Research Article

Association of Quality of Life and Disease Activity in Female Rheumatoid Arthritis Patients

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Abstract

Background: Rheumatoid arthritis is a chronic inflammatory autoimmune disease that affects every aspects of quality of life and varies with disease severity especially among females.

Objective: To assess quality of life (QOL) in female rheumatoid arthritis patients and its relationship with disease activity.

Methods: It was a cross sectional analytical study with 140 rheumatoid arthritis female patients recruited through convenient sampling from October 2018 to January 2019 from the Rheumatology out-patient department of Shaikh Zayed Hospital, Lahore. World Health Organization Quality of Life questionnaire (WHOQOL-BREF) was used to assess quality of life and Disease Activity Score (DAS - 28) to assess activity of disease. Data was entered and analyzed by using SPSS version 20.0. Mean ± Standard Deviation (SD), median, frequency and percentages were used to describe various variables. The effect of sociodemographic and disease factors on four health domains of WHOQOL-BREF scores was examined by using multiple linear regression models with backward removal method. P-value < 0.05 was considered statistically significant.

Results: All patients were female with an average age of 36.4±5.4 years, 21.4% were obese, mostly unemployed. The DAS-28 was 2.9 ± 0.7, with 39.3% of the patients in remission phase. On the 0 - 100 scale WHOQOL-BREF physical score was minimum, social and environmental scores have the highest median value. Education, being married and being employed had a positive effect on various scores while high DAS had a negative effect on all scores.

Conclusion: Physical health domain of WHOQOL-BREF is most affected in Pakistani female rheumatoid arthritis patients. Increasing activity of disease worsens the QOL. Education, marital status, and employment has a positive effect on QOL.

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Introduction:

Rheumatoid arthritis is a chronic autoimmune disease affecting almost 1% of the general population.[1] It mainly targets synovial joints resulting in joint destruction and disability, and in severe cases, it may cause life-threatening extra articular complications.[2] Rheumatoid Arthritis has also marked impact on patients' QOL, affecting both psychological and physical domains of health.[3]

The World Health Organization (WHO) defines Quality of life as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns".[4] WHO QOL-BREF is a brief version of the original questionnaire, and is more appropriate to apply in clinical studies. It includes questions about physical health, psychological health, social relationship and environmental factors.[5] It has appropriate psychometric properties in rheumatoid arthritis patients and represents a valid outcome measure for interventions that intend to improve the quality of life.[6] It is reliable and valid cross culturally for assessment of quality of life.[7] Despite similar levels of disease activity and severity, researchers have observed individual variations in health related QOL. Therefore, in addition to medical treatment, other factors are also needed to improve outcome. Social support, for example, has a considerable impact on quality of life[8] and previous clinical studies also shown that social support has positive effects on rheumatoid arthritis patients.[9,10] Goma SH *et al* reported that all domains of WHO QOL-BREF had significant negative correlation with disease activity.[11] Another study conducted by Haroon *et al* showed similar results that rheumatoid arthritis patients had significantly lower QOL as compared to the general population.[12]

Besides increasing life expectancy the ultimate goal of medical care should also be to improve patients' QOL. The management outcome target is usually to reduce disease activity. However, in chronic diseases like rheumatoid arthritis QOL is an important outcome measure that should be addressed. Limited evidence is available from Pakistan to highlight the holistic approach towards patient care. The rationale of this study was to assess QOL in female rheumatoid arthritis patients and its relationship with activity of disease.

Methods:

It was a cross sectional analytical study with 140 rheumatoid arthritis patients that recruited through convenient sampling from October 2018 to January 2019 from the Rheumatology out-patient department of Shaikh Zayed Hospital, Lahore. Inclusion criteria were all females aged 18-50 years diagnosed with rheumatoid arthritis for more than 6 months duration according to the 2010 diagnostic criteria of The American College of Rheumatology/European League against Rheumatism.[13] The patients with other known comorbids (diabetes, hypertension, ischemic heart disease, psychiatric illness or any other conective tissue disease) were excluded. The sample size of 140 had 98% power at 95% confidence level, with expected cumulative $R^2 = 0.19$ taking 10 predictors in consideration for QOL-social.[14]

