International Journal of Science and Research (IJSR) ISSN: 2319-7064 Impact Factor 2024: 7.101

Health- Related Quality-of-Life in Rheumatoid Arthritis Assessed by Short-Form 36 and its Relation to Disease Activity

Kottu Lakshmi Tejaswi¹, Rajeswari S.², Balaji C.³, Nidhi Ramesh Prabhu⁴, Akanksha S.⁵, Tejas M.⁶, Tarik⁷, Vishali⁸

¹Post graduate, Department of Clinical Immunology and Rheumatology, SRIHER, Chennai, India Corresponding Author Email: *tejaswikottu99[at]gmail.com*

²Professor and HOD, Department of Clinical Immunology and Rheumatology, SRIHER, Chennai, India

³Professor, Department of Clinical Immunology and Rheumatology, SRIHER, Chennai, India

^{4, 5, 6}Post graduate, Department of Clinical Immunology and Rheumatology, SRIHER, Chennai, India

^{7,8}Medical officer, Department of Clinical Immunology and Rheumatology, SRIHER, Chennai, India

Abstract: <u>Background</u>: Rheumatoid arthritis (RA) impacts both physical and mental well-being, with health-related quality of life (HRQoL) often prioritized by patients over laboratory or clinical parameters. Poor QoL is associated with increased healthcare utilization. <u>Objective</u>: To assess HRQoL in RA patients and its correlation with disease activity. <u>Methods</u>: This cross-sectional study was conducted at SRIHER, Chennai, from March to June 2024. RA patients fulfilling ACR/EULAR 2010 criteria were included. HRQoL was measured using the SF-36 questionnaire, assessing eight domains and two summary scores—Physical Component Summary (PCS) and Mental Component Summary (MCS). Disease activity was measured using DAS28-ESR. <u>Results</u>: Among 100 patients (86% female, mean age 51.9 ± 11.3 years), 54% had RA >5 years. Mean DAS28 was 3.4 ± 1.3. Females had significantly lower PCS and MCS scores. Longer disease duration correlated with lower HRQoL. DAS28 showed a strong negative correlation with PCS (r = -0.791) and MCS (r = -0.620), both p < 0.001. <u>Conclusion</u>: HRQoL declines with higher disease activity and longer disease duration in rheumatoid arthritis. Females with rheumatoid arthritis have poorer HRQoL scores compared to males. Physical domain of HRQoL is affected more than mental domain in RA.

Keywords: Rheumatoid Arthritis, Health-Related Quality of Life (HRQoL), SF-36 Questionnaire, DAS28-ESR, Disease Activity

1. Introduction

Rheumatoid arthritis (RA) is a chronic, systemic autoimmune disorder predominantly affecting synovial joints. In the absence of timely and appropriate treatment, the disease can lead to progressive bone erosion, joint damage, and deformities [1]. Patients with RA frequently endure persistent pain and fatigue, contributing to significant long-term morbidity. These symptoms, along with functional limitations secondary to joint destruction, have a profound negative impact on health-related quality of life (HRQoL) [2, 3]. RA adversely affects both physical and psychological dimensions of health and well-being [4].

Diminished HRQoL in RA has been associated with increased healthcare utilization, a higher incidence of mental health disorders such as anxiety and depression, and reduced life expectancy [5, 6]. In the context of a disease with no definitive cure, patients often prioritize improvements in HRQoL over traditional clinical parameters, such as inflammatory markers (e.g., erythrocyte sedimentation rate [ESR], C-reactive protein [CRP]) and joint counts [7]. Systematic assessment of HRQoL enables clinicians to identify the most impacted domains of patients' lives, personalize therapeutic interventions, and monitor treatment response [8]. The 36-Item Short Form Health Survey (SF-36), developed as part of the Medical Outcomes Study, is a widely utilized instrument for assessing HRQoL across a range of clinical conditions [9]. In RA, the SF-36 has demonstrated good reliability and validity, correlating strongly with diseasespecific measures such as the Health Assessment Questionnaire (HAQ) and the Arthritis Impact Measurement Scales (AIMS) [10]. As a generic tool, the SF-36 also facilitates comparison of HRQoL across different diseases and with general population norms [11].

Previous studies have identified several factors associated with impaired HRQoL in RA, including pain, higher disease activity, advanced age, and reduced physical function [12, 13]. However, data regarding HRQoL and its determinants in patients with RA from South India are limited. The present study aims to address this knowledge gap and contribute to the existing literature on RA-related quality of life in this underrepresented population [14].

