ORIGINAL ARTICLE

Barriers to Timely Rheumatologic Care for Rheumatoid Arthritis: A Real-World Questionnaire-based Study from Karnataka Chapter of Indian Rheumatology Association (KRA)

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Abstract

Introduction: To assess referral timelines to rheumatologists in Karnataka, India, identify factors linked to delays, and to examine their impact on disease activity, functional disability, and economic burden.

Materials and methods: A multicenter, cross-sectional, observational questionnaire-based study was conducted across 17 rheumatology centers in Karnataka, India (June, 2023–July, 2024). Disease activity (DAS28, CDAI), disability (HAQ-DI), and healthcare expenditure prior to referral and during the past 1 year were analyzed in relation to self-reported referral time, categorized as early (≤3 months from symptom onset) and late (>24 months). Utilization of healthcare schemes available in Karnataka was captured.

Results: Among 2,141 participants with RA, the median referral time to a rheumatologist was 18 (6–36) months, early referral (≤3 months) in 17% (*n* = 365), and late referral (>24 months) in 31% (*n* = 662). Older age [AOR = 1.01 (1.005–1.02)], being married [AOR = 1.48 (1.03–2.12)], resident of non-Bengaluru regions [AOR = 2.26 (1.60–3.19)], academic treating facility [AOR = 2.32 (1.68–3.18)], and longer duration of illness >120 months [AOR =2.84 (2.14–3.76)] had higher odds of late referrals. This group had significantly higher expenditure prior to referral [β = 3.57 (3.05–4.19)], higher total annual medical expenditure [β = 1.20 (1.09–1.32)], and catastrophic expenditure [β = 1.56 (1.22–2.01)]. 52 % (*n* = 1120) of participants reported out-of-pocket healthcare expenditure.

Conclusion: Delayed referral to a rheumatologist was associated with increased disability and financial strain, including a significantly higher risk of catastrophic health expenditure.

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Introduction

Rheumatoid arthritis (RA) is a chronic, systemic inflammatory disorder that, if not treated promptly with disease-modifying antirheumatic drugs (DMARDs), can lead to progressive joint deformities and long-term disability. Early diagnosis and prompt institution of DMARDs' is the global standard of care, enabling remission or low disease activity through dynamic adjustments to therapeutic protocols.[1–3] Improved outcomes are increasingly feasible with the availability of biosimilars and generics such as tofacitinib, particularly in resource-limited countries like India.[4–6] These advances have expanded access to advanced therapeutic options, potentially transforming the therapeutic landscape for patients with RA.

India's healthcare system largely relies on direct and often informal referral pathways, with limited integration of a structured, tiered referral model. Early referral to a specialist at the primary care level hinges on prompt recognition of symptoms and the accessibility of specialized care. However, limited awareness of RA among both primary care providers and the general public significantly hampers

early identification and referral, thereby missing the critical "window of opportunity" for initiating DMARDs.[7] Strengthening early referral to specialist care and adopting a treat-to-target approach will eventually slow disease progression, reduce long-term disability, and ultimately alleviate the societal burden of RA by lowering healthcare expenditures and enhancing patient productivity.

Governmental national health schemes, including Ayushman Bharat–Pradhan Mantri Jan Arogya Yojana (AB-PMJAY), Rastriya Arogya Nidhi, and the Employees' State Insurance Scheme (ESIS), predominantly cater to acute or catastrophic health events. Skewed allocation of governmental healthcare resources with minimal emphasis on chronic diseases, which require predominantly outpatient care, imposes a substantial financial burden for patients, especially those with chronic musculoskeletal diseases like RA, where poorly controlled results in a higher disability burden.[8,9] Further, the reluctance of private insurance policies to include RA, the majority of expenses are borne out-of-pocket, leading to significant economic strain on individuals and their families managing this lifelong disease.

The global burden of RA has risen steadily over recent decades and is projected to continue increasing.[10] This underscores the critical importance of early diagnosis and timely initiation of treatment to mitigate long-term disability and reduce the associated economic burden. We conducted this study to assess the referral time to rheumatologists among patients with RA in Karnataka, India, and to evaluate its impact on disease activity, functional disability, and associated economic burden.