The questionnaire was comprised of three parts including two measurement tools to assess the outcomes measures. The first part included demographic information. In the second part activity of disease is assessed by using Disease Activity Score in 28 joints (DAS - 28).[15] It is calculated by using a simple formula that is based on number of tender and swollen synovial joints (0 - 28), erythrocyte sedimentation rate (ESR) and the patient global health assessment (from 0 = best to 10 = worst). The interpretation of score is: 0 to < 2.6 is considered as remission, score in between 2.6 to < 3.2 is low disease activity, score in between 3.2 to ≤ 5.1 considered as moderate disease activity and > 5.1 score correspond with high disease activity. The third part is to evaluate QOL by using the standard WHOQOL-BREF questionnaire. The Urdu version of WHOQOL-BREF is reliable and valid for use in Pakistani population.[16,17] The questionnaire was filled by a patient in a separate room to maintain privacy but those patients who did not have basic education were helped by a doctor. WHOQOL-BREF comprised of 26 items and measures the four domains of life over the last two weeks: physical health that include daily activities, dependence, energy, pain, sleep and work capability; psychological health that include body image, positive and negative thoughts, self esteem, personal and religious belief, thinking, learning, memory and concentration; social relationship that include personal and sexual relationship along with social support and environmental factors that include financial status, freedom, physical environment, transport, health and social care.

Data was entered and analyzed by using SPSS version 20.0. Data for age, Body Mass Index (BMI), duration of illness, education years, DAS-28, and various health factors of Quality of life scores were

presented by using mean ± SD. All qualitative features and categories were presented by frequency and percentages. The effect of different sociodemo-graphic factors and disease activity score on various QOL scores was determined by using linear reg-ression analysis with backward removal method with criteria of p-value 0.10. P-value ≤ 0.05 was considered statistically significant.

Results:

The average age of these female patients was 36.4 ± 5.4 years with majority (56.4%) in age group 31 – 40 years. Among these 49.3% were overweight and 21.4% obese. Education was not of very high level, only 15.7% were graduates while 16.4% were uneducated. Only 7.1% were separated, divorced or widowed while all others were married and 80.7% of them were unemployed or housewives. (Table.1)

Table 1: *Socio-demographical characteristics of rheumatoid arthritis patients*

		N	%
Age of patient	Mean ± SD	36.4 ± 5.4	
	≤ 30	30	21.4
	31 – 40	79	56.4
	> 40	31	22.1
BMI	Mean ± SD	27.3 ± 3.2	
	Healthy	41	29.3
	Overweight	69	49.3
	Obese	30	21.4
Education of patient	Uneducated	23	16.4
	Under-matric	24	17.1
	Matric	35	25.0
	Intermediate	36	25.7
	Graduation	22	15.7
Marital status	Married	130	92.9
	Separated	2	1.4
	Divorced	3	2.1
	Widowed	5	3.6
Employment status	Employed	27	19.3
	Non-employed	113	80.7

Mean duration of illness was 4.8 ± 2.4 years with only 2.9% having duration more than 10 years. The

DAS-28 had a mean value of 2.9 ± 0.7 with 39.3% of the patient in remission. (Table.2)

Table 2: *Disease duration and activity score for study participants*

		N	%
Duration of illness (years)	Mean ± SD	4.8	2.4
	< 5	67	47.9
	5-10	69	49.3
	> 10	4	2.9
Disease Activity score DAS 28	Mean ± SD	2.9	0.7
	Remission	55	39.3
	Low	46	32.9
	Moderate	38	27.1
	High	1	0.7

All mean health scores with standard deviations are given in Table.3. The WHOQOL-BREF on 0 – 100 scale for physical health was lowest, while environmental health was highest with a median of 59(55 – 64). Social health also had the same median with interquartile range of (46 – 69). (Figure-1)
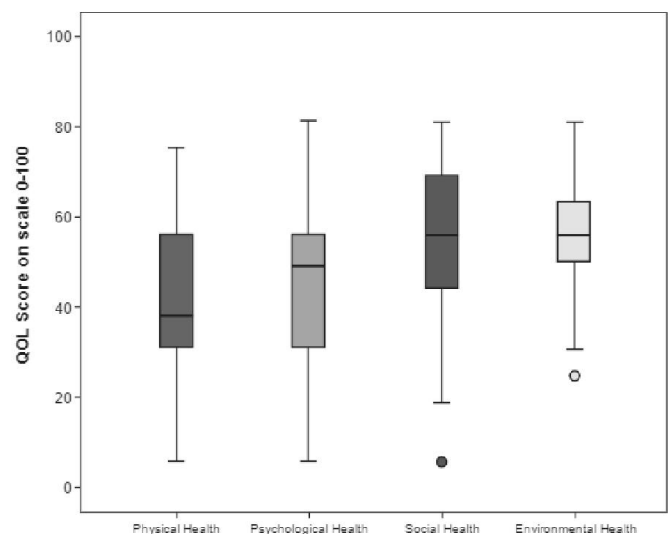

