INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

CORRELATION BETWEEN PSYCHOLOGICAL FACTORS AND SELF-MANAGEMENT ABILITIES AMONG PATIENTS WITH RHEUMATOID ARTHRITIS

Original Research

Muhammad Islam[1]*, Matiullah[2], Mumtaz Ali[3], Hamza Khan[4], Uzair Ahmed[5]

[1]Principal, BSN, MSN, Florence Institute of Medical Sciences and Nursing, Alladand, Malakand, Pakistan.

[2]Clinical Instructor, BSN, Florence Institute of Medical Sciences and Nursing, Alladand, Malakand, Pakistan.

[3]Registered Nurse, Post RN BSN, MPH, Category B Hospital, Dargai, Malakand, Pakistan.

[4]BSN, (Rn pak &KSA) clinical instructor Florence Institute of medical sciences and nursing alladand malakand, Pakistan.

[5]BSN, DPH, nursing instructor Florence Institute of medical sciences and nursing alladand Malakand, Pakistan.

Corresponding Author: Muhammad Islam, Principal, BSN, MSN, Florence Institute of Medical Sciences and Nursing, Alladand, Malakand, Pakistan, islamdurrani3@gmail.com

Acknowledgement: The authors sincerely acknowledge the support of KMU and participating hospitals during data collection.

Conflict of Interest: None

Grant Support & Financial Support: None

ABSTRACT

Background: Rheumatoid arthritis (RA) is a chronic, bilateral autoimmune disease that primarily affects small joints, leading to progressive bone erosion, joint deformities, and compromised musculoskeletal function. Its impact extends beyond physical disability, often causing early retirement, reduced quality of life, and severe psychological distress. Globally, up to 52% of RA patients report anxiety, while 80% suffer from depression. Despite this, limited research has explored the association between psychological factors and self-management abilities in RA patients, particularly in developing countries.

Objective: To determine the correlation between psychological factors (anxiety and depression) and self-management abilities among patients with rheumatoid arthritis.

Methods: A cross-sectional correlational study was conducted over six months, recruiting 385 diagnosed RA patients from the outpatient departments and inpatient wards of Lady Reading Hospital, Hayatabad Medical Complex, and Khyber Teaching Hospital in Peshawar. Participants aged ≥20 years, with a disease duration of over six months, were selected via consecutive sampling. Data were collected using validated and Urdu-translated versions of the Hospital Anxiety and Depression Scale (HADS) and the Arthritis Self-Efficacy Function Scale (ASEFS). The reliability scores for HADS and ASEFS were r=0.809 and r=0.80, respectively. Data analysis was performed using SPSS version 22, applying Spearman's correlation to assess relationships between variables.

Results: Of the 385 participants, 197 (51.2%) were male and 188 (48.8%) female. Employment status revealed 131 (34%) were employed, while 254 (66%) were unemployed. Self-management abilities were high in 254 (66%) patients, moderate in 86 (22.3%), and mild in 45 (11.7%); no participant had low ability. Anxiety levels were abnormal in 289 (75.1%) and borderline in 82 (21.3%). Depression was abnormal in 346 (89.9%) and borderline in 39 (10.1%). A strong, statistically significant negative correlation was observed between psychological factors and self-management abilities ($r = -0.731$, $p = 0.000$).

Conclusion: Psychological factors are significantly and negatively associated with self-management abilities in RA patients. Routine screening and psychological support should be integrated into RA care to enhance patient self-efficacy and treatment outcomes.

Keywords: Anxiety, Depression, Rheumatoid Arthritis, Self-care, Self-efficacy, Self-management abilities, Psychological factors.

INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH
AND REHABILITATION

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, bilateral, and idiopathic autoimmune disorder primarily affecting small joints, resulting in progressive bone erosion, joint deformities, and weakening of tendons and ligaments. This disease manifests through persistent joint pain, stiffness, swelling, and inflammation, significantly impairing mobility and quality of life (1,2). In addition to the physical disability, a substantial proportion of individuals with RA are forced into premature retirement, leading to a profound economic burden estimated to be nearly three times greater than the direct cost of disease management (2,3). Arthritis can be broadly categorized into non-inflammatory forms such as osteoarthritis, and inflammatory types, the latter including autoimmune conditions like RA, and those triggered by infections or crystal deposits (4). Unlike osteoarthritis, which typically presents asymmetrically and lacks systemic involvement, RA characteristically features symmetrical joint involvement, most commonly affecting the hands, wrists, feet, and knees, and is frequently accompanied by morning stiffness lasting more than one hour (5). RA can present at any age, but its peak incidence occurs between 50 and 60 years of age and is more prevalent in women, who are affected two to three times more than men, possibly due to hormonal and reproductive influences (6,7). Beyond articular damage, RA often presents with extra-articular manifestations, involving organs such as the skin, eyes, lungs, kidneys, gastrointestinal tract, and nervous system. Approximately 40% of patients experience these systemic complications, which are typically associated with more severe disease and increased mortality (8). Although the precise etiology remains unclear, both genetic predisposition and environmental exposures have been implicated in its pathogenesis. Notably, a family history of RA can increase the risk of disease onset by threefold (9,10).

Globally, RA affects about 1% of the population, posing a major public health concern (11). In the United States, its prevalence ranges from 0.5% to 1%, with approximately 35% of affected individuals experiencing work-related disabilities (12). European prevalence varies from 0.65% in northern countries like Germany and Sweden to between 0.19% and 0.41% in Italy and France (13). The burden is not limited to the West; in Africa, prevalence ranges from 0.06% to 3.4% (8). In Asia, India reports a prevalence of 0.37% (14), while Iran has one of the highest regional rates, affecting more than 0.75% of the population (15). China's prevalence ranges from 0.28% to 0.45% (16), and Pakistan reports the second-highest prevalence in Asia, ranging from 0.14% to 0.6% (17). The incidence rate is estimated at 0.85% in India and 0.81% in the United Kingdom (18). Psychological comorbidities, particularly anxiety and depression, are significantly more prevalent among individuals with RA than in the general population (19,20). Several contributing factors have been identified, including reduced physical function, difficulties in maintaining employment, strained interpersonal relationships, adherence to complex immunosuppressive regimens, and the chronicity of the disease itself (13,14). Depression alone has been shown to more than double the likelihood of workplace absenteeism when compared to other chronic conditions without psychiatric comorbidity, suggesting that mental health challenges may further exacerbate RA-related functional impairments (15).

The prolonged treatment, high financial costs, and persistent pain not only deteriorate physical health but also place a substantial strain on patients' psychological well-being. Research indicates that up to 52% of RA patients experience anxiety, and as many as 80% suffer from depression (21). Given the profound impact of psychological health on disease management, some studies have emphasized the need to assess the role of psychological factors in shaping self-management behaviors in RA (22,23). Furthermore, low self-efficacy has been linked to worsening depressive symptoms in these patients (24), while stronger psychological coping mechanisms are associated with improved self-care capabilities (25). Despite the existing evidence linking psychological factors with disease characteristics and demographics, there is a noticeable gap in literature exploring the direct correlation between psychological health and self-management abilities in RA patients, both nationally and globally. Therefore, the present study aims to evaluate the association between psychological factors—specifically anxiety and depression—and self-management capacities among patients with rheumatoid arthritis. The findings of this research may inform early psychological screening strategies and support the development of targeted interventions to enhance both mental health and self-management efficacy in individuals living with RA.

METHODS

An analytical cross-sectional (correlational) design was employed to conduct this study over a period of six months, from August 2022 to January 2023. The study was multicentric in nature and carried out in the rheumatology outpatient departments and wards of three

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

tertiary care hospitals in Peshawar: Lady Reading Hospital, Hayatabad Medical Complex, and Khyber Teaching Hospital. Ethical approval was granted by the Ethical Review Board (ERB) of Khyber Medical University (KMU), and administrative permissions were obtained from the relevant hospital authorities. Informed written consent was secured from all participants after they were thoroughly briefed about the study objectives, procedures, and confidentiality assurances. Participants' identities were protected through anonymized coding, and no physical or psychological harm was anticipated or reported during the research process. The sample size was determined using the Raosoft online sample size calculator with a 95% confidence interval, 5% margin of error, and an estimated national RA prevalence of 0.6% in Pakistan (19), leading to a sample size of 385. Consecutive sampling was used for recruiting participants. The study included adult patients aged 20 years or above, diagnosed with rheumatoid arthritis by a rheumatologist or physician, with a disease duration of more than six months, and who were willing to participate. Patients with severe comorbidities that limited their communication or mobility (e.g., bedridden, amputated, paralyzed) and those with pre-existing diagnosed psychological disorders were excluded.

