Quality of Life and Medication Adherence in Rheumatoid Arthritis Patients

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ABSTRACT

Background: Rheumatoid arthritis (RA) is a chronic autoimmune disease that affects millions of people worldwide. It can cause joint pain, inflammation, and stiffness, leading to decreased physical function and reduced quality of life. To manage RA, patients often rely on medication adherence, which can also affect their quality of life. **Objectives:** This study's objective was to investigate the relationship between Rheumatoid Arthritis patients' medication adherence and their quality of life and to evaluate the barriers involved in the intervention or the effectiveness of interventions in improving quality of life and medication adherence in RA patients. **Methodology:** Various tools have been developed to diagnose and measure RA disease activity, including the Quality of Life Scale (EQ-5D-5L), the Medication Adherence scale (MMAS). **Results:** A significant proportion of respondents (39.6%) reported having no problems in taking care of themselves. However, a considerable number of individuals indicated slight (20.8%), moderate (11.3%), severe (13.2%), or complete inability (9.4%) to take care of themselves. A considerable number of individuals reported slight (20.8%), moderate (12.3%), severe (12.3%), or complete inability (5.7%) to perform their usual activities. This highlights the impact of medication adherence on functional capacity and the ability to engage in work, household tasks, and leisure activities. Healthcare professionals should encourage medication adherence, monitor disease activity regularly, and provide appropriate interventions to optimize disease control and enhance patient outcomes. **Conclusion:** The questionnaire results highlight the significant impact of medication adherence on the quality of life of individuals with rheumatoid arthritis. Proper adherence to prescribed medications can improve self-care ability, functional capacity, pain management, and mental well-being. Addressing barriers to adherence and providing support for medication management are crucial in optimizing outcomes and enhancing the overall quality of life for rheumatoid arthritis patients.

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INTRODUCTION

Rheumatoid arthritis (RA) is a persistent autoimmune disease that induces joint inflammation, stiffness, and swelling, leading to a decreased quality of life for patients due to its effect on their daily activities and overall well-being. Proper RA management necessitates using medications to control inflammation and prevent joint damage (Bechman K 2021) [1]. While rheumatoid arthritis may have existed in early Native American populations several thousand years ago, it might not have appeared in Europe until the 17th century. However, recent studies have implicated T-cell-mediated antigen-specific responses, T-cell-independent cytokine networks, and aggressive tumor-like behavior of rheumatoid synovium in the pathogenesis of the disease (Firestein 2003) [2] Efforts are needed to improve RA management in Pakistan and other countries through increased awareness, education, and access to healthcare services. Patient education programs, community-based initiatives, and government policies to support affordable and accessible healthcare can play a role in improving the quality of life and medication adherence in RA patient (John 2017) [3]

Pathogenesis of Rheumatoid Arthritis:

The pathogenesis of RA involves a complex interplay between genetic, environmental, and immunological factors, leading to chronic inflammation and the destruction of the synovial joints (Schett 2011) [4] Rheumatoid arthritis is a chronic inflammatory disorder that affects the joints. It is characterized by synovial inflammation and hyperplasia, which leads to swelling, auto-antibody production (rheumatoid factor and anti–citrullinated protein antibody, cartilage and bone destruction (McInnes and Schett 2011) [5]. Genome wide analyses make it clear that immune regulatory factors underlie the disease (20 and A. 2 2007).

Sign and Symptoms:

The severity and manifestation of symptoms vary from person to person. Joint pain is a major source of disability for rheumatoid arthritis patients, affecting their ability to work, socialize, and perform activities of daily living (McInnes 2011) [5]. Patients with RA may need extra time and assistance to get moving in the morning, and stiffness can also make it difficult for them to maintain a regular exercise routine (Anyfanti

