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# The Quality of Life in Patients with Rheumatoid Arthritis in Baghdad, 2017: A Cross-Sectional Study

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## ABSTRACT

***Background:*** *Rheumatoid arthritis is a chronic, multisystem autoimmune and inflammatory disease, which can result in significant functional disability and depressive symptoms. These changes may have a negative influence on the performance of daily living and work activities, with consequent impact on the quality of life.* ***Aims of study:*** *To assess quality of life in patients with rheumatoid arthritis and finding out the association between sociodemographic variables with physical and mental components of quality of life domains.* ***Methodology:*** *This was a descriptive cross-sectional study carried out in rheumatology consultation clinic at Baghdad Teaching Hospital-Medical City during a period from February 01, 2017 to April 01, 2017 on convenient sample of 156 patients with rheumatoid arthritis.* ***Results:*** *The role functioning/physical domain had the highest mean score for quality of life (53.78). Pain domains mean score was the lowest (44.57). There was a significant association between mean quality of life domains and each of educational level, blood pressure state, marital status, monthly income, duration of treatment, source of treatment, and type of treatment. There was a significant association between residence ownership and social functioning domain.* ***Conclusion:*** *The quality of life in rheumatoid arthritis patients was high regarding role limitations due to physical problems, role limitation/emotional and the quality of life was affected by educational level, blood pressure, age group, marital status, residence, monthly income, duration of disease, type of treatment.*

**Keywords:** Quality of life, Rheumatoid arthritis, Baghdad

## INTRODUCTION

Health is a state of complete physical, mental, and social well-being and not just the absence of disease and infirmity [1].

Ever since this definition given by the World Health Organization in 1948 there has been a major emphasis on the impact of diseases on the quality of life (QoL) of patients. Like the various disease activity measures, an equal number of measures have been developed to measure the QoL of patients suffering from various diseases.

According to the WHO, QoL is defined as "the 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." [2].

Rheumatoid arthritis (RA) is a chronic, multisystem autoimmune and inflammatory disease, which can result in significant functional disability [3,4] and depressive symptoms [5,6]. These changes may have a negative influence on the performance of daily living and work activities, with consequent impact on the quality of life (QoL) [7].

Although the disease occurs in both genders, whether it is expressed differently in women and men has been scarcely studied; moreover, the published studies have been primarily focused on the biological aspects of the disease including immunological characteristics, inflammatory markers and/or radiographic damage. It affects all age groups, but is more prevalent among 40-60-year people [8,9].

It has a prevalence ranging between 0.5% and 1% with an annual incidence of 3 per 10,000 adults. The prevalence of rheumatoid arthritis is between 0.5% to 1% in European and North American populations, Asia had the lower rate of disease (0.2-0.3). Some Native American populations had a remarkably high prevalence more than (5%) [10].

The prevalence of rheumatoid arthritis in the Sultanate of Oman, adjusted for the population structure, was 8.4 per thousand adults [11].

In Iraq, the incidence for rheumatoid arthritis was done during the period 2001-2011 in persons aged 16 and over, definite Rheumatoid arthritis was observed in 3.02% in 2011 in Babylon province [12].

Studies evaluating the impact of RA on QoL showed that these patients have significantly lower levels of QoL when compared with the general population [13,14], and lower functional capacity scores when compared to other chronic diseases [15,16]. Other studies have also shown that changes in QoL can be seen even in the earliest stages of the disease progression [17].

Among the factors that could directly affect the reduction of QoL in patients with RA, depression deserves special attention [5,18]. Sharpe, et al. [5] demonstrated a close relationship between depression and the early stages of disability in patients with RA, and also that these patients became more depressed with the evolution of the disease. Costa, et al. [19] and Mella, et al. [20] found that the prevalence of depressive symptoms in patients with RA is of 33.7% and 53.2%, respectively.

The literature also indicates that depression is more common in RA patients than in healthy individuals [21]. Health-related quality of life (HRQoL) refers to the impact of disease and treatment on the individual's welfare. Patients diagnosed with RA have significant decreases in HRQoL, resulting from pain, impaired physical function and fatigue [22]. Generic measures, such as the SF-36 questionnaire, have been frequently used in clinical trials of RA to assess HRQoL [23].