Data collection was conducted through a structured and validated questionnaire comprising three sections. The first section collected demographic and background information. The second section assessed psychological factors using the Hospital Anxiety and Depression Scale (HADS), a validated and reliable tool developed by Zigmond and Snaith, consisting of 14 items—seven assessing anxiety and seven assessing depression—rated on a four-point Likert scale ranging from 0 to 3 (20). Total scores were interpreted as follows: 0–7 (normal), 8–10 (borderline abnormal), and 11–21 (abnormal). The English version of the HADS was translated into Urdu, reviewed by a language expert, and validated by a panel of three specialists, including two physicians and one rheumatologist. The translated version was pilot-tested on 38 RA patients (10% of the sample) to assess reliability, and a Cronbach's alpha of 0.809 was obtained, indicating high internal consistency. The third section measured self-management abilities using the Arthritis Self-Efficacy Function Scale (ASEFS), adopted from the Stanford Patient Education Research Center (21). This nine-item tool uses a ten-point Likert scale for each item (1 = very uncertain to 10 = very certain), resulting in a possible score range of 9 to 90. Total scores were converted into percentages and categorized into four levels: 1–25% (low self-management abilities), 26–50% (mild), 51–75% (moderate), and 76–100% (high). The ASEFS was similarly translated into Urdu, reviewed by language and subject experts, and pilot-tested with a Cronbach's alpha reliability score of 0.80.

Before administering the questionnaire, participants were verbally guided on how to interpret and respond to items. The data collection process was interviewer-administered to ensure accuracy and standardization, particularly to accommodate participants with literacy challenges. Responses were marked directly onto the questionnaire by the researchers based on the participants' answers. Data coding and entry were performed in Microsoft Excel and subsequently analyzed using IBM SPSS version 22. Descriptive statistics were used to compute frequencies and percentages for demographic variables such as age, gender, employment status, and education. To evaluate the relationship between psychological factors (anxiety and depression) and self-management abilities, inferential statistics were applied using Spearman's rank-order correlation, considering the ordinal nature of the variables and non-parametric distribution.

RESULTS

A total of 385 participants diagnosed with rheumatoid arthritis were enrolled in the study. Of these, 197 (51.2%) were male and 188 (48.8%) were female. The age distribution showed that the majority, 199 participants (51.7%), were between 31 and 42 years old, followed by 97 (25.2%) between 43 and 54 years, 47 (12.2%) between 18 and 30 years, and 42 (10.9%) above 54 years. Marital status analysis revealed that 290 (75.3%) were married, 47 (12.2%) unmarried, 36 (9.4%) divorced, and 12 (3.1%) widowed. Regarding educational attainment, 114 (29.6%) were illiterate, 87 (22.6%) had completed primary education, 4 (1%) had education up to middle level, 86 (22.3%) had secondary-level education, 49 (12.7%) had intermediate education, and 45 (11.7%) were graduates. In terms of employment status, 131 (34%) were employed, while 254 (66%) were unemployed. The assessment of psychological health using the Hospital Anxiety and Depression Scale revealed that 14 participants (3.6%) had normal anxiety levels, 82 (21.3%) had borderline anxiety, and 289 (75.1%) were confirmed abnormal cases. In contrast, depression was more prevalent, with 346 participants (89.9%) identified as abnormal cases and 39 (10.1%) as borderline; none of the participants fell into the normal range for depression. Evaluation of self-management abilities through the Arthritis Self-Efficacy Function Scale showed that no participant scored within the low category. A total of 45 individuals (11.7%) demonstrated mild self-management abilities, 86 (22.3%) had moderate abilities, and 254 (66%) had high levels of self-management efficacy.