Materials and Methods

Seventeen rheumatology centers conducted a cross-sectional questionnaire study among patients with RA residing in Karnataka, India, between June 2023 and July 2024. We extracted data from the Karnataka Rheumatoid Arthritis Economic Burden study (KRAeb) to assess the time taken for referral to rheumatologists, healthcare-related expenses incurred prior to referral and the current disease activity. Distribution of participating rheumatologists in the state of Karnataka was mapped and divided into Bengaluru (11 centers) versus non-Bengaluru (7 centers) and into academic and nonacademic practice settings.

Adult patients with RA diagnosed as per the ACR classification criteria, with a follow-up for at least 1 year at respective centers, were included.[11] Patients with alternative rheumatological diagnoses were excluded. Demographic data, socioeconomic status as per the Kuppuswamy scale (2022), and self-reported utilization of healthcare schemes were captured using a structured questionnaire.[12] A glossary was created, and an instructional video was generated on the steps to capture the data. The questionnaire was administered by the nurse or research coordinator at the respective centers and verified by the rheumatologist. Patients' personal and hospital medical records were accessed to confirm clinical and laboratory information and the comorbidities. Disease activity was measured by DAS28 and CDAI, and functional status was measured using the Indian version of HAQ-DI.[13–15]

Time taken for referral was categorized as early and late referrals. Early referral was defined as those within 3 months of the onset of articular symptoms (group I), while late referral was ≥ 24 months (group III). Disease duration between 4 and 24 months was categorized as group II. Distribution of self-declared expenditure prior to referral was analyzed in reference to direct medical and nonmedical as well as catastrophic healthcare expenditure (CHE), defined as >10% of annual household income. Further, current disease activity and disability were analyzed in relation to the time taken for referral.[16,17]

All participants provided written consent for participation, and all centers received ethics approval. We followed STROBE guidelines for reporting.[18]

Statistical Methods

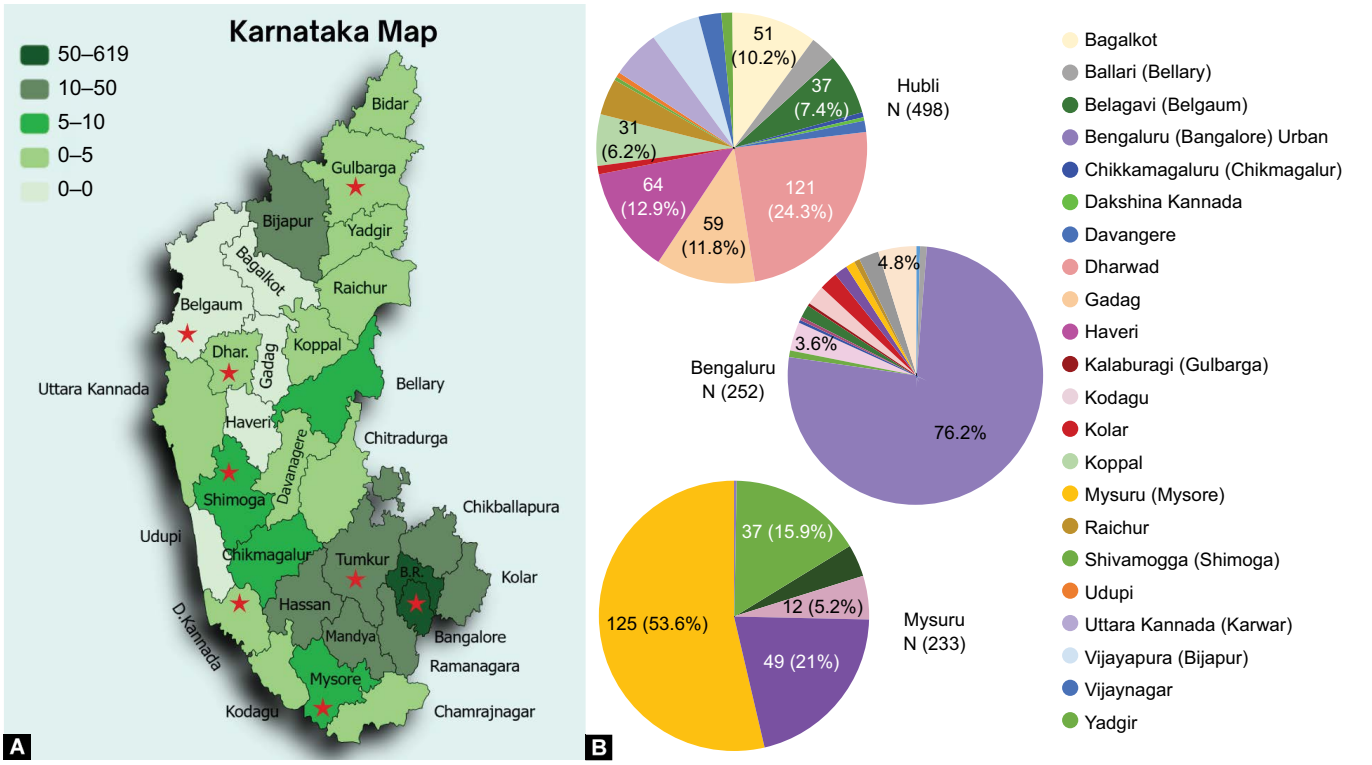
Data analysis was performed using STATA version 15.0 and SPSS 29.0 software. The distribution of continuous variables was assessed for normality by Q-Q plot. Non-normal data were log-transformed prior to analysis. Descriptive statistics were reported as mean with standard deviation for the normally distributed continuous variables, and as median with interquartile range for non-normally distributed data. All the costs were reported as median with an interquartile range. Accounting for the variability across multiple centers, mixed-effect multinomial regression analysis was performed to assess the factors associated with delayed referral; the study centers were treated as random effects in the model. Variables with a p-value < 0.05 in the univariate analysis were included in the multivariable regression model. Multiple linear regression analysis was performed to assess the impact of late and early referral on healthcare expenditure, adjusted for age, duration of illness, and SES. A p-value < 0.05 was considered statistically significant for all analyses. Missing data accounted for less than 3% of the dataset; hence, a complete-case analysis approach was used.