Current treatment for RA includes, such as methotrexate (MTX) and newly developed biological consisting of mainly anti-TNF therapies, including etanercept (Enbrel), infliximab (Remicade), and adalimumab (Humira).

Anti-TNF therapies have demonstrated efficacy in MTX failure, however, a proportion of patients does not benefit from these treatments either due to inadequate response or adverse reactions [24,25].

Along with improvements in signs and symptoms, QoL benefits have become increasingly important in optimizing treatment outcomes in RA. Measurements of QoL have previously been under-used in all areas of medicine and only recently have clinical trials included them as a measure of treatment effectiveness. The existence of a positive relationship between improvements in signs and symptoms and concomitant improvements in QoL provides additional evidence that QoL measures are useful benchmarks for evaluating the effectiveness of treatment for RA [26].

**Aims of study**

- To assess quality of life in patients with rheumatoid arthritis (RA).
- To find out the association between sociodemographic variables with Physical, and mental Components of QoL.
- To compare the QoL domains regarding different types of treatment.

**Patients and Methods**

**Study design and duration of data collection**

This is a descriptive cross-sectional study with analytic elements, Data collection was carried out during a period of time extended from working hours.

**Setting**

The study was conducted in Baghdad, capital city of Iraq in rheumatology consultation clinic at Baghdad Teaching Hospital-Medical City, in Al-Rusafa district.

**Study population and sampling procedure**

**Inclusion criteria**

The sample included rheumatoid arthritis patients (diagnosed by authorized rheumatologist) attending the rheumatology clinic seeking for regular treatment and follow up. The questionnaire was distributed to those patients who met the inclusion criteria and 152 questionnaires were recollected from those patients.

**Exclusion criteria**

Rheumatoid arthritis being less than one year.

**Tool of data collection**

Data was collected by self-administered questionnaire consisting of two parts:

**Part I**

This part of the questionnaire designed by the researchers and approved by the supervisor and panel of experts in Family and Community Medicine department in Al-Kindy college of Medicine.

Demographic information include age, education, occupation, marital status. Socio-economic status include residence, monthly income (<500000 considered poor, 500000-1000000 considered fair, >1000000 considered as good).

Information regarding commodities (at least one chronic disease), type of treatment (tablet, injections, or both), duration of treatment (less than 5. 5-10 and more than 10 years) and source of treatment (free from the hospital, from market or both).

**Part II**

Assessment of quality of life was conducted with the use of general questionnaire of quality of life: Short Form 36 (SF-36). It is one of the most common tools for determining quality of life of various groups of patients and general population. The questionnaire consists of 36 items which are used to analyse two dimensions of quality of life:

- Physical Component Summary (PCS) and
- Mental (Mental Component Summary (MCS).

Quality of life in physical dimension (Physical Component Summary, PCS) consists of four sub scales: physical functioning (PF), role limitations due to physical problems (RP), bodily pain (BP), general health perception (GH). Quality of life in mental dimension (Mental Component Summary, MCS) also contains four sub scales: vitality (VT), social functioning (SF), role limitation due to emotional problems (RE), assessment of one's own mental health (MH). The scale contains scoring 0-100 in each category, the number of points, the worse quality of life (27).

**Statistical analysis**

Microsoft excel 2003, SPSS. Version 22 were used for statistical analysis. Frequency distribution, mean and standard deviation tables were used for displaying descriptive statistics. Scoring of different domains of HRQOL was done according to Scoring the RAND 36-Item Health Survey which is of two-step process.

First, precoded numeric values are recoded per the scoring key given in Table 1. Note that all items are scored so that a high score defines a more favourable health state. In addition, each item is scored on a 0 to 100 range so that the lowest and highest possible scores are 0 and 100, respectively. Scores represent the percentage of total possible score achieved.