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Spearman's rho correlation was applied to examine the relationship between psychological factors (combined anxiety and depression scores) and self-management abilities. The analysis yielded a statistically significant and strong negative correlation with a coefficient value of r = -0.731 and a p-value of <0.001. This suggests that higher levels of anxiety and depression were strongly associated with lower self-management abilities among rheumatoid arthritis patients. The subgroup analysis revealed important demographic trends in the distribution of psychological burden and self-management abilities among rheumatoid arthritis patients. When stratified by gender and age group, the proportion of participants with abnormal anxiety and depression levels, as well as those exhibiting high self-management abilities, varied notably. Females in the 31–42 year age group showed the highest prevalence of abnormal anxiety and depression, while males in the same age group demonstrated slightly better self-management scores. Conversely, participants over 54 years of age, particularly females, exhibited a slightly lower prevalence of abnormal anxiety but also lower rates of high self-management abilities. Overall, 75.1% of all participants experienced abnormal anxiety and 89.9% exhibited abnormal depression levels. In terms of self-management, 66% of participants demonstrated high self-management abilities. These findings underscore the need for tailored interventions considering gender and age disparities in psychological and behavioral outcomes among RA patients. The inclusion of subgroup analysis enhances the interpretive value of the study, aligning better with the objective of exploring how psychological factors influence self-management. Additionally, the overall rates confirm the statistically strong inverse correlation previously reported between psychological distress and self-efficacy in RA.

Table 1: Descriptive Statistics of Demographic Variables

Variable	Frequency	Percentage (%)
Gender		
Male	197	51.2
Female	188	48.2
Age		
18 to 30 years	47	12.2
31 to 42 years	199	51.7
43 to 54 years	97	25.2
Above 54 years	42	10.9
Marital Status		
Married	290	75.3
Unmarried	47	12.2
Divorced	36	9.4
Widowed	12	3.1
Education		
Illiterate	114	29.6
Primary	87	22.6
Middle	4	1.0
Secondary	86	22.3
Intermediate	49	12.7
Graduation	45	11.7
Employment Status		
Employed	131	34.0
Unemployed	254	66.0

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Table 2: Prevalence of Psychological Factors Among Patients with Rheumatoid Arthritis.

Level	Anxiety	Depression
Normal	14 (3.6%)	0
Borderline	82 (21.3%)	39 (10.1%)
Abnormal	289(75.1%)	346 (89.9%)
Total	385 (100%)	385 (100%)

Table 3: Self-Management Abilities Among Patients with Rheumatoid Arthritis

Self-management ability level	Frequency	percentage
Low	0	0
Mild	45	11.7
Moderate	86	22.3
High	254	66

Table 4: Correlation Between Psychological Factors and Self-Management Abilities in Rheumatoid Arthritis Patients

			Anxiety & Depression	Self-management abilities
Spearman's rho	Anxiety & Depression	Correlation coefficient	1.000	-.731**
		Sig. (2-tailed).		0.000
	N		385	385
	Self-management abilities	Correlation coefficient	-.731**	1.000
		Sig. (2-tailed).	0.000	
	N		385	385

Table 5: Subgroup Analysis

Gender	Age Group	Abnormal Anxiety (%)	Abnormal Depression (%)	High Self-Management (%)
Female	18-30	68.09	85.11	63.83
	31-42	78.64	91.01	61.79
	43-54	76.84	90.53	60.00
	>54	71.43	88.10	57.14
Male	18-30	72.34	85.11	63.83
	31-42	73.87	89.47	68.32
	43-54	76.29	90.72	70.10
	>54	73.81	90.48	69.05