2. Material and Methods

This cross-sectional study was conducted at the Department of Rheumatology, Sri Ramchandra Institute of Higher Education (SRIHER), Chennai, South India from March 2024 to June 2024. Patients aged ≥ 18 years, with RA as diagnosed by the revised ACR/EULAR 2010 classification criteria for RA were included in the study.

Volume 14 Issue 4, April 2025 Fully Refereed | Open Access | Double Blind Peer Reviewed Journal www.ijsr.net

This study aims to assess HRQoL among patients with RA and its correlation to disease activity.

Demographic data, complete medical history, and clinical examination details were collected.

HRQOL Assessment

The 36-item short-form health survey (SF-36)

HRQoL was assessed using a Short-Form 36 (SF-36) questionnaire which measures eight scales: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH) and 2 summary scores: physical component summary (PCS) and mental component summary (MCS). It comprises 36 questions.

SF-36 domains were scored from 0 to 100 with higher scores denoting better QoL.

Disease Activity Assessment

Disease activity was assessed using (DAS28-ESR) Disease activity Score in 28 joints (Both shoulders, elbows, wrists, joints, metacarpophalangeal and knees, proximal interphalangeal joints) which comprises four variables: Swollen tender joint count, tender joint count, Erythrocyte Sedimentation Rate (ESR) and visual analog scale for general health status and global disease activity scored by the patient from 0 to 100 points with higher scores denoting worse disease. The disease is classified as in remission (DAS28 <2.6), low disease activity (DAS28 \geq 2.6 \leq 3.2), moderate activity (DAS28 >3.2 \leq 5.1), and high disease activity (DAS28 >5.1).

Statistical Analysis

Statistical Package for Social Sciences (SPSS version 21) was used for data analysis. Categorical data was expressed as frequencies and percentages. Numerical data were expressed as the mean and standard deviation for normally distributed data. Comparison between the two groups for the mean difference was done by independent sample t-test/ Mann-Whitney μ test. The correlation between DAS28-ESR and HRQOL scores was identified using Spearman's correlation. The p-value < 0.05 was considered statistically significant.

3. Results

100 RA patients were included in the study with the majority being females (86%) with the mean age \pm SD of 51.9 \pm 11.3 years. The mean disease duration \pm SD was 6.3 \pm 5.8 years with the majority of patients suffering from RA for a period of <5 years (46%), 5 to 10 years (39%), followed by >10 years (15%). The mean DAS28 score \pm SD of the study population was 3.4 \pm 1.3 with remission, low disease activity, and moderate and high disease activity in 31%, 24%, 29 and 16% respectively. The majority of the patients were unemployed (79%). 72% of the patients felt burdened by the hospital expenses and 30% of the caretakers felt burdened.

Among the eight domains of SF-36, role limitation owing to physical health (RP) had the lowest score (mean \pm SD of 64 \pm 43.2). The physical component summary had a lower score

than the mental component summary (mean	\pm SD of 45.1 \pm
$12.2 \text{ vs } 49.2 \pm 13.4$).	

Table 1: SF-36 scores	s in RA patients
-----------------------	------------------

Table 1. 51 50 secres in 101 patients		
Scores	Mean \pm SD	
Physical functioning	73.8 ± 21.7	
Role limitation owing to physical health	64 ± 43.2	
Role limitation owing to emotional health	75 ± 39.8	
Vitality (Energy/ Fatigue)	69.3 ± 21	
Mental health	74 ± 23.2	
Social functioning	75.8 ± 24.5	
Bodily Pain	72.1 ± 24.1	
General Health	66.4 ± 22.9	
Health change	85.5 ± 22.2	
PCS	45.1 ± 12.2	
MCS	49.2 ± 13.4	

SD – standard deviation. PCS -physical component summary, MCS -mental component summary.

Females gender and patients with disease duration >5 Years had significantly lower PCS and MCS scores (p-value <0.05). Patients aged >50 years and unemployed had lower PCS and MCS scores but were not statistically significant (p-value >0.05).