2022) [6]. Inflammation and swelling are hallmark symptoms of rheumatoid arthritis, which can cause discomfort, pain, and limited mobility. Swelling can be particularly severe during flare-ups and can make joints feel warm, tender, and stiff (van Dijk 2022) [7].This leads to deformities of joints (Ren 2022) [8]. Weakness in the muscles and joints can be a result of the damage caused by rheumatoid arthritis (Yamada 2017) [9]. Patients with the disease may experience pain and discomfort, which can make it difficult to fall asleep or stay asleep. Sleep disturbances can lead to fatigue, irritability, and a decrease in overall quality of life (McBeth 2022) [10]. Anxiety is another common symptom in patients with rheumatoid arthritis, which can be caused by the fear of pain, disability, and loss of independence. Anxiety can further exacerbate the symptoms of rheumatoid arthritis, leading to a decreased quality of life (Smesam 2022) [11].

METHODOLOGY

Study design

This was a cross-sectional study conducted at Shalamar Hospital's outpatient department by using the quality of life scale (EQ-5D). EQ-5D is a standardized measure of health-related quality of life developed by the EuroQol Group. It is used to evaluate patient outcomes across five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. The original version of EQ-5D measures each domain on a scale with three severity levels. It has been used in a large number of cost-effectiveness evaluations (Hernández-Alava and Pudney 2017) [12]. Following ethical approval, the trial was carried out from December 2022 to May 2023. In total, 100 RA patients were enrolled in the study. All subjects participating in the study provided verbal consent and we used EQ-5D and MMAS for evaluation.

Study Population

The study population for the rheumatoid arthritis (RA) in Lahore consisted of individuals residing in Lahore, Pakistan. The study population included both males and females of different age groups, education levels, marital status, and employment status. The survey targeted individuals with and without a family history of RA to explore potential risk factors and associations.

Criteria for Inclusion

1. Patients with RA who have been diagnosed using the American College of Rheumatology (ACR)/European League against Rheumatism (EULAR) criteria from 2010.

2. Patients who have been diagnosed with RA for at least 3 months previous to the research invitation.

3. Patients who are over the age of 18

Criteria for Exclusion

1. Other than RA, musculoskeletal ailments

2. Recent RA surgery or anticipated RA surgery

3. the presence of more than three co-morbidities

4. Current or recent participation in another clinical trial.

Sample size calculation

Raosoft sample size calculator was used to calculate the sample size. The sample size was 100 when we considered margin of error 8.2% and confidence level l90 %

Ethical approval

The Department of Pharmacy at Riphah international university (RIU) and committee of Shalamar Hospital granted ethical approval to conduct a research study for assessing the Quality of life and Medication adherence in RA patients.

Statistical analysis

The study's data was processed using SPSS software to perform a descriptive frequency analysis of the data. These calculations were then used to make inferences and address the research question.

RESULTS

The results of this study offer a comprehensive view about the quality of life and medication adherence to the therapy.

By analyzing the frequency and percentage of responses, valuable insights are provided.

Demographic Characteristics: The majority of respondents (52.8%) fallen within the age range of 35-44 years old. The distribution of respondents across other age groups was relatively even. The survey sample consisted of slightly more male respondents (54.7%) than female respondents (39.6%). The largest proportion of respondents are married (47.2%), followed by single individuals (31.1%). Widowed, divorced, and separated individuals make up smaller percentages of the sample. The educational background of the respondents varied, with the highest proportion having completed a bachelor's degree (23.6%). There is a notable percentage of respondents who were not educated (26.4%), and smaller percentages with primary, middle, matriculation, intermediate, or higher education qualifications. The employment status of the respondents was diverse. The largest group consisted of individuals who were employed full-time (32.1%), followed by the unemployed (30.2%) and the self-employed (11.3%). A smaller portion of the sample was retired, and some individuals fall into other employment categories. The distribution of monthly income showed that a significant proportion of respondents (34.0%) earned less than 10,000 PKR. There was also a notable representation in the 30,000-50,000 PKR income range (18.9%), while smaller percentages fallen into other income brackets. Approximately 41.5% of respondents had a family history of rheumatoid arthritis (RA), while the majority (52.8%) did not have a family history of this condition. Regarding mobility, the largest group of respondents (34.9%) reported having no problems in walking around. However, a considerable portion indicated slight problems (28.3%), and smaller percentages reported moderate or severe problems or being unable to walk around.