Results

A total of 2,235 participants with RA were recruited. Of them, we included 2,141 patients after excluding those with missing and inconsistent data. The mean age was 50.9 ± 12 years, and the gender ratio was M: F::11:89. Median time for referral to rheumatologist after disease onset was 18 (6–36) months. While an early referral was noted in 17% (n = 365), delayed referral of more than 2 years was noted in 31% (n = 662) of patients with RA. On average, patients had 2 (1–4) medical consultations before referral to a rheumatologist. An overview of the cohort is presented in Supplementary Table S1. Of the 17 participant centers, 11 were located in the metro city, Bengaluru, and 5 belonged to medical academic institutions. Figures 1A and B represent the referral density across districts in Karnataka and the diversity in referral patterns in three representative centers located in Hubli, Bengaluru, and Mysore. Nearly 43% of patients with rheumatoid arthritis sought specialist care outside their home district, indicating that access to rheumatology services often required interdistrict travel.

The variability in the proportion of early and late referrals was significantly different across study centers (p < 0.01). After accounting for the random effect of centers, results of unadjusted and adjusted analyses of the factors associated with delayed referral are presented in Tables 1 to 3, respectively. In the unadjusted analysis, late referrals were significantly associated with older age, marital status, residence in rural areas, treatment at academic centers, treatment sought outside Bengaluru, longer disease duration (61–120 months), and higher disease activity. In the adjusted analysis, among the sociodemographic parameters older age [AOR = 1.01 (1.005–1.02)], marital status [AOR = 1.48 (1.03–2.12)], patients seeking treatment in non-Bengaluru regions [AOR = 2.26 (1.60–3.19)], treating facilities being an academic center [AOR = 2.32 (1.68–3.18)] and longer duration of illness {61–120 months [AOR = 1.92 (1.22–3.01)], >120 months [AOR = 2.84 (2.14–3.76)]} had higher odds of being associated with late referrals (>24 months). Patients with late referrals had higher odds of disability [AOR = 8.004 (2.88–22.1)], and patients with multimorbidity were less likely to be associated with late referrals [AOR = 0.67 (0.51–0.88)].

