levels of pain, impaired mobility, and psychological distress. (Table 4)

Table 4. Pain and functional status according to the medication regimen

Domain	DMARDs	Analgesics only	Analgesic combinations	Analgesics + DMARDs
Mobility	Slight problem	Severe problem	Moderate problem	No problem
Self-care	Slight problem	Moderate problem	Moderate problem	No problem
Usual activities	Slight problem	Moderate problem	Moderate problem	No problem
Pain/Discomfort	Slight problem	Severe problem	Moderate problem	No problem
Anxiety/Depression	No problem	Severe problem	Slight problem	No problem

Chi-square analysis demonstrated statistically significant associations between medication regimen and all EQ-5D dimensions, including mobility, self-care, usual activities, pain, and anxiety or depression ($p < 0.001$). (Table 5)

Table 5. Association between medication regimen and quality-of-life domains

Variable Pair	χ^2	df	p-value
Medication vs Mobility	75.000	9	<0.001
Medication vs Self-care	49.183	9	<0.001
Medication vs Usual activities	57.692	9	<0.001
Medication vs Pain	75.000	9	<0.001
Medication vs Anxiety/Depression	46.875	9	<0.001

Discussion

This study provides important insights into the demographic and clinical characteristics of patients with rheumatoid arthritis (RA) and their corresponding quality of life (QoL) outcomes. The marked predominance of female participants (96 percent) is consistent with global epidemiological data, including the work of Singh et al. (16) and Katchamart et al. (17), who observed significantly higher RA prevalence among women. This gender disparity has been attributed to biological and hormonal influences that modulate immune function and inflammatory pathways (17). The clustering of participants within the 45–64 year age group (64 percent) further mirrors established demographic patterns, indicating mid-life as the peak onset period for RA (18).

The high proportion of married participants (96 percent) suggests the presence of social support structures that may influence coping mechanisms in chronic diseases. While social support is widely regarded as beneficial for psychological well-being, the current dataset lacked direct evidence of a statistically significant association; thus, no specific citations are linked to this observation. The finding that 64 percent of patients had education levels below matric raises substantial concerns about health literacy. Existing literature, such as the work of Ionescu et al. (19), demonstrates the relationship between lower educational attainment, poor understanding of disease processes, and suboptimal treatment adherence in chronic illnesses, including RA.

Clinically, most patients presented with early-stage RA (60 percent), consistent with previous studies indicating that early diagnosis is increasingly common due to improved screening and awareness (17). Disease duration predominantly fell within one to ten years (60 percent), a range that reflects the chronic yet manageable trajectory of RA when early and appropriate intervention is initiated. Meta-analytic evidence has repeatedly demonstrated that timely treatment initiation modifies disease progression and long-term outcomes (18).

Treatment patterns in this study reveal a reliance on analgesic monotherapy (52 percent), a practice that remains common in low-resource settings despite its limitations. Prior literature highlights that while analgesics may offer symptomatic relief, they do not influence underlying inflammatory activity, underscoring the need for DMARDs to achieve optimal disease control (20). The increased use of combination therapies among patients with comorbidities (68 percent) further supports evidence suggesting that complex clinical presentations often necessitate multidimensional management strategies (21).

The EQ-5D assessments in this study indicate substantial impairment in mobility and pain/discomfort domains (52 percent), reaffirming the well-established burden of physical limitations and chronic pain in RA populations. Haridoss et al. (22) similarly reported significant QoL reductions related to functional disability and persistent pain. Mental health disturbances were also prevalent, with 44 percent of participants exhibiting severe anxiety or depression. This finding is in line with Katchamart et al. (17), who noted elevated psychological morbidity among RA cohorts, highlighting the necessity for integrated mental health screening and support within routine RA care.

A notable finding from this study is the significant association between medication regimens and QoL outcomes, as demonstrated by chi-square analysis showing strong correlations across EQ-5D domains ($p < 0.001$). Patients receiving DMARD-based regimens experienced markedly better QoL than those relying solely on analgesics. This observation aligns with the findings of Haridoss et al. (22), who reported improved physical function and psychosocial well-being with optimized pharmacological management. The pattern is further supported by Ionescu et al. (19) and Zhang et al. (23), who emphasized the detrimental consequences of untreated or inadequately treated chronic inflammation, affecting both physical and mental health.