**Table 1 Recoding items**

| Item numbers | Change original response category* | To recoded value of |
|---|---|---|
| 1, 2, 20, 22, 34, 36 | 1 → | 100 |
| | 2 → | 75 |
| | 3 → | 50 |
| | 4 → | 25 |
| | 5 → | 0 |
| 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 | 1 → | 0 |
| | 2 → | 50 |
| | 3 → | 100 |
| 13, 14, 15, 16, 17, 18, 19 | 1 → | 0 |
| | 2 → | 100 |
| 21, 23, 26, 27, 30 | 1 → | 100 |
| | 2 → | 80 |
| | 3 → | 60 |
| | 4 → | 40 |
| | 5 → | 20 |
| | 6 → | 0 |
| 24, 25, 28, 29, 31 | 1 → | 0 |
| | 2 → | 20 |
| | 3 → | 40 |
| | 4 → | 60 |
| | 5 → | 80 |
| | 6 → | 100 |
| 32, 33, 35 | 1 → | 0 |
| | 2 → | 25 |
| | 3 → | 50 |
| | 4 → | 75 |
| | 5 → | 100 |

In step 2, items in the same scale are averaged together to create the 8 scale scores. Table 2 lists the items averaged together to create each scale. Hence, scale scores represent the average for all items in the scale that the respondent answered.

**Table 2 Averaging items to form scales**

| Scale | Number of items | After recoding as per Table 1, average the following items |
|---|---|---|
| Physical functioning | 10 | 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 |
| Role limitations due to physical health | 4 | 13, 14, 15, 16 |
| Role limitations due to emotional problems | 3 | 17, 18, 19 |
| Energy/fatigue | 4 | 23, 27, 29, 31 |
| Emotional well-being | 5 | 24, 25, 26, 28, 30 |
| Social functioning | 2 | 20, 32 |
| Pain | 2 | 21, 22 |
| General health | 5 | 1, 33, 34, 35, 36 |

Shapiro-Wilk test shows that the data in all domains were not normally distributed so non-parametric tests (Mann-Whitney u test and Kruskal-Wallis H Test) were used to find out differences in central tendency measures among related variables, $P<0.05$ was considered as significant.

## RESULTS

The total study sample collected from Rheumatoid arthritis patients attending the rheumatology clinic seeking for regular treatment and follow up. Table 3 describes the demographic characters of the sample recruited in the study. It shows that 47.4% of the sample were less than 50 years old, 82% were female. About 72.37% of studied sample were

married. Regarding education 55.9% were primary level of education. About 78.3% were employed, 51% of studied sample had monthly income between 500000-1000000 ID). For residence ownership, 71.1% had Personal property.

**Table 3 Distribution of studied sample according to socio-demographic characteristics**

| Variables | | No. | % |
|---|---|---|---|
| Age group | <50 year | 72 | 47.4 |
| | ≥50 year | 80 | 52.6 |
| Gender | Male | 26 | 17.1 |
| | Female | 126 | 82.9 |
| Marital state | Single | 21 | 13.82 |
| | Married | 110 | 72.37 |
| | Widowed | 11 | 7.24 |
| | Divorced | 10 | 6.58 |
| Education | Primary | 85 | 55.9 |
| | Secondary | 42 | 27.6 |
| | University | 25 | 16.4 |
| Job | Employee | 119 | 78.3 |
| | Not employee | 33 | 21.7 |
| Income | Poor (<500000) | 39 | 25.8 |
| | Fair (500000-1000000) | 77 | 51 |
| | Good (>1000000) | 36 | 23.2 |
| Residence ownership | Rented | 44 | 28.9 |
| | Personal property | 108 | 71.1 |
| Duration of disease | <5 years | 51 | 33.6 |
| | 05-10 | 52 | 34.2 |
| | >10 years | 49 | 32.2 |
| Source of treatment | Hospital | 30 | 19.7 |
| | Market | 37 | 24.3 |
| | Both | 85 | 55.9 |
| Type of treatment | Traditional | 34 | 22.4 |
| | Biological | 32 | 21.1 |
| | Both | 86 | 56.6 |

Around 34.2% had disease duration between 5-10 years, 33.6% less than 5 years, and 32.2% more than 10 years.

Regarding source of treatment, 55.9% they got the treatment from both hospital and market. About 56.6% of rheumatoid arthritis patients use both traditional and biological treatment, while 22.4% use traditional and 21.1% used biological only.

Table 4 illustrates that the calculated domains scores. Role functioning/physical domain had the highest mean score for QoL 53.78 with SD of 45.923 and median of 75. General health perception and bodily pain domains were the lowest score with median of 45 for both.