In the unadjusted analysis, patients seeking treatment from non-Bengaluru regions



Figs 1A and B: (A) Geographic distribution of patients by district in Karnataka; (B) Pie charts showing the proportion of patients from neighboring districts at three major representative centers, accounting for 46% of the total cohort (In Fig. 1A, varying color intensity indicates the relative size of the patient population across different districts in Karnataka. In Fig. 1B, each pie chart represents a different center, as shown in the legend. ✧Districts in which rheumatologists are available.)

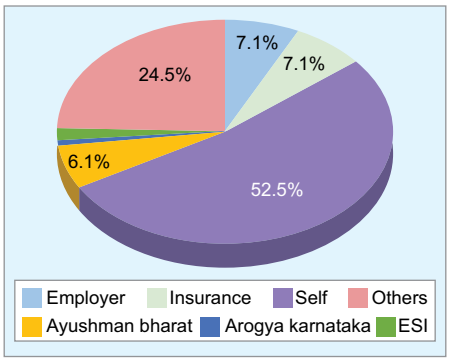


Fig. 2: Sources of healthcare financing among participants [Healthcare financing: self/out-of-pocket, 1120 (52.5%); employer, 152 (7.1%); insurance, 152 (7.1%); Ayushman Bharat, 131 (6.1%); Arogya Karnataka, 20 (1.0%); Employees' State Insurance (ESI), 35 (1.6%); others, 522 (24.5%; borrowing, sale of assets, or support from relatives]

belonging to middle socioeconomic status and having lower levels of education, patients with higher disease activity [DAS >5.1] and higher disability (HAQ-DI 2–3) were significantly less likely to have been associated with early referrals. Adjusted analyses showed that patients treated at academic centers [AOR = 0.41 (0.29–0.59)] and those with higher disability (HAQ-DI 2–3) [AOR = 0.56 (0.40–0.78)] had lower odds of association with early referral.

Regarding expenditure parameters, adjusted for age, duration of illness, and SES, patients with late referral had significantly higher cumulative expenditure prior to referral to rheumatologists [β = 3.57 (3.05–4.19)]. The late referral group also incurred higher total annual medical expenditure [β = 1.20 (1.09, 1.32)], both in the medical [β = 1.46 (1.31–1.63)] and nonmedical [β = 1.42 (1.26–1.58)] components. Whereas patients with early referrals had significantly lower costs associated with prereferral [β = 0.37 (0.29–0.46)] and nonmedical expenditure [β = 0.64 (0.56–0.72)] (Table 2). In 52.5% of patients (n = 1,120), healthcare expenses were primarily borne through out-of-pocket payments, while 24.5% (n = 522) reported having to take loans or sell assets to finance their treatment, as illustrated in Figure 2.

Discussion

This study explored the associations and consequences of the time taken for referral to rheumatologists in patients diagnosed with RA. The categories for referral time were chosen based on clinical meaningfulness: early referral (<3 months), representing the critical window for initiating DMARDs; and late referral (≥24 months), which is the timeframe associated with the development of radiographically detectable erosive changes. We found that the median time to referral to rheumatologists was 1.5 years, and almost one-third of patients took longer than 2 years for their first visit to a rheumatologist, with resultant higher disability and healthcare-related expenditure.

The effects of delayed referral have been documented in multiple conditions, including chronic renal failure, trauma, acute myocardial infarction, maternity care, and cancer, demonstrating similar challenges and negative consequences.[19–23] In oncology, delay has been linked to advanced-stage diagnoses and higher mortality.[23] Similarly, in cardiology, delayed referrals result in increased hospitalization rates for heart failure; in nephrology, late dialysis initiation and poorer outcomes.[24,25] Prentice et al. demonstrated a clear link between delayed referral and higher mortality in the Veterans Affairs healthcare system in the United States.[26] These findings underscore the universal impact of delayed referrals across specialties and reinforce the need for early intervention in RA to prevent irreversible joint damage and disability.