Collectively, these results illuminate a cascading relationship: effective control of inflammation leads to reduced pain, improved mobility, stabilization of psychological well-being, and ultimately enhanced QoL. The reliance on analgesic monotherapy identified in this study represents a critical gap in treatment practices. Evidence strongly suggests that such an approach may exacerbate long-term morbidity, particularly when inflammatory processes remain unaddressed (19, 23). Therefore, a shift toward comprehensive RA management integrating DMARDs, patient education, and mental health support is imperative.

This study's findings signify the necessity for a multidimensional approach to treatment in RA, focusing not just on physical symptoms but also on integrating mental health support systems. The alignment of these results with the recent literature underscores the urgency of systemic changes in RA management to improve overall quality of life for affected individuals.

A limitation of the study is a small sample size, which could limit the applicability of the results to a larger population. Therefore, to confirm, research will proceed involving bigger and more diverse sample sizes. Notwithstanding the limitations, the study emphasized developing better clinical practices and effective interventions to gain better therapeutic outcomes and to improve the quality of life of RA patients.

Conclusion

The study reveals a profound impact of rheumatoid arthritis (RA) on patients' daily functioning and mental well-being. A significant proportion of patients experienced severe pain (52%) and considerable mobility issues (48%), highlighting the urgent need for effective pain management and mobility support strategies. The findings indicated that 44% of patients were suffering from severe anxiety, emphasizing the importance of incorporating mental health support into RA management. The use of disease-modifying antirheumatic drugs (DMARDs), either alone or in combination with analgesics, showed potential to improve mobility and reduce pain, with 16% of patients on DMARDs alone and 24% on combination therapy. However, the prevalence of analgesic monotherapy (52%) suggested the need for further integration and analysis of various treatment approaches. These results underscore the necessity for a holistic treatment strategy that addresses both the physical and psychological aspects of RA to enhance the overall quality of life for RA patients significantly.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-24)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