**Table 4 Calculated QoL domain scores**

| Variables | No. | Mean | SD | Median |
|---|---|---|---|---|
| **Physical Component Summary, PCS** | | | | |
| Physical functioning | 152 | 48.26 | 29.874 | 50 |
| Role limitations due to physical problems (RP) | 152 | 53.78 | 45.923 | 75 |
| Bodily pain (BP) | 152 | 44.57 | 23.984 | 45 |
| General health perception (GH) | 152 | 45.86 | 17.556 | 45 |
| **Mental Component Summary** | | | | |
| Role limitation/emotional | 152 | 51.32 | 47.433 | 66.67 |
| Energy/fatigue | 152 | 51.78 | 25.904 | 50 |
| Assessment of one's own mental health (MH) | 152 | 50.66 | 26.332 | 56 |
| Social functioning | 152 | 53.04 | 26.759 | 50 |

Table 5 shows that there is a statistical significant association between physical functioning, role limitations due to physical problems (RP), bodily pain regarding PCS. And between role limitation/emotional and social functioning domains in MCS and type of treatment.

**Table 5 Association between type of treatment and QoL domain**

| Physical Component Summary, PCS | | Traditional | | Biological | | Both | | p-value |
|---|---|---|---|---|---|---|---|---|
| | | N | % | N | % | N | % | |
| Physical functioning | > Median | 21 | 28.38 | 21 | 28.38 | 32 | 43.24 | 0.005 |
| | ≤ Median | 13 | 16.67 | 11 | 14.1 | 54 | 69.23 | |
| Role limitations due to physical problems (RP) | > Median | 23 | 34.85 | 14 | 21.21 | 29 | 43.94 | 0.003 |
| | ≤ Median | 11 | 12.79 | 18 | 20.93 | 57 | 66.28 | |
| Bodily pain (BP) | > Median | 19 | 28.36 | 18 | 26.87 | 30 | 44.78 | 0.033 |
| | ≤ Median | 15 | 17.65 | 14 | 16.47 | 56 | 65.88 | |
| General health perception (GH) | > Median | 19 | 26.76 | 16 | 22.54 | 36 | 50.7 | 0.35 |
| | ≤ Median | 15 | 18.52 | 16 | 19.75 | 50 | 61.73 | |
| **Mental Component Summary** | | | | | | | | |
| Role limitation/emotional | > Median | 24 | 35.29 | 14 | 20.59 | 30 | 44.12 | 0.002 |
| | ≤ Median | 10 | 11.9 | 18 | 21.43 | 56 | 66.67 | |
| Energy/fatigue | > Median | 16 | 24.24 | 9 | 13.64 | 41 | 62.12 | 0.145 |
| | ≤ Median | 18 | 20.93 | 23 | 26.74 | 45 | 52.33 | |
| Assessment of one's own mental health (MH) | > Median | 15 | 21.43 | 10 | 14.29 | 45 | 64.29 | 0.12 |
| | ≤ Median | 19 | 23.17 | 22 | 26.83 | 41 | 50 | |
| Social functioning | > Median | 22 | 30.99 | 18 | 25.35 | 31 | 43.66 | 0.009 |
| | ≤ Median | 12 | 14.81 | 14 | 17.28 | 55 | 67.9 | |

In Table 6, there is a statistical significant association between mean QoL domains and educational level. Regarding

pairwise comparisons between primary and secondary levels, there is a statistical significant association in all domains, while between primary and university level of education in all QoL domains, there is a statistical significant association except for general health domain. While there is no statistical significant association between secondary and university level of education in all QoL domains.