Stack et al. reported that delays in referral for patients with RA in the United Kingdom occurred at all levels along the pathway for assessment by a rheumatologist.[27] This

Table 1: Unadjusted mixed-effects regression for factors influencing time to referral in rheumatoid arthritis

Variables	*Early (<3 months) n = 365 (17%)*	*4–24 months[#] n = 1,099 (51%)*	*Late (> 24 months) n = 662 (31%)*	*Early referral unadjusted odds ratio*	*Late referral unadjusted odds ratio*
Sociodemographic parameters					
Age	51 (48–60)	50 (42–59)	52 (45–60)	0.99 (0.98–1.008)	1.01 (1.004–1.02)
Gender					
Male	44 (18.4)	130 (54.4)	65 (27.2)	1	1
Female	321 (17.0)	969 (51.4)	597 (31.6)	1.03 (0.71–1.50)	1.30 (0.94–1.80)
Non-Bengaluru	185 (13.2)	719 (51.1)	502 (35.7)	0.74 (0.58–0.94)	2.26 (1.74–2.94)
Bengaluru*	180 (25.0)	380 (52.8)	160 (22.2)	1	1
Academic	271 (29.6)	430 (47.0)	214 (23.4)	0.31 (0.23–0.42)	1.90 (1.48–2.45)
Nonacademic*	94 (7.8)	669 (55.2)	448 (37.0)	1	1
Residence					
Rural	126 (13.8)	458 (50.3)	326 (35.8)	0.85 (0.69–1.05)	1.57 (1.21–2.03)
Urban and metro*	239 (19.7)	640 (52.7)	336 (27.7)	1	1
Marital status					
Married	297 (15.7)	995 (52.7)	595 (31.5)	0.85 (0.61–1.19)	1.73 (1.23–2.44)
Unmarried*	68 (28.6)	103 (43.3)	67 (28.2)	1	1
SES					
Upper class*	150 (22.4)	340 (50.8)	179 (27.0)	1	1
Middle class	93 (13.0)	379 (53.1)	242 (33.9)	0.72 (0.55–0.95)	1.22 (0.98–1.51)
Lower class	122 (16.4)	380 (51.1)	241 (32.4)	0.78 (0.61–1.02)	1.01 (0.73–1.11)
Patient education					
High*	85 (24.7)	173 (50.3)	86 (25.0)	1	1
Middle	187 (15.8)	621 (52.5)	374 (31.6)	0.72 (0.55–0.95)	1.20 (0.98–1.51)
Low	91 (15.5)	298 (50.7)	199 (33.8)	0.78 (0.61–1.02)	0.89 (0.72–1.11)
Financially dependent	256 (16.2)	844 (53.3)	484 (30.6)	1.26 (0.96–1.65)	1.10 (0.87–1.38)
Duration of follow-up					
<60 months*	241 (15.0)	912 (56.7)	455 (28.3)	1	1
61–120 months	77 (21.3)	125 (34.5)	160 (44.2)	1.92 (1.39–2.66)	2.29 (1.75–2.66)
>120 months	46 (30.1)	62 (40.5)	45 (29.4)	2.01 (1.31–3.06)	1.02 (0.67–3.06)
Disease-related parameters					
DAS28					
>5.1	39 (12.8)	149 (49.0)	116 (38.2)	0.71 (0.54–0.94)	1.23 (0.84–1.82)
<2.6 to ≤5.1*	299 (17.2)	923 (53.1)	515 (29.6)	1	1
CDAI					
>22	37 (19.6)	95 (50.3)	57 (30.2)	1.007 (0.66–1.52)	1.22 (0.85–1.75)
>2.8 to ≤22*	323 (16.8)	1002 (52.0)	603 (31.3)	1	1
HAQ-DI					
2–3	4 (1.7)	136 (56.9)	99 (41.4)	0.53 (0.39–0.72)	8.49 (3.09–23.2)
0 to <2*	361 (19.1)	963 (51.0)	563 (29.8)	1	1
Comorbidity					
No comorbidity*	175 (15.7)	572 (51.3)	369 (33.1)	1	1
Any one comorbidity	182 (18.7)	513 (52.6)	280 (28.7)	1.08 (0.59–1.24)	0.99 (0.79–1.25)
Multimorbidity	86 (20.4)	234 (55.6)	101 (24.0)	1.20 (0.89–1.62)	0.82 (0.66–0.96)