Demographic Data	Categories	Frequency (n=100)	Percentage %
Age	35-44 years old	56	52.8
	45-54 years old	14	13.2
	55-64 years old	22	20.8
	65 years or older	8	7.5
Gender	Male	58	54.7
	Female	42	39.6
Marital status	Single	33	31.1
	Married	50	47.2
	Widowed	10	2.8
	Divorced	3	9.4
	Separated	4	3.8
level of education	Not educated	28	26.4
	Primary (1-5) education	4	3.8
	Middle (6-8) education	5	4.7
	Matriculation(9-10) education	12	11.3
	Intermediate (11-12) education	19	17.9
	Bachelor's degree	25	23.6
	Master's degree or higher	7	6.6
Current employment status	Employed full-time	34	32.1
	Self-employed	12	11.3
	Unemployed	32	30.2
	Retired	6	5.7
	Other	16	15.1
Monthly income	Less than 10,000 PKR	36	34.0
	10,000-30,000 PKR	10	9.4
	30,000-50,000 PKR	20	18.9
	50,000-100,000 PKR	12	11.3
	More than 100,000 PKR	22	20.8
Family history	Yes	44	41.5
	No	56	52.8
Mobility statement	I have no problems in walking around	37	34.9
	I have slight problems in walking around	30	28.3
	I have moderate problems in walking around	8	7.5
	I have severe problems in walking around	11	10.4
	I am unable to walk around	14	13.2

Quality of Life and Medication Adherence Response in RA patients:

A significant proportion of respondents (39.6%) reported having no problems in taking care of themselves. However, a considerable number of individuals indicated slight (20.8%), moderate (11.3%), severe (13.2%), or complete inability (9.4%) to take care of themselves. These findings suggested that medication adherence play a crucial role in maintaining independence and the ability to perform self-care tasks among RA patients. Similar to self-care ability, a substantial portion of respondents (43.4%) reported having no problems in performing their usual activities. However, a considerable number of individuals reported slight (20.8%), moderate (12.3%), severe (12.3%), or complete inability (5.7%) to perform their usual activities. This highlights the impact of medication adherence on functional capacity and the ability to engage in work, household tasks, and leisure activities. The majority of respondents reported experiencing some level of pain or discomfort in the last 24 hours. While 29.2% reported no pain or discomfort, significant proportions indicated slight (19.8%), moderate (15.1%), severe (16.0%), or extreme (14.2%) levels of pain or discomfort. Proper medication adherence was crucial for pain management in rheumatoid arthritis patients and can greatly impact their overall quality of life. A considerable number of respondents reported experiencing anxiety or depression to varying degrees. While 14.2% reported no anxiety or depression, significant proportions indicated slight (22.6%), moderate (20.8%), severe (9.4%), or extreme (7.5%) levels of anxiety or depression. Adherence to medication regimens can help alleviate symptoms and improve mental well-being in individuals with rheumatoid arthritis. A notable proportion of respondents admitted to occasionally forgetting to take their medication (26.4%), skipping doses or not taking medication at the recommended time (26.4%), and stopping medication without consulting their healthcare provider (23.6%). Additionally, a considerable number reported running out of medication before obtaining a refill (30.2%) and taking less medication than prescribed to make it last longer (17.0%). These findings emphasize the need for interventions and support to improve medication adherence in rheumatoid arthritis patients.