**Table 6 The mean QoL domain rank by educational level of studied sample**

| Ranks | | | | K-W test Sig | Pairwise comparisons sig. | | |
|---|---|---|---|---|---|---|---|
| Scale | Education | N | Mean Rank | | 1&2 | 1&3 | 2&3 |
| Physical functioning | Primary | 85 | 63.76 | <0.001 | 0.001 | 0.001 | 0.467 |
| | Secondary | 42 | 89.96 | | | | |
| | University | 25 | 97.18 | | | | |
| Role limitation due to physical problems | Primary | 85 | 67.39 | 0.007 | 0.015 | 0.018 | 0.681 |
| | Secondary | 42 | 85.71 | | | | |
| | University | 25 | 92 | | | | |
| Role limitation/emotional | Primary | 85 | 67.85 | <0.001 | 0.002 | 0.002 | 0.608 |
| | Secondary | 42 | 86.14 | | | | |
| | University | 25 | 89.7 | | | | |
| Energy/fatigue | Primary | 85 | 62.89 | <0.001 | 0.019 | 0.008 | 0.588 |
| | Secondary | 42 | 89.19 | | | | |
| | University | 25 | 101.46 | | | | |
| Assessment of one's own mental health | Primary | 85 | 64.54 | 0.001 | 0.002 | <0.001 | 0.409 |
| | Secondary | 42 | 89.65 | | | | |
| | University | 25 | 95.06 | | | | |
| Social functioning | Primary | 85 | 64.51 | 0.001 | 0.004 | 0.001 | 0.555 |
| | Secondary | 42 | 88.7 | | | | |
| | University | 25 | 96.78 | | | | |
| Bodily Pain | Primary | 85 | 65.57 | 0.001 | 0.02 | 0.001 | 0.378 |
| | Secondary | 42 | 85.62 | | | | |
| | University | 25 | 98.34 | | | | |
| General health perception | Primary | 85 | 66.97 | 0.006 | 0.002 | 0.139 | 0.244 |
| | Secondary | 42 | 93 | | | | |
| | University | 25 | 81.18 | | | | |

In Table 7 there is no statistical significant association between gender and mean QoL domains.

**Table 7 The mean QoL domain rank by gender of studied sample**

| Ranks | | | | | P-value |
|---|---|---|---|---|---|
| Scale | Gender | N | Mean Rank | Sum of Ranks | |
| Physical functioning | Male | 26 | 76.17 | 1980.5 | 0.967 |
| | Female | 126 | 76.57 | 9647.5 | |
| Role limitation due to physical problems | Male | 26 | 82.73 | 2151 | 0.384 |
| | Female | 126 | 75.21 | 9477 | |
| Role limitation/emotional | Male | 26 | 90.83 | 2361.5 | 0.068 |
| | Female | 126 | 73.54 | 9266.5 | |
| Energy/fatigue | Male | 26 | 81 | 2106 | 0.537 |
| | Female | 126 | 75.57 | 9522 | |
| Assessment of one's own mental health | Male | 26 | 86.13 | 2239.5 | 0.219 |
| | Female | 126 | 74.51 | 9388.5 | |
| Social functioning | Male | 26 | 68.63 | 1784.5 | 0.313 |
| | Female | 126 | 78.12 | 9843.5 | |
| Bodily Pain | Male | 26 | 75.37 | 1959.5 | 0.885 |
| | Female | 126 | 76.73 | 9668.5 | |
| General health perception | Male | 26 | 79.98 | 2079.5 | 0.667 |
| | Female | 126 | 75.78 | 9548.5 | |

Table 8 shows there is a statistical significant association between mean QoL domain (physical functioning (P=0.039), role functioning/physical (P=0.039), energy/fatigue (P=0.037) and age group.

**Table 8 The mean QoL domain rank by age group of studied samples**

| Ranks | | | | | P-value |
|---|---|---|---|---|---|
| **Scale** | **Age group** | **N** | **Mean Rank** | **Sum of Ranks** | |
| Physical functioning | <50years | 72 | 84.27 | 6067.5 | 0.039 |
| | ≥50years | 80 | 69.51 | 5560.5 | |
| Role limitation due to physical problems | <50years | 72 | 83.56 | 6016 | 0.039 |
| | ≥50years | 80 | 70.15 | 5612 | |
| Role limitation/emotional | <50years | 72 | 83.84 | 6036.5 | 0.05 |
| | ≥50years | 80 | 69.89 | 5591.5 | |
| Energy/fatigue | <50years | 72 | 83.78 | 6032.5 | 0.037 |
| | ≥50years | 80 | 69.94 | 5595.5 | |
| Assessment of one's own mental health | <50years | 72 | 82.38 | 5931 | 0.118 |
| | ≥50years | 80 | 71.21 | 5697 | |
| Social functioning | <50years | 72 | 73.08 | 5262 | 0.36 |
| | ≥50years | 80 | 79.58 | 6366 | |
| Pain | <50years | 72 | 81.19 | 5845.5 | 0.21 |
| | ≥50years | 80 | 72.28 | 5782.5 | |
| General health | <50years | 72 | 82.18 | 5917 | 0.13 |
| | ≥50years | 80 | 71.39 | 5711 | |

Table 9 shows there is a statistical significant association between mean QoL domains, physical functioning (P=0.014), role functioning/physical (P=0.001), role functioning/emotional (P=0.003), energy/fatigue, emotional well-being (P=0.012), and pain (P=0.007) and marital status (P=0.036).