Reported as an unadjusted odds ratio with 95% confidence interval; *Reference category for sociodemographic and disease-related parameters; [#]Reference category for time taken for referral (4–24 months). OR, odds ratio; CDAI, clinical disease activity index; CI, confidence interval; DAS28, disease activity score 28; HAQ-DI, health assessment questionnaire disability index; SES, socioeconomic status

study noted that only 20% of patients were evaluated by a rheumatologist within the first 3 months of symptom onset. Notably, delays attributable to general practitioners were prominent and were influenced by various factors, including patient ethnicity. Another study from Poland by Raciborski et al. identified that delayed referral and diagnosis of rheumatologic diseases were influenced by both limited patient awareness and the delay in the referral pathway.[28] The study noted that most patients self-medicated before seeing a doctor, and only 34% of the patients seeking medical attention were referred to a rheumatologist. We also observed that 82%

Table 2: Unadjusted multiple linear regression assessing the impact of time taken for referral on expenditure

Variables	*Early referral (≤3 months), n = 365 (17%)*	*4–24 months#, n = 1099 (51%)*	*Late referral (> 24 months) n = 662 (31%)*	*Early referral β (95% CI)*	*Late referral β (95% CI)*
Prereferral expenditure	10,000 (3,000–50,000)	25,000 (10,000–60,700)	100,000 (45,500–2,16,087)	0.31 (0.25–0.39)	4.64 (4.02–5.37)
Total annual expenditure					
Medical	27,900 (18,214–43,820)	31,960 (21,200–43,600)	34,200 (24,550–47,695)	0.90 (0.81–1.00)	1.35 (1.24–1.47)
Nonmedical	24,800 (16,440–24,800)	26,724 (18,200–38,420)	28,860 (20,400–42,400)	0.96 (0.86–1.08)	1.39 (1.27–1.53)
	2000 (800–3400)	3600 (1200–6400)	4400 (1600–6800)	0.64 (0.57–0.73)	1.31 (1.18–1.45)
CHE ≥ 10%	144 (14.1)	355 (34.8)	521 (51.1)	0.88 (0.48–0.92)	1.56 (1.22–2.01)

#Reference category. CHE, catastrophic healthcare expenditure; CI, confidence interval

Table 3: Adjusted mixed-effects multinomial regression analysis of factors associated with early and late referral in patients with RA

Variables	*Early referral ≤3 months, n = 365 (17%) AOR (95% CI)*	*Late referral >24 months, n = 662 (31%) AOR (95% CI)*
Sociodemographic parameters		
Age	0.99 (0.98–1.002)	1.01 (1.005–1.02)
Non-Bengaluru	0.85 (0.62–1.15)	2.26 (1.60–3.19)
Bengaluru*	1	1
Academic	0.41 (0.29–0.59)	2.32 (1.68–3.18)
Nonacademic*	1	1
Area of residence	1.02 (0.74–1.41)	0.96 (0.75–1.22)
Marital status	0.98 (0.73–1.31)	1.48 (1.03–2.12)
Duration of follow-up		
<60 months*	1	1
61–120 months	1.71 (1.07–2.75)	1.92 (1.22–3.01)
>120 months	1.74 (1.23–2.47)	2.84 (2.14–3.76)
SES		
Upper class*	1	1
Middle class	0.79 (0.56–1.13)	0.98 (0.73–1.31)
Lower class	0.81 (0.56–1.16)	0.86 (0.63–1.18)
Patient education		
High	1	1
Middle	1.10 (0.72–1.70)	0.85 (0.58–1.26)
Low	1.09 (0.79–1.50)	1.13 (0.89–1.45)
Financially dependent	1.06 (0.87–1.41)	1.29 (0.97–1.73)
Disease-related parameters		
DAS28		
>5.1	0.98 (0.65–1.49)	0.86 (0.64–1.16)
<2.6 to ≤5.1*	1	1
HAQ-DI		
0 to <2*	1	1
2–3	0.56 (0.40–0.78)	8.004 (2.88–22.1)
No comorbidity*	1	1
Any one comorbidity	1.07 (0.93–1.22)	0.81 (0.69–0.96)
Multimorbidity	1.14 (0.85–1.54)	0.67 (0.51–0.88)

Reported as adjusted odds ratio with 95% confidence interval; *Reference category. AOR, adjusted odds ratio; CI, confidence interval; DAS28, disease activity score 28; HAQ-DI, health assessment questionnaire disability index; SES, socioeconomic status

of patients had missed the critical window for early initiation of DMARDs by the time of their referral to rheumatologists.