Figure 1: *Distribution of different health factors scores on scale 0 – 100*

From regression analysis, the age and BMI did not play any significant role in any of the quality of life factor scores. Duration of illness had a significant role with p-value of 0.021 on environmental health with an average increase of 0.82 with every passing year of disease. The disease activity score had a highly significant negative effect with p-value < 0.001 on each health factor with different coefficients. For each unit increase of DAS the physical health score

was reduced by 15.23 on average while this reduction was 12.31 for psychological, 12.44 for social and 4.81 for environmental health. To be married had no significant effect on physical health but had a highly significant effect with 25.2, 31.09 and 14.80 unit increase in psychological, social and environmental health (p-values < 0.001). Different education levels had different positive effects on the score when compared with uneducated status. To be literate (just under matric) had a significant effect on psychological and social health. Ten years of school education had a significant effect on psychological, although insignificant on physical and social health with p-values 0.097 and 0.070 respectively. Having twelve-year education had a significant positive effect on social health, while having graduation or higher education had a significant positive effect on three health factors except for physical health. Those who were employed had, on average, 7.29 units higher in physical health as compared to unemployed with a p-value 0.008. (Table-4)

Table 3: *QOL scores on Raw scale and standardized on 4 − 20 and 0 − 100 scale.*

QOL Score Scale		Mean	Standard Deviation
Raw score	Physical	18.1	4.7
	Psychological	17.2	4.2
	Social	9.4	2.3
	Environmental	25.6	3.5
QOL 4 − 20	Physical	10.4	2.7
	Psychological	11.5	2.8
	Social	12.6	3.0
	Environmental	13.0	1.8
QOL 0 − 100	Physical	40.1	16.8
	Psychological	46.9	17.6
	Social	53.6	18.8
	Environmental	56.6	11.1

Table 4: *Effect of various Sociodemographic and disease factors on Physical, Psychological, Social and Environmental Health score of Rheumatoid Arthritis patients*

	Physical $R^2 = 0.456$		Psychological $R^2 = 0.389$		Social $R^2 = 0.400$		Environmental $R^2 = 0.226$	
	Reg. coefficient	P-value	Reg. coefficient	P-value	Reg. coefficient	P-value	Reg. coefficient	P-value
(Constant)	82.03	< 0.001	54.81	< 0.001	52.16	< 0.001	52.06	< 0.001
Age of patient	--	--	--	--	--	--	--	--
BMI kg/m2	--	--	--	--	--	--	--	--
Duration of illness in years	--	--	--	--	--	--	0.82	0.021
Disease Activity score	-15.23	< 0.001	-12.31	< 0.001	-12.44	< 0.001	-4.81	< 0.001
Marital status	--	--	25.20	< 0.001	31.09	< 0.001	14.80	< 0.001
Under Matric	--	--	7.81	0.024	17.12	< 0.001	--	--
Matric	4.12	0.097	6.15	0.039	7.19	0.070	--	--
Intermediate	--	--	--	--	7.89	0.045	--	--
Graduation +	--	--	11.11	0.002	13.66	0.002	5.45	0.021
Employment status	7.29	0.008	--	--	--	--	--	--

Discussion:

Rheumatoid arthritis had a negative impact on patients' life and affects all domains of quality of life. This study objective was to determine QOL and its relationship with sociodemographic factors and activity of disease in female rheumatoid arthritis patients.