**Table 9 The mean QoL Domain rank by marital status of studied sample**

| Scale | Marital state | N | Mean Rank | P-value | 1&2 | 1&3 | 1&4 | 2&3 | 2&4 | 3&4 |
|---|---|---|---|---|---|---|---|---|---|---|
| Physical functioning | Single | 21 | 85.76 | 0.014 | 0.686 | 0.001 | 0.019 | 0.021 | 0.043 | 0.972 |
| | Married | 110 | 80.19 | | | | | | | |
| | Divorced | 11 | 46.27 | | | | | | | |
| | Widowed | 10 | 49.75 | | | | | | | |
| Role limitation due to physical problems | Single | 21 | 94.95 | <0.001 | 0.051 | 0.003 | 0.007 | 0.022 | 0.038 | 0.918 |
| | Married | 110 | 79.03 | | | | | | | |
| | Divorced | 11 | 45.86 | | | | | | | |
| | Widowed | 10 | 43.6 | | | | | | | |
| Role limitation/ emotional | Single | 21 | 94.5 | 0.003 | 0.005 | <0.001 | 0.25 | 0.023 | 0.86 | 0.078 |
| | Married | 110 | 78.18 | | | | | | | |
| | Divorced | 11 | 48.95 | | | | | | | |
| | Widowed | 10 | 50.5 | | | | | | | |
| Energy/fatigue | Single | 21 | 103.02 | 0.012 | 0.051 | 0.03 | 0.002 | 0.01 | 0.008 | 1 |
| | Married | 110 | 73.37 | | | | | | | |
| | Divorced | 11 | 54.41 | | | | | | | |
| | Widowed | 10 | 79.5 | | | | | | | |
| Assessment of one's own mental health | Single | 21 | 99.74 | 0.007 | 0.002 | 0.001 | 0.233 | 0.187 | 0.689 | 0.23 |
| | Married | 110 | 75.21 | | | | | | | |
| | Divorced | 11 | 43.59 | | | | | | | |
| | Widowed | 10 | 78.05 | | | | | | | |
| Social functioning | Single | 21 | 70.24 | 0.518 | 0.341 | 0.938 | 0.852 | 0.279 | 0.358 | 0.719 |
| | Married | 110 | 79.71 | | | | | | | |
| | Divorced | 11 | 65 | | | | | | | |
| | Widowed | 10 | 66.95 | | | | | | | |
| Bodily Pain | Single | 21 | 89.55 | 0.036 | 0.233 | 0.067 | 0.01 | 0.171 | 0.027 | 0.372 |
| | Married | 110 | 78.45 | | | | | | | |
| | Divorced | 11 | 59.73 | | | | | | | |
| | Widowed | 10 | 46.05 | | | | | | | |
| General health perception | Single | 21 | 81.33 | 0.66 | 0.515 | 0.289 | 0.787 | 0.248 | 0.898 | 0.478 |
| | Married | 110 | 77.17 | | | | | | | |
| | Divorced | 11 | 61.5 | | | | | | | |
| | Widowed | 10 | 75.5 | | | | | | | |

Table 10 shows there was a statistical significant association between residence ownership and social functioning domain where P=0.017.