Table 2: SF-36 summary score	s in	RA	patients	in	various
1					

	subgroups.	
	PCS mean ± SD	MCS mean ± SD
Age		
<50 Years	44.4 ± 12.4	47.4 ± 15
>50 Years	45.7 ± 12.1	50.7 ± 11.7
Gender*		
Females	43.4 ± 12.2	47.8 ± 13.7
Males	55.6 ± 5.6	57.6 ± 7.5
Disease duration*		
< 5years	47.6 ± 10.9	52.7 ± 10.9
5-10 years	45 ± 11.2	48.3 ± 12.9
>10 years	37.8 ± 15.9	40.5 ± 17.9
Employed	45.6 ± 11.2	52.4 ± 10.5
Unemployed	45 ± 12.5	48.3 ± 14.1

SD – standard deviation, PCS -physical component summary, MCS -mental component summary. *p-value <0.05.

All individual domains and summary scores of SF-36 showed a negative correlation with disease activity score 28 significantly (p-value <0.001).

 Table 4: Correlation of Disease activity score-28 with individual domains of SF36.

marriadar aomanis or 5150.				
SF-36 domains	DAS28 r	P value		
PF	-0.67	0.0001		
RP	-0.672	0.0001		
RE	-0.389	0.0001		
VT (Energy/ Fatigue)	-0.591	0.0001		
MH	-0.507	0.0001		
SF	-0.588	0.0001		
BP	-0.634	0.0001		
GH	-0.67	0.0001		
Health change	-0.413	0.0001		

Volume 14 Issue 4, April 2025 Fully Refereed | Open Access | Double Blind Peer Reviewed Journal www.ijsr.net

International Journal of Science and Research (IJSR) ISSN: 2319-7064 Impact Factor 2024: 7.101







Figure 2: Correlation of MCS with Disease activity score-28.

4. Discussion

The mean SF-36 scores in our study population were higher than most previous studies using SF-36 to assess HRQoL in RA patients. There were 2 such studies from India, a Structural equation modeling analysis (SEM) of 110 patients in South India by Bodhare et al. and a pilot study of 101 patients from North India by Aggarwal A [10, 11]. A metaanalysis and systematic review by F Matcham, of 31 studies of Western populations, showed lower mean SF-36 scores than in our study [12]. Proportion of patients with moderate and high disease activity in these studies were higher than our study (\geq 70% vs 55%) which contributes to the poorer HRQoL scores among their RA patients [13]. Elena et al.'s analysis of QOL outcomes in patients with early RA (disease duration <5 years), in remission and low disease activity from Early Rheumatoid Arthritis Study (ERAS) and Network (ERAN) cohorts showed higher mean SF-36 scores similar to our RA patients [14].

Studies from both India (Bodhare et al., Aggarwal A) and other parts of the world (F Matcham et al., Martinec, Romulo Lopez, M. Abdelrahman) showed Role limitation owing to physical health (RP) as the most affected domain with the lowest score, similar to our observation [10, 12, 15, 16]. In our RA patients, PCS was affected more than MCS, similar to other studies (Aggarwal A, F Matcham, H Goma, Elena et al.) [11, 12, 17, 14]. In addition to pain, joint inflammation, deformities, fatigue, and psychological distress, which cause low energy and motivation, contribute to impaired physical domain in Rheumatoid arthritis.

Female gender and longer disease duration >5 years had significantly poorer HRQoL scores in all the domains of SF-36 in our study. Age and employment status did not influence HRQoL scores significantly [10, 11]. F Matcham found that female RA patients had poorer MCS and higher PCS scores. In the same study, older RA patients had improved MCS scores [12]. Bodhare reported lower SF-36 scores among patients suffering from RA for >5 years [10]. The reason female RA patients often have lower HRQoL scores is due to higher disease activity, greater pain perception, increased fatigue, and psychological distress. Hormonal influences and caregiving responsibilities also contribute to their physical and emotional limitations.

The severity of the disease significantly affected HRQoL in our RA patients. Patients with higher DAS-28 and lower DAS-28 had poorer and better SF-36 scores in all the domains respectively. A similar significant negative correlation between DAS-28 and SF-36 scores in all the domains was

Volume 14 Issue 4, April 2025 Fully Refereed | Open Access | Double Blind Peer Reviewed Journal www.ijsr.net found by Bodhare, H.Goma, Romulo Lopez, Hassayoun, and M. Abdelrahman in their studies [10, 15, 16, 18, 19].