Variables to be assessed	Categories	Frequency	Percentage %
Which statement best describes your ability to take care of yourself?	I have no problems in taking care of myself	42	39.6
	I have slight problems in taking care of myself	22	20.8
	I have moderate problems in taking care of myself	12	11.3
	I have severe problems in taking care of myself	14	13.2
	I am unable to take care of myself	10	9.4
Which statement best describes your ability to perform your usual activities (such as work, study, housework, family or leisure activities)?	I have no problems in performing my usual activities	46	43.4
	I have slight problems in performing my usual activities	22	20.8
	I have moderate problems in performing my usual activities	13	12.3
	I have severe problems in performing my usual activities	13	12.3
	I am unable to perform my usual activities	6	5.7

Which statement best describes the amount of pain or discomfort you have experienced in the last 24 hours?	I have no pain or discomfort	31	29.2
	I have slight pain or discomfort	21	19.8
	I have moderate pain or discomfort	16	15.1
	I have severe pain or discomfort	17	16.0
	I have extreme pain or discomfort	15	14.2

Frequency and Percentage of Quality of life and Medication Adherence response of RA

Which statement best describes the amount of anxiety or depression you have experienced in the last 24 hours?	I have no anxiety or depression	15	14.2
	I have slight anxiety or depression	24	22.6
	I have moderate anxiety or depression	22	20.8
	I have severe anxiety or depression	10	9.4
	I have extreme anxiety or depression	8	7.5
Do you ever forget to take your medication?	Never	27	25.5
	Rarely	19	17.9
	Sometimes	28	26.4
	Often	18	17.0
	Always	8	7.5
Do you ever decide to skip a dose or not take your medication at the recommended time?	Never	36	34.0
	Rarely	17	16.0
	Sometimes	28	26.4
	Often	15	14.2
	Always	4	3.8
Do you ever stop taking your medication without discussing it with your healthcare provider?	Never	43	40.6
	Rarely	7	6.6
	Sometimes	25	23.6
	Often	14	13.2
	Always	11	10.4
Have you ever run out of your medication before getting a refill?	Never	34	32.1
	Rarely	20	18.9
	Sometimes	32	30.2
	Often	12	11.3
	Always	2	1.9
Have you ever taken less medication than prescribed to make it last longer?	Never	45	42.5
	Rarely	25	23.6
	Sometimes	18	17.0
	Often	10	9.4
	Always	2	1.9

DISCUSSION

RA is a chronic inflammatory disease that can affect daily activities, including work. Permanent work disability is common among RA patients, leading to decreased quality of life and high costs (van Vilsteren, Boot et al. 2015) [13]. Predictors for permanent work disability in RA patients have been extensively studied, highlighting the importance of personal factors such as education level and age, as well as disease-related factors such as perceived health complaints and limitations in daily activities. (Zhang and Anis 2011) [14].

From the data we can see that out of the total number of participants, 39.6% reported having no problems taking care of themselves, Chronic illness has traditionally been viewed by researchers as a condition that fluctuates over time due to physiological changes. These findings are persistent in the study performed by Paterson in 2001(Paterson 2001) [15]. While 20.8% reported having slight problems, 11.3% reported having moderate problems, 13.2% reported having severe problems, and 9.4% reported being unable to take care of themselves. Self-management education can improve outcomes and reduce costs for arthritis patients in certain circumstances Cited in the previous study performed by Bodenheimer in 2002 (Bodenheimer, Lorig et al. 2002) [16] The data in this study revealed that out of the total number of participants, 43.4% reported having no problems performing their usual activities, while 20.8% reported having slight problems, 12.3% reported having moderate problems, and 12.3% reported having severe problems. Functional impairment is one of the most important predictor of work disability (Puolakka, Kautiainen et al. 2005) [17]. The greatest increase occurs in the first three years of disease (Mau, Bornmann et al. 1996) [18]. Impairment in the usual activities has been reported in the various studies (Macedo, Oakley et al. 2009) [19]. In the discussion, it could be mentioned that these results provide insight into the impact of the condition on the ability of individuals to perform their usual activities. Further analysis could be done to identify factors that may contribute to the difficulties experienced by those who reported moderate to severe problems (Anderson, Bradley et al. 1985) [20]. This information could be used to develop interventions or strategies to help individuals overcome these difficulties and improve their ability to perform their usual activities (Hochberg, Chang et al. 1992) [21]. The results show that out of the total number of participants, 29.2% reported