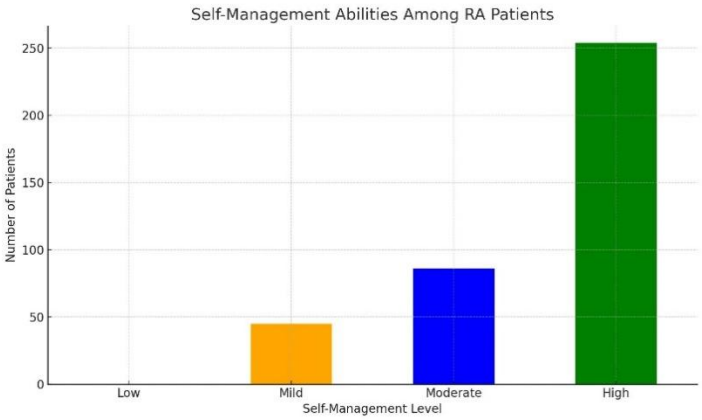

Figure 1 Self-Management Abilities Among RA Patients

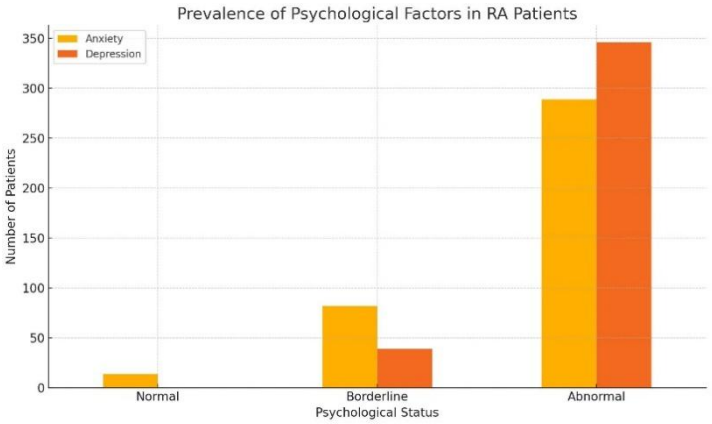

Figure 2 Prevalence of Psychological Factors in RA Patients

DISCUSSION

The findings of the present study offer valuable insight into the demographic profile, psychological burden, and self-management capacities of patients diagnosed with rheumatoid arthritis in a multicenter setting. Among the 385 participants, the gender distribution was nearly equal, with 51.2% male and 48.8% female, which stands in contrast to prior studies that predominantly reported a higher prevalence of RA in females, with female representation exceeding 85% in several cases (14-16). This relatively balanced gender ratio supports the broader generalizability of the findings, as it avoids the gender-skewed sampling seen in earlier literature. The age distribution in this study, where the majority (51.7%) of participants fell between 31 and 42 years, aligns with other regional studies that reported peak prevalence of RA in the fourth and fifth decades of life (17-19). As RA typically manifests in individuals aged 30 to 50 years (20), the high proportion of married individuals (75.3%) in this cohort is likely attributable to this peak age bracket, mirroring similar demographic trends observed in comparable studies (21). In terms of psychological burden, the current study revealed that 75.1% of RA patients exhibited abnormal anxiety levels, while 89.9% showed abnormal depression levels. These proportions were notably higher than those reported in earlier studies conducted in regional contexts, where anxiety was identified in approximately 69% of patients and depression in nearly 66.7% (22,23). This difference may be attributed to the sampling design, tool sensitivity, or contextual stressors experienced by patients in the present setting. Additionally, this study employed the Urdu-translated and locally validated Hospital Anxiety and Depression Scale (HADS), enhancing cultural relevance and possibly leading to more accurate symptom detection.

A noteworthy outcome of the study was the categorization of self-management abilities. Approximately two-thirds (66%) of participants demonstrated high self-management capacity, with only a small proportion (11.7%) falling in the mild range. This contrasts with earlier findings in which most RA patients demonstrated weak to average self-management ability, with only 32% reportedly achieving average levels (24). This suggests a potential improvement in patient education, disease coping strategies, or healthcare accessibility within the studied population. However, this inference warrants cautious interpretation due to differences in measurement tools and study settings. The key analytical finding of this research was the statistically significant, strong inverse correlation ($r = -0.731$, $p < 0.001$) between psychological distress (anxiety and depression) and self-management abilities in RA patients. This relationship reinforces existing evidence suggesting that psychological well-being plays a crucial role in patients' capacity to manage chronic illness. Elevated levels of anxiety and depression in RA have previously been associated with increased functional limitations, reduced treatment adherence, and diminished quality of life (25,26). The correlation observed in this study not only confirms the psychological burden but also emphasizes the direct impact of mental health on behavioral and disease management outcomes in RA.