**Table 10 The mean QoL Domain rank by residence of studied sample**

| Ranks | | | | | P-value |
|---|---|---|---|---|---|
| **Scale** | **Residence ownership** | **N** | **Mean Rank** | **Sum of Ranks** | |
| Physical functioning | rented | 44 | 68.86 | 3030 | 0.171 |
| | Personal property | 108 | 79.61 | 8598 | |
| Role limitation due to physical problems | rented | 44 | 77.56 | 3412.5 | 0.839 |
| | Personal property | 108 | 76.07 | 8215.5 | |
| Role limitation/emotional | rented | 44 | 77.86 | 3426 | 0.789 |
| | Personal property | 108 | 75.94 | 8202 | |
| Energy/fatigue | rented | 44 | 81.41 | 3582 | 0.379 |
| | Personal property | 108 | 74.5 | 8046 | |
| Assessment of one's own mental health | rented | 44 | 85.58 | 3765.5 | 0.104 |
| | Personal property | 108 | 72.8 | 7862.5 | |
| Social functioning | rented | 44 | 63.28 | 2784.5 | 0.017 |
| | Personal property | 108 | 81.88 | 8843.5 | |
| Pain | rented | 44 | 66.15 | 2910.5 | 0.063 |
| | Personal property | 108 | 80.72 | 8717.5 | |
| General health perception | rented | 44 | 75.51 | 3322.5 | 0.859 |
| | Personal property | 108 | 76.9 | 8305.5 | |

Table 11 shows a statistical significant association between monthly income and mean QoL domains rank (physical functioning, role functioning/physical role functioning/emotional, energy/fatigue, emotional well-being, social functioning, pain domains).

**Table 11 The mean QoL domain rank by income of studied sample**

| Ranks | | | | K-W test | Pairwise comparisons sig. | | |
|---|---|---|---|---|---|---|---|
| **Scale** | **Income** | **N** | **Mean Rank** | **Sig** | **1&2** | **1&3** | **2&3** |
| Physical functioning | low | 39 | 38.83 | <0.001 | <0.001 | <0.001 | 0.412 |
| | fair | 77 | 87.49 | | | | |
| | good | 36 | 93.79 | | | | |
| Role limitation due to physical problems | low | 39 | 45.96 | <0.001 | <0.001 | <0.001 | 0.644 |
| | fair | 77 | 86.12 | | | | |
| | good | 36 | 89 | | | | |
| Role limitation/emotional | low | 39 | 48.88 | <0.001 | <0.001 | <0.001 | 0.621 |
| | fair | 77 | 85.14 | | | | |
| | good | 36 | 87.94 | | | | |
| Energy/fatigue | low | 39 | 67.79 | <0.001 | 0.944 | <0.001 | <0.001 |
| | fair | 77 | 69.07 | | | | |
| | good | 36 | 101.82 | | | | |
| Assessment of one's own mental health | low | 39 | 71.92 | 0.001 | 0.555 | <0.001 | <0.001 |
| | fair | 77 | 67.3 | | | | |
| | good | 36 | 101.14 | | | | |
| Social functioning | low | 39 | 50.1 | <0.001 | <0.001 | <0.001 | 0.409 |
| | fair | 77 | 83.82 | | | | |
| | good | 36 | 89.44 | | | | |
| Bodily Pain | low | 39 | 41.73 | <0.001 | <0.001 | <0.001 | 0.527 |
| | fair | 77 | 86.95 | | | | |
| | good | 36 | 91.81 | | | | |
| General health perception | low | 39 | 80.55 | 0.213 | 0.232 | 0.628 | 0.111 |
| | fair | 77 | 70.51 | | | | |
| | good | 36 | 84.92 | | | | |

Regarding pairwise comparisons, there is a statistical significant association between patients with low income and those with fair income for (physical functioning, role functioning/physical, role functioning/emotional, social functioning, pain).

While there is a statistical significant association between patients with low and good income for all domains except for general health domain where P<0.001 for all.

There is a statistical significant association between patients with fair income and those with good income for (energy/fatigue, emotional well-being) where P<0.001 for both.

Table 12 shows a statistical significant association between duration of disease and mean QoL domains rank (physical functioning, energy/fatigue, emotional well-being, general health domains).