Educational attainment has consistently been linked to health literacy, influencing a patient's ability to recognize symptoms, seek appropriate care, and navigate health systems effectively.[29] Lower educational levels may contribute to underestimation and misinterpretation of symptoms or reliance on traditional remedies before seeking medical evaluation. This may result in missing the window of opportunity for initiation of DMARDs, as demonstrated in our study. In a systematic review exploring the impact of health literacy on outcomes in patients with musculoskeletal diseases, low health literacy was linked to greater pain and limitations in physical functioning.[30] Interventions aimed at improving public awareness and promoting health literacy have the potential to significantly reduce the referral delays, facilitate early diagnosis, and improve disease outcomes in patients with RA.

In a questionnaire-based study from the Netherlands evaluating the impact of socioeconomic status, utilization of healthcare

services, and course of RA, patients with lower SES had worse disease activity, physical health, mental health, and quality of life than patients with higher SES. The healthcare utilization rates of allied healthcare were also lower in patients belonging to lower SES. We also report results on the same trend, showing late referral for patients belonging to lower SES and resultant higher disease activity and disability. The Korean Observational Study Network for Arthritis (KORONA) database, which included more than 5,000 patients with RA, demonstrated 34% lower utilization of biologics among patients with lower SES despite higher disease activity.[31] These findings reflect underlying social disparities that indirectly contribute to delays in treatment initiation and limited access to care, ultimately impacting the overall management and outcomes of patients with RA.

A study from Texas, USA, reported that a DAS28 ESR increase of 0.02 with each year of delayed treatment was associated with an annual increase in Sharp score and HAQ score.[32] Our study also highlights that delay in referrals results in higher disability, even though the disease activity could be somewhat controlled, but at a higher expenditure.

Distance from the nearest rheumatologist remains a significant barrier to timely specialist care. In our study, the rheumatologists were predominantly concentrated in the major urban centers in the Karnataka state, leading to geographic disparities in access. Patient density varied across regions and appeared to correlate with the availability of specialist services, suggesting that limited access to rheumatology care may contribute to the uneven distribution of patients. Approximately half of the patients in our cohort traveled across district boundaries to access specialist care, incurring additional financial burdens and physical inconvenience, thereby amplifying both the direct nonmedical as well as indirect costs associated with rheumatology consultations. In a study from Canada, proximity and density of rheumatologists, and remote patient residence were associated with longer time to consultations.[33]

Healthcare facility types vary widely across regions globally. In India, the healthcare system comprises a diverse mix of public and private provider models, including academic institutions, corporate multispecialty hospitals, and stand-alone clinics. There is a skewed representation of rheumatologists across districts, being concentrated in larger metro cities. Our study found that patients referred early were more likely to present to private healthcare settings, whereas those with delayed referrals sought care in academic centers. Five academic institutions that contributed data to the current study are nongovernment institutions, as none of the public health delivery setups have rheumatology facilities in Karnataka. On average, patients had approximately 2 to 4 medical consultations before being referred to a rheumatologist, and those with late referral were more likely to have experienced CHE.

In India, although national health services provide support for healthcare, the focus remains primarily on acute illnesses, surgical interventions, and catastrophic health events, with limited attention to chronic conditions. Budget allocations for noncommunicable diseases are largely directed towards cardiovascular diseases, diabetes, and cancer, resulting in underfunding of autoimmune conditions such as RA. Despite the availability of generics and biosimilars, the limited allocation of resources for rheumatic diseases continues to hinder access to DMARDs and biologics.[34] Unlike several other chronic diseases, RA lacks a dedicated public health program to ensure subsidized access to therapies, compelling patients, particularly those from rural and socioeconomically disadvantaged backgrounds, to rely on personal finances, thereby deepening existing health disparities. Our study found that over half of the patients bore healthcare expenses out-of-pocket, and a high incidence of CHE in those with late referrals.