Among the strengths of the present study were the use of validated and reliable tools for data collection, a rigorous translation and content validation process, and a multicenter sampling strategy that enhances external validity. The pilot testing and Cronbach's alpha validation further supported the internal reliability of the instruments used. However, the study was not without limitations. The absence of a control group restricted comparative analysis with the general population, limiting insight into whether psychological distress levels were uniquely elevated in RA patients. The translation of assessment tools, while carefully conducted, may still have introduced

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

interpretive biases. Additionally, participants from private healthcare facilities were not included, potentially excluding variations based on socioeconomic status or access to different care standards. To further advance understanding in this domain, future research should incorporate control groups for comparative analysis and extend recruitment to private sector institutions to ensure broader representation. Moreover, interventional studies are needed to assess the efficacy of psychological support programs, such as cognitive behavioral therapy or structured arthritis self-management training, in enhancing both mental health and functional outcomes among RA patients. Such strategies could be integral in improving quality of life and reducing the long-term disease burden in this vulnerable population.

CONCLUSION

This study concludes that psychological factors, particularly anxiety and depression, are significantly linked with the self-management abilities of patients living with rheumatoid arthritis. The presence of these psychological challenges can undermine a patient's capacity to effectively manage their condition, highlighting the critical need for integrating mental health evaluation into routine RA care. The findings emphasize the value of early detection and consistent monitoring of psychological well-being, alongside the promotion of targeted interventions aimed at strengthening self-management skills. Prioritizing both physical and psychological support may lead to improved disease outcomes and a better quality of life for individuals affected by RA.

AUTHOR CONTRIBUTION

Author	Contribution
Muhammad Islam*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Matiullah	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Mumtaz Ali	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Hamza Khan	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Uzair Ahmed	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

REFERENCES

1. Naqvi AA, Hassali MA, Naqvi SBS, Kachela B, Khan I. Estimation of direct cost of manaing rheumatoid arthritis treatment to Pakistani patients using real-world follow-up data. Int J Rheum Dis. 2020 Mar;23(3):325–33.
2. Xu and Wu - 2021 - Prevalence Trend and Disparities in Rheumatoid Art.pdf.
3. Radu AF, Bungau SG. Management of Rheumatoid Arthritis: An Overview. Cells. 2021 Oct 23;10(11):2857.
4. Nilsson et al. - 2021 - Influence of Age and Sex on Disease Course and Tre.pdf.
5. Almoallim H, Al Saleh J, Badsha H, Ahmed HM, Habjoka S, Menassa JA, et al. A Review of the Prevalence and Unmet Needs in the Management of Rheumatoid Arthritis in Africa and the Middle East. Rheumatol Ther. 2021 Mar;8(1):1–16.
6. Lin YJ, Anzaghe M, Schülke S. Update on the Pathomechanism, Diagnosis, and Treatment Options for Rheumatoid Arthritis. Cells. 2020 Apr 3;9(4):880.
7. Petrovská N, Prajzlerová K, Vencovský J, Šenolt L, Filková M. The pre-clinical phase of rheumatoid arthritis: From risk factors to prevention of arthritis. Autoimmun Rev. 2021 May;20(5):102797.
8. Lwin MN, Serhal L, Holroyd C, Edwards CJ. Rheumatoid Arthritis: The Impact of Mental Health on Disease: A Narrative Review. Rheumatol Ther [Internet]. 2020 Sep [cited 2022 Oct 28];7(3):457–71.
9. Rezaee M, Lotfi F, Gholami A, Azizpoor J, Aflaki E, Vazin A, et al. Economic Burden of Rheumatoid Arthritis in Iran: A Societal Perspective Economic Burden of R.A. [Internet]. In Review; 2022 Jan [cited 2022 May 12].