AN
*Study design, conception of study, supervision, manuscript drafting***.**
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Manuscript drafting, study design, conception of study.
ETB
Methodology development, data interpretation, critical manuscript review.
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Literature review, data collection, manuscript editing.
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Data collection, quality of life assessment, manuscript drafting.
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Statistical analysis, data interpretation.
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Data analysis, technical review, manuscript revision.
OMM
Review of literature, data entry, data analysis, and drafting article.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Sharif K, Sharif A, Jumah F, Oskouian R, Tubbs RS. Rheumatoid arthritis in review: clinical, anatomical, cellular, and molecular points of view. Clin Anat. 2018;31(2):216-223. https://doi.org/10.1002/ca.23028
2. Bhattaram P, Chandrasekharan U. The joint synovium: a critical determinant of articular cartilage fate in inflammatory joint diseases. Semin Cell Dev Biol. 2017;62:86-93. https://doi.org/10.1016/j.semcdb.2016.05.007
3. Ferucci ED, Templin DW, Lanier AP. Rheumatoid arthritis in American Indians and Alaska Natives: a review of the literature. Semin Arthritis Rheum. 2005;34(4):662-667. https://doi.org/10.1016/j.semarthrit.2004.08.003
4. Kvien TK. Epidemiology and burden of illness of rheumatoid arthritis. Pharmacoeconomics. 2004;22(Suppl 1):1-12. https://doi.org/10.2165/00019053-200422001-00002
5. Katchamart W, Narongroeknawin P, Chanapai W, Thaweeratthakul P. Health-related quality of life in patients with rheumatoid arthritis. BMC Rheumatol. 2019;3:34. https://doi.org/10.1186/s41927-019-0080-9
6. Gullick NJ, Ibrahim F, Scott IC, Vincent A, Cope AP, Garrood T, et al. Real-world long-term impact of intensive treatment on disease activity, disability, and health-related quality of life in rheumatoid arthritis. BMC Rheumatol. 2019;3:6. https://doi.org/10.1186/s41927-019-0054-y
7. Nurchis MC, Sessa G, Pascucci D, Sassano M, Lombi L, Damiani G. Interprofessional collaboration and diabetes management in primary care: a systematic review and meta-analysis of patient-reported outcomes. J Pers Med. 2022;12(4):643. https://doi.org/10.3390/jpm12040643
8. Wu F, Gao J, Kang J, Wang X, Niu Q, Liu J, et al. B Cells in rheumatoid arthritis: pathogenic mechanisms and treatment prospects. Front Immunol. 2021;12:750753. https://doi.org/10.3389/fimmu.2021.750753
9. Markovics A, Rosenthal KS, Mikecz K, Carambula RE, Ciemielewski JC, Zimmerman DH. Restoring the balance between pro-inflammatory and anti-inflammatory cytokines in the treatment of rheumatoid arthritis: new insights from animal models. Biomedicines. 2021;10(1):44. https://doi.org/10.3390/biomedicines10010044
10. Frazzei G, van Vollenhoven RF, de Jong BA, Siegelaar SE, van Schaardenburg D. Preclinical autoimmune disease: a comparison of rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis and type 1 diabetes. Front Immunol. 2022;13:899372. https://doi.org/10.3389/fimmu.2022.899372
11. Mueller AL, Payandeh Z, Mohammadkhani N, Mubarak SM, Zakeri A, Alagheband Bahrami A, et al. Recent advances in understanding the pathogenesis of rheumatoid arthritis: new treatment strategies. Cells. 2021;10(11):3017. https://doi.org/10.3390/cells10113017
12. Konzett V, Aletaha D. Management strategies in rheumatoid arthritis. Nat Rev Rheumatol. 2024;20(12):760-769. https://doi.org/10.1038/s41584-024-01169-7
13. Ghazanfari MR, Sepehrnia S. Reviewing advances in rheumatoid arthritis treatment: from disease-modifying antirheumatic drugs to innovative drug delivery systems. Immunoregulation. 2024;6(2):105-118. https://doi.org/10.32598/Immunoregulation.6.2.4
14. Chi XK, Xu XL, Chen BY, Su J, Du YZ. Combining nanotechnology with monoclonal antibody drugs for rheumatoid arthritis treatments. J Nanobiotechnology. 2023;21(1):105. https://doi.org/10.1186/s12951-023-01857-8
15. Amer M, Ahmed S, Akhlaq M, Bibi H, Ishfaq M, Arshad MN, et al. Assessment of health-related quality of life among patients of rheumatoid arthritis in Rawalpindi: a cross-sectional study. Clin Epidemiol Glob Health. 2025;35:102151. https://doi.org/10.1016/j.cegh.2025.102151
16. Singh G, Mahajan N, Abrol S, Raina A. Anxiety and depression are common in rheumatoid arthritis and correlate with poor quality of life in Indian patients. Reumatologia. 2021;59(6):386-393. https://doi.org/10.5114/reum.2021.112351
17. Katchamart W, Narongroeknawin P, Chanapai W, Thaweeratthakul P, Srisomnuek A. Prevalence of and factors associated with depression and anxiety in patients with rheumatoid arthritis: a multicenter prospective cross-sectional study. Int J Rheum Dis. 2020;23(3):302-308. https://doi.org/10.1111/1756-185X.13781
18. Baliga S, Samant R, Balakrishnan C. Mental health and rheumatoid arthritis. Ann Rheum Dis. 2023;82(Suppl 1):1351-1352. https://doi.org/10.1136/annrheumdis-2023-eular.6117
19. Ionescu C, Popescu C, Agache M, Dinache G, Codreanu C. Depression in rheumatoid arthritis: prevalence and effects on disease activity. J Clin Med. 2024;13(7):2058. https://doi.org/10.3390/jcm13072058
20. Isnardi CA, Capelusnik D, Schneeberger EE, Bazzarelli M, Berloco L, Blanco E, et al. Depression is a major determinant of functional capacity in rheumatoid arthritis. J Clin Rheumatol. 2021;27(6 Suppl): S180-S185. https://doi.org/10.1097/RHU.0000000000001506
21. Zhou T, Guan H, Wang L, Zhang Y, Rui M, Ma A. Health-related quality of life in patients with different diseases measured with the EQ-5D-5L: a systematic review. Front Public Health. 2021;9:675523. https://doi.org/10.3389/fpubh.2021.675523
22. Haridoss M, Bagepally BS, Natarajan M. Health-related quality of life in rheumatoid arthritis: systematic review and meta-analysis of EuroQoL EQ-5D utility scores from Asia. Int J Rheum Dis. 2021;24(3):314-326. https://doi.org/10.1111/1756-185X.14066
23. Zhang S, Chen Y, Wang Y, Wang H, Yao D, Chen G. Tau accumulation in the spinal cord contributes to chronic inflammatory pain by upregulation of IL-1β and BDNF. Neurosci Bull. 2024;40(4):466-482. https://doi.org/10.1007/s12264-023-01152-4