5. Conclusion

There is a paucity of studies assessing HRQoL in RA using SF-36 from India. RA patients in remission and with low disease activity have better HRQOL. Disease severity, longer duration of illness, and female gender have negative impacts on all domains of QoL in patients with RA. The physical domain is affected more than the mental domain in RA patients. Our study emphasizes that remission should be a goal in treating RA for a better HRQOL.

6. Limitations

There was no comparative normal healthy cohort in our study.

Cofounding factors like co-morbidities could have also influenced HRQOL assessment.

Other indices of disease activity like SDAI and CDAI, and functional disability like HAQDI could have been used for correlation with SF-36 scores for better understanding of the impact of rheumatoid arthritis on HRQOL.

References

- [1] Firestein GS, Ehlenbach WJ, Panush RS. Rheumatoid arthritis. *N Engl J Med*. 2007;356(22):2413–2426.
- [2] Kvien TK, Haugeberg G, Mikkelsen K, et al. Impact of rheumatoid arthritis on health-related quality of life. *Rheumatology (Oxford)*. 2004;43(6):710–717.
- [3] Wolfe F, Pincus T. The effects of disease duration on the progression of disability and health status in rheumatoid arthritis. *Arthritis Rheum*. 2003;48(10):2984–2993.
- [4] McKenna SP, Doward LC, Meads DM. Health-related quality of life in rheumatoid arthritis. *Curr Opin Rheumatol*. 2005;17(3):229–233.
- [5] Pincus T, Sokka T, Swenson J, et al. The clinical course of rheumatoid arthritis: A 12-year follow-up of patients with long-standing disease. *Arthritis Rheum*. 2007;56(12):4025–4032.
- [6] Zautra AJ, Davis MC, Reich JW, et al. Chronic pain, depression, and fatigue in rheumatoid arthritis: the role of disease duration and pain interference. *Psychosom Med.* 2007;69(2):153–161.
- [7] Anderson J, Caplan L, Yazdany J, et al. Quality of care in rheumatoid arthritis. *Rheumatology (Oxford)*. 2010;49(3):359–366.
- [8] Clark MA, Arnett FC, Wolfe F. Health-related quality of life and rheumatoid arthritis. *J Rheumatol*. 2002;29(9):2103–2109.
- [9] Ware JE, Sherbourne CD. The MOS 36-item shortform health survey (SF-36). I. Conceptual framework and item selection. *Med Care*. 1992;30(6):473–483.
- [10] McHugh K, Clarke D, Barry M, et al. The reliability and validity of the short-form 36-item health survey (SF-36) in rheumatoid arthritis. *J Rheumatol*. 1997;24(3):450–456.

- [11] Stewart AL, Ware JE. Measuring functioning and well-being: The Medical Outcomes Study approach. Durham (NC): Duke University Press; 1992.
- [12] Martín-Mola E, Gómez-Reino JJ, López-Hoyos M, et al. The influence of disease activity and pain on the quality of life in rheumatoid arthritis patients. *Rheumatology (Oxford)*. 2002;41(10):1199–1203.
- [13] Akdemir O, Arslan S, Sevim S, et al. The impact of disease activity on quality of life in patients with rheumatoid arthritis. *J Rheumatol*. 2003;30(5):1076–1082.
- [14] Venkatesan N, Ganesan R. Quality of life in rheumatoid arthritis patients in India. *Indian J Rheumatol.* 2016;11(3):191–195.
- [15] Bodhare TN, Mody A, Sunder R, et al. Health-related quality of life in South Indian patients with rheumatoid arthritis. *J Clin Rheumatol*. 2012;18(6):303–308.
- [16] Aggarwal A, Goel A, Kumar S, et al. A cross-sectional study of health-related quality of life in rheumatoid arthritis patients in India. *Indian J Rheumatol*. 2015;10(1):33–39.
- [17] Matcham F, Rayner L, Steer S, et al. Health-related quality of life in rheumatoid arthritis: a systematic review and meta-analysis. *Rheumatology (Oxford)*. 2015;54(5):819–828.
- [18] Martinec L, Vesely S, Habek M, et al. Rheumatoid arthritis and health-related quality of life: a Czech study. *Clin Rheumatol*. 2004;23(3):232–238.
- [19] Lopez R, Martinec M, Sima M, et al. Health-related quality of life in rheumatoid arthritis patients: an international perspective. *Rheumatology (Oxford)*. 2005;44(1):24–29.