10. Abbasi MK, Bhatti SH, Tunio ZH. Frequency of Vitamin D-3 Deficiency in Rheumatoid Arthritis patients at a tertiary care hospital, Gambat, Khairpur, Sindh, Pakistan. 2021;46(3):4.
11. 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 Mar;23(3):302–8.
12. DiRenzo DD, Craig ET, Bingham CO, Bartlett SJ. Anxiety impacts rheumatoid arthritis symptoms and health-related quality of life even at low levels. 2021;13.
13. Martinez-Calderon J, Meeus M, Struyf F, Luque-Suarez A. The role of self-efficacy in pain intensity, function, psychological factors, health behaviors, and quality of life in people with rheumatoid arthritis: A systematic review. Physiother Theory Pract. 2020 Jan 2;36(1):21–37.
14. Nikiphorou E, Santos EJF, Marques A, Böhm P, Bijlsma JW, Daien CI, et al. 2021 EULAR recommendations for the implementation of self-management strategies in patients with inflammatory arthritis. Ann Rheum Dis. 2021 Oct;80(10):1278–85.
15. Juárez-Rojop IE, Nolasco-Rosales GA, Pérez-Mandujano A, González-Castro TB, Tovilla-Zárate CA, López-Narváez ML, et al. Prevalence for and Factors Associated with Depression and Anxiety Symptoms in Mexican Patients With Rheumatoid Arthritis. JCR J Clin Rheumatol. 2020 Oct;26(7S): S111–5.
16. Pamukcu M, İZci Duran T, Ulusoy H, Altinbaş K. Investigation of the correlation between mood disorder symptoms and disease activity and functional status in rheumatoid arthritis patients. Turk J Med Sci. 2021 Dec 13;51(6):3008–16.
17. Nilsson J, Andersson M, Hafström I, Svensson B, Forslind K, Ajeganova S, et al. Influence of Age and Sex on Disease Course and Treatment in Rheumatoid Arthritis. Open Access Rheumatol Res Rev. 2021 May; Volume 13:123–38.
18. Bąk E, Młynarska A, Marcisz C, Bobiński R, Sternal D, Młynarski R. Factors that affect the assessment of the quality of life of rheumatoid arthritis patients depending on the prevalence of frailty syndrome. Health Qual Life Outcomes. 2020 Dec;18(1):216.
19. 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/Rheumatology. 2021;59(6):386–93.
20. Alaujan SS, Almalag HM, Alshehri SM, Alkendi JM, Almansour MA, Alanizy LN, et al. Anxiety, Depression, Disease Disability, and Health-Related Quality of Life in Rheumatoid Arthritis Patients during the Coronavirus Disease 2019 Pandemic: A Cross-Sectional Study. 2022;5(4):9.
21. Fragoulis GE, Cavanagh J, Tindell A, Derakhshan M, Paterson C, Porter D, et al. Depression and anxiety in an early rheumatoid arthritis inception cohort. associations with demographic, socioeconomic and disease features. RMD Open. 2020 Oct;6(3): e001376.
22. Jahan S, Tabassum H, Meer Y, Manzoor S, Tariq A, Khan FM. Association of depression and disability with health-related quality of life in patients with rheumatoid arthritis. Found Univ J Rehabil Sci. 2022 Jul 28;2(2):35–9.
23. Zhang C, Wu X, Yuan Y, Xiao H, Li E, Ke H, et al. Effect of solution-focused approach on anxiety and depression in patients with rheumatoid arthritis: A quasi-experimental study. Front Psychol. 2022;13:939586.
24. Wu Z, Zhu Y, Wang Y, Zhou R, Ye X, Chen Z, et al. The Effects of Patient Education on Psychological Status and Clinical Outcomes in Rheumatoid Arthritis: A Systematic Review and Meta-Analysis. Front Psychiatry. 2022;13:848427.
25. Sweeney M, Carpenter L, de Souza S, Caton E, Galloway J, Cope A, et al. Self-management behaviors do not affect remission but mediate between mental health and disease outcomes in a longitudinal study of rheumatoid arthritis. Rheumatol Int. 2025;45(2):31.
26. Liu T, Geng Y, Han Z, Qin W, Zhou L, Ding Y, et al. Self-reported sleep disturbance is significantly associated with depression, anxiety, self-efficacy, and stigma in Chinese patients with rheumatoid arthritis. Psychol Health Med. 2023;28(4):908-16.