having no pain or discomfort in the last 24 hours, while 19.8% reported having slight pain or discomfort, 15.1% reported having moderate pain or discomfort, 16.0% reported having severe pain or discomfort, and 14.2% reported having extreme pain or discomfort. Various studies have been done on the psychological predictors of pain severity one of them include the study performed by Ryan (Ryan and McGuire 2016) [22]. These findings suggest that a significant proportion of participants experience some level of pain or discomfort. Further analysis could be done to identify factors that may contribute to the pain and discomfort experienced by those who reported moderate to extreme levels (McWilliams, Zhang et al. 2012) [23]. This information could be used to develop interventions or strategies to help individuals manage their pain and discomfort and improve their overall well-being (Keefe, Affleck et al. 1997) [24]. These findings are related to the previous study performed by Flor and Turk (Flor and Turk 1988) [25]. From the data we can see that out of the total number of participants, 14.2% reported having no anxiety or depression in the last 24 hours, while 22.6% reported having slight anxiety or depression, 20.8% reported having moderate anxiety or depression, 9.4% reported having severe anxiety or depression, and 7.5% reported having extreme anxiety or depression. This suggests that a significant proportion of participants experience some level of anxiety or depression. Depression and anxiety are often reported by RA patients, with a prevalence of up to 43 and 89%. These findings are consistent in the study performed by Kekow and Moots (Kekow, Moots et al. 2011) [26]. The data in our study also shows that the total number of participants, 25.5% reported never forgetting to take their medication. While 17.9% reported rarely forgetting, 26.4% reported sometimes forgetting, 17.0% reported often forgetting. According to a study by Carolyn R. Harley and Jennifer R. Frytak published in the American Journal of Managed Care, compliance with treatment and dosage administration is higher among rheumatoid arthritis patients receiving infliximab compared to those receiving etanercept or methotrexate (Harley, Frytak et al. 2003) [27] and 7.5% reported always forgetting. These findings are persistent in the study performed by Elliot in 2008. According to multiple studies, adherence to medications for rheumatoid arthritis is low in adults, and is often less than 50% (Elliott 2008) [28]. This information could be used to develop interventions or strategies to help individuals remember to take their medication and improve

their overall adherence to their treatment regimen (Van Den Bemt, Zwikker et al. 2012) [29]. From the above data out of 100 individuals 40.6% reported never stopping taking their medication without discussing it with their health care provider, while 6.6% reported rarely doing so, These findings are cited in the study of Gadallah carried out in 2015 (Gadallah, Boulos et al. 2015) [30] 23.6% reported sometimes doing so, 13.2% reported often doing so, and 10.4% reported always doing so. This suggests that a significant proportion of participants stop taking their medication without discussing it with their healthcare provider. The most often reported reasons for noncompliance were side effects and fear of side effects (Müller, Kallikorm et al. 2012) [31]. The results show that out of the total number of participants, 42.5% reported never taking less medication than prescribed to make it last longer, while 23.6% reported rarely doing so, 17.0% reported sometimes doing so, 9.4% reported often doing so, and 1.9% reported always doing so. This suggests that a significant proportion of participants have taken less medication than prescribed to make it last longer due to cost effectiveness. According to a study by Efficacy, Tolerability and Cost Effectiveness of Disease-Modifying Anti-rheumatic Drugs and Biologic Agents in the Treatment of Rheumatoid Arthritis, published in the journal Drugs, drug costs of traditional DMARDs can be up to $3,000 per year, whereas for biologics, the yearly drug costs range between $16,000 and over $20,000 (Nurmohamed and Dijkmans 2005) [32].

CONCLUSION

In conclusion, the results show that a significant proportion of participants experience some level of difficulty in taking care of themselves and performing their usual activities, as well as experiencing pain, discomfort, anxiety, and depression. Additionally, a significant proportion of participants report forgetting to take their medication, deciding to skip a dose or not take it at the recommended time, stopping taking their medication without discussing it with their healthcare provider, running out of their medication before getting a refill, and taking less medication than prescribed to make it last longer. These findings highlight the challenges faced by individuals in managing their condition and the importance of developing interventions and strategies to help them improve their overall well-being and adherence to their treatment regimen.

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