To the best of our knowledge, this is the first multicenter study addressing the barriers to early referral of patients with RA to rheumatologists and their impact on disease status and financial health in real-life settings. Our report is strengthened by including patients across the entire state of Karnataka from varied socioeconomic strata across different healthcare delivery setups. However, we must acknowledge the inherent bias of the cross-sectional nature of this study, as we may have overestimated the expenditures incurred by the patients, which were dependent on recall. Nonuniformity in expenditures pertaining to travel, food amenities, and accessibility of generic medications may have affected the results. Nonetheless, this study highlights the need for strengthening the need for early referral, together with expanded health care support for chronic diseases like RA.

Conclusion

This study provides valuable insights into barriers to early referral of patients with RA to rheumatologists and highlights the clinical and economic consequences of delayed referral. The median referral time was 1.5 years, and only 17% of patients consulted a rheumatologist within 3 months of articular symptoms, while nearly one-third were referred beyond 2 years. Late referral was associated with significantly higher prereferral as well as catastrophic healthcare expenditure in nearly half of the affected patients. Additionally, patients with delayed referrals exhibited greater levels of disability. Factors contributing to delayed referral included older age, residence in nonmetropolitan areas, middle category of socioeconomic status, and limited educational attainment. Nearly half of the patients were required to travel outside their home district to access specialist care, and a similar proportion relied on out-of-pocket payments for medical care, reflecting limited access to specialists, health insurance, and government-sponsored healthcare schemes. These findings underscore the urgent need for systemic interventions to promote early diagnosis and equitable access to specialist care for patients with RA.

Ethics Approval

Ethics approval was obtained from the respective ethics committees: Institutional Ethics Committee, St. John's Medical College and Hospital. IEC Ref No.-57/2023 dated July 08, 2023.

Author Contributions

Conception and design of the study: VS, SS, and KM; analysis and interpretation of data: VS, SV, SS, SR, and PJ; data acquisition, drafting and critical revision of the manuscript, approval of the final version, and accountability for all aspects of the work: All authors.

Disclosure Statement

Part of this manuscript has been presented at APLAR 2024, IRACON 2023 and 2024.

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Data Availability Statement

The datasets of the current study are available from the corresponding author upon reasonable request.

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Table S1: Overview of cohort (*N* = 2,144)

Variables	*Value n (%)*
Age in years (Mean ± SD)	50.9 ± 12
Gender	
Male	54 (10.3)
Female	468 (89.7)
Location of medical facility	
Bengaluru	728 (34.0)
Non-Bengaluru	1413 (66.0)
Type of treating facility	
Academic	921 (43.0)
Nonacademic	1220 (57.0)
Residence location	
Rural	914 (43.0)
Urban and metro	1229 (57.0)
Marital status	
Married	1899 (88.0)
Unmarried	241 (11.0)
SES	
Upper class (1, 2)	676 (32.0)
Middle class (3)	718 (34.0)
Lower class (4, 5)	750 (35.0)
Patient education	
Higher level-3 (7, 6)	348 (16.0)
Middle level-2 (5, 4, 3)	1188 (55.0)
Primary level-1 (2, 1)	594 (28.0)
Patient occupation	
Higher level (7, 8, 9, 10)	174 (8.0)
Middle level (4, 5, 6)	232 (11.0)
Lower level (1, 2, 3)	1711 (80.0)
Time taken for referral	
≤ 3 months	365 (17.0)
4–24 months	1099 (51.0)
> 24 months	662 (31.0)
Total duration of symptoms (months)	60 (36–120)
DAS28 (median, IQR)	3.7 (2.8–4.6)
CDAI (median, IQR)	9 (4–15)
HAQ-DI (median, IQR)	0.8 (0.2–1.5)
Comorbidity	
None	1120 (52.0)
Any one comorbidity	559 (26.0)
Multimorbidity	424 (20.0)

CDAI, clinical disease activity index; DAS28, disease activity score 28; HAQ-DI, health assessment questionnaire disability index; IQR, interquartile range; SD, standard deviation; SES, socioeconomic status.