In this study, 140 female rheumatoid arthritis patients participated. The findings of this study revealed that rheumatoid arthritis affects every domain of quality

of life but the score for physical health was the lowest while for environmental and social health was highest among all. These findings were consistent with other studies that rheumatoid arthritis affects physical health the most. Bedi *et al* reported similar lowest score in the physical domain and comparatively high scores in social and environmental health in Indian patients with rheumatoid arthritis.[18] These comparatively better results in social and environmental health may be due to the combined family system and good social support in our region. In a study conducted by Faiq *et al* results showed that of all the domains of QOL affected, the physical health was affected most and despite the physical limitation, social relationship domains had higher scores.[14] Results of systematic review and meta-analysis concluded that in early stage of rheumatoid arthritis, all physical domains were lesser than the general population while the mental health domain was similar to the general population. In the late stage of rheumatoid arthritis, both physical and mental health domains were lower than the general population.[19]

Disease activity had a highly significant negative effect on each health factor domain such that with each unit increase in DAS, there is a significant reduction in each health domain of WHOQOL-BREF domains. Similar results reported by Munchey *et al* which showed significantly worse QOL and functional ability in active rheumatoid arthritis patients compared to those with inactive disease.[20] Gamel *et al* reported that disease activity significa-ntly affects both physical and psychological domains of QOL in Egyptian rheumatoid arthritis patients.[21] Bedi *et al* reported a negative correlation of disease activity with physical and psychological domains, but no correlation was found between social and environmental health domains.[17]

The results of this study showed that age and BMI had insignificant role in any of the domains of WHOQOL-BREF. The marital status had insignificant effect on physical health score but highly significant positive effect on psychological, social and environmental health. Employed patients had higher physical health scores compared to unemployed patients. Diana *et al* concluded that old age and employed patients had better health scores.[22] Molina *et al* reported that poor socioeconomic status associated with delay in accessing health facilities leading to delay in treatment.[23] The better quality of life scores

in employed females may be due to financial independence as well as maintenance of their well being and less time for negative thoughts.

Education had a significant positive effect on psychological and social health. Faiq *et al* concluded that education level was directly related to all four health domains of WHOQOL-BREF.[18] Lack of education leads to lack of understanding of disease and inadequate self management.[24]

Duration of illness had a significant positive correlation on environmental health. Munchey *et al* concluded that health scores were significantly better with decreased disease duration.[20] Yaqoob *et al* studied the disease related parameters affecting QOL in rheumatoid arthritis patients and found that duration of disease, disease activity, pain intensity and functional disability were the major determinants associated with disruption of quality of life.[25] Greater level of disease acceptance seen in patients experiencing symptoms for a prolong duration than patients with new onset disease. Although this is yet to be established in rheumatoid arthritis patients, clinical studies in other chronic inflammatory conditions have found a significant association between prolonged duration of disease and increased acceptance of disease.

This study helps in improving holistic approach towards patients. Rheumatoid arthritis patients required a multidisciplinary approach in management as well as good family and social support to cope with the disease.

This is a cross-sectional study, so more Prospective studies to come up filing the research gaps. Other confounding factors like anxiety and depression were not assessed in this study that in chronic disease could have an impact on patients' QOL.

Conclusion:

Rheumatoid arthritis affects every domain of quality of life but physical health is affected most. Education, being married and employed had a positive effect while disease activity had a negative effect on all domains of quality of life.

References:

1. Palferman TG. Principles of rheumatoid arthritis control. J Rheumatol Suppl. 2003; 67(12):10-13.

2. Stenstrom CH, Nisell R. Assessment of disease consequences in rheumatoid arthritis: A survey of methods classified according to International Classification of impairment, disabilities and handicaps. Arthritis Rheumatol.1997;10(2)135-150.

3. Uhlig T, Loge JH, Kristiansen IS, Kvien TK. Quantification of reduced health-related quality of life in patients with rheumatoid arthritis compared to the general population. J Rheumatol. 2007; 34(6):241-7.

4. WHO QOL Group. Study protocol for the World Health Organization project to develop a Quality of life assessment instrument (WHOQOL). Qual Life Res. 1993;2(2):153-9.

5. Dragomirecka E, Bartonova J. The World Health Organization quality of life assessment WHOQOL-BREF. Psychometric properties and first experience with Czech version. Psychiatrie Praha. 2006; 10(3):144.

6. Taylor WJ, Myers J, Simpson RT, McPherson KM, Weatherall M. Quality of life of people with rheumatoid arthritis as measured by the World Health Organization Quality of Life instrument, short form (WHOQOL-BREF): score distributions and psychometric properties. Arthritis Rheum. 2004;51(3) : 350-7.

7. Skevington SM, Lotfy M, O' Connell KA. The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL Group. Qual Life Res. 2004; 13(4):299-310.

8. Helgeson VS. Social support and quality of life. Qual Life Res. 2003;12(1):25-31.

9. Minnock P, Fitzgerald O, Bresnihan B. Quality of life, social support, and knowledge of disease in women with rheumatoid arthritis. Arthritis Rheum. 2003;49(2):221-7.

10. Strating MMH, Suurmeijer TP, van Schuur WH. Disability, social support, and distress in rheumatoid arthritis: results from a thirteen-year prospective study. Arthritis Rheum. 2006;55(5):736-44.

11. Goma SH, Razek MR, Abdelbary NM. Impact of rheumatoid arthritis on the quality of life and its relation to disease activity. Egypt Rheumatol Rehabil. 2019;46(4):304-312.

12. Haroon N, Aggarwall A, Lawrence VA, Misra R. Impact of rheumatoid arthritis on quality of life. Mod Rheumatol. 2007;17(4):290-5.

13. Aletaha D, Neogi T, Silman AJ, Funovits J, Felson DT, Bingham CO, et al. 2010 Rheumatoid Arthritis Classification Criteria: an American College of Rheumatology / European League Against Rheumatism collaborative initiative. Arthritis Rheum. 2010;62(9):2569-81.

14. Faiq MK, Khadim DJ, Gorial FI. Assessing quality of life among sample of Iraqi patients with rheumatoid arthritis. Int J Res Pharm Sci. 2019;10 (4): 2856-63.

15. Prevoo ML, Van't Hoff MA, Kuper HH, Van Leeuwen MA, Van de Putte LB, Van Riel PL. Modified disease activity scores that include twenty-eight-joint counts. Development and validation in a prospective longitudinal study of patients with rheumatoid arthritis. Arthritis Rheum. 1995;38(1) :44-8.

16. Khan MNS, Akhter MS, Ayub M, Laghari NU. Translation and validation of Quality of life scale, the brief version. J Coll Physici. 2003;13(2):98-100.

17. Lodhi FS, Raza O, MontazeriA, Nedjat S,Yaseri M, Naieni KH. Psycometric properties of the Urdu version of the World Health Organization's quality of life questionnaire (WHOQOL-BREF). Med J Islam Repub Iran. 2017;31(6):129.

18. Bedi GS, Gupta N, Handa R, Pal H, Pandey RM. Quality of life in Indian patients with rheumatoid arthritis. Qual Life Res. 2005;14(18):1953-58.

19. Matcham F, Scott IC, Rayner L, Hotopf M, Kingsley GH, Norton S, et al. The impact of rheumatoid arthritis on quality of life assessed using SF-3: A systematic review and meta-analysis. Semin Arhritis Rheu. 2014;44(2):123-30.

20. Munchey R, Pharm M, Pongmesa T. Health related quality of life and functional ability of patients with rheumatoid arthritis: A study from a Tertiary care hospital in Thialand. Value Health Reg issues. 2018 ;15(3):76-81.

21. Gamal RM, Mahran SA, Abo El Fetoh N, Janbi F. Quality of life assessment in Egyptian rheumatoid arthritis patients: Relation to clinical features and disease activity. Egypt Rheumatol. 2016;38(2):65-70.

22. Rosa Goncalves D, Bernardes M, Costa L. Quality of life and functional capacity in patients with rheumatoid arthritis Cross-sectional study. Rheumatol Clin.2018;14(6):360-6.

23. Molina E, del Rincon I, Restrepo JF, Battafarano DF, Escalante A. Association of socioeconomic status with treatment delays, disease activity, joint

damage, and disability in rheumatoid arthritis. Arthritis Care Res. 2015;67(7):940-6.

24. Wills J. Health Literacy: new packaging for health education or radical movement? Int J Public Health. 2009;54(1):3-4.

25. Ibn Yacooub Y, Amine B, Laatiris A, Hajjaj-Hassouni N. Health related quality of life in Moroccan patients with rheumatoid arthritis. Clin Rheumatol. 2012;31(5):1471-7.