**Table 12 The mean QoL domain rank by duration of disease of studied sample**

| Ranks | | | | K-W test | Pairwise comparisons sig. | | |
|---|---|---|---|---|---|---|---|
| **Scale** | **disease duration** | **N** | **Mean Rank** | **Sig** | **1&2** | **1&3** | **2&3** |
| Physical functioning | <5 year | 51 | 82.45 | 0.038 | 0.958 | 0.041 | 0.017 |
| | 5-9 year | 52 | 83.09 | | | | |
| | ≥ 10 year | 49 | 63.32 | | | | |
| Role limitation due to physical problems | <5 year | 51 | 78.63 | 0.074 | 0.519 | 0.138 | 0.023 |
| | 5-9 year | 52 | 84.26 | | | | |
| | ≥ 10 year | 49 | 66.05 | | | | |
| Role limitation/emotional | <5 year | 51 | 80.89 | 0.092 | 0.919 | 0.07 | 0.048 |
| | 5-9 year | 52 | 81.88 | | | | |
| | ≥ 10 year | 49 | 66.21 | | | | |
| Energy/fatigue | <5 year | 51 | 93.36 | 0.002 | 0.01 | 0.001 | 276 |
| | 5-9 year | 52 | 72.11 | | | | |
| | ≥ 10year | 49 | 63.61 | | | | |
| Assessment of one's own mental health | <5 year | 51 | 90.96 | 0.016 | 0.009 | 0.018 | 0.849 |
| | 5-9 year | 52 | 69.44 | | | | |
| | ≥ 10 year | 49 | 68.94 | | | | |
| Social functioning | <5 year | 51 | 83.65 | 0.138 | 0.521 | 0.062 | 0.146 |
| | 5-9 year | 52 | 78.71 | | | | |
| | ≥ 10 year | 49 | 66.71 | | | | |
| Bodily Pain | <5 year | 51 | 82.84 | 0.11 | 0.958 | 0.021 | 0.004 |
| | 5-9 year | 52 | 84.84 | | | | |
| | ≥ 10year | 49 | 61.05 | | | | |
| General health perception | <5 year | 51 | 90.88 | 0.012 | 0.028 | 0.005 | 0.378 |
| | 5-9 year | 52 | 72.6 | | | | |
| | ≥ 10 year | 49 | 65.67 | | | | |

Regarding Pairwise comparisons, there is a statistical significant association between patients had the disease <5 year and those for 5-9 year for (energy/fatigue, emotional well-being, general health).

While there is a statistical significant association between patients had the disease for <5 year and those for ≥10 year for (energy/fatigue, emotional well-being, pain, general health).

There is a statistical significant association between patients took their treatment for 5-9 year and those for ≥10 year for (physical functioning, role functioning/physical, role functioning/emotional, social functioning, pain).

Table 13 shows a statistical significant association between source of treatment and mean QoL domains rank (physical functioning, role functioning/physical, role functioning/emotional, pain).

**Table 13 The mean QoL domain rank by treatment source of studied sample**

| Ranks | | | | K-W test | Pairwise comparisons sig. | | |
|---|---|---|---|---|---|---|---|
| **Scale** | **Treatment source** | **N** | **Mean Rank** | **Sig** | **1&2** | **1&3** | **2&3** |
| Physical functioning | Hospital | 30 | 83.18 | 0.004 | 0.25 | 0.063 | 0.002 |
| | Private | 37 | 94.16 | | | | |
| | Both | 85 | 66.45 | | | | |
| Role limitation due to physical problems | Hospital | 30 | 75.73 | 0.001 | 0.021 | 0.326 | <0.001 |
| | Private | 37 | 97.12 | | | | |
| | Both | 85 | 67.79 | | | | |
| Role limitation/emotional | Hospital | 30 | 73.33 | 0.007 | 0.035 | 0.715 | 0.002 |
| | Private | 37 | 94.34 | | | | |
| | Both | 85 | 69.85 | | | | |
| Energy/fatigue | Hospital | 30 | 61.37 | 0.107 | 0.094 | 0.04 | 0.782 |
| | Private | 37 | 81.42 | | | | |
| | Both | 85 | 79.7 | | | | |
| Assessment of one's own mental health | Hospital | 30 | 61.42 | 0.088 | 0.216 | 0.024 | 0.536 |
| | Private | 37 | 76.15 | | | | |
| | Both | 85 | 81.98 | | | | |
| Social functioning | Hospital | 30 | 84.25 | 0.05 | 0.535 | 0.071 | 0.039 |
| | Private | 37 | 87.72 | | | | |
| | Both | 85 | 68.88 | | | | |
| Bodily Pain | Hospital | 30 | 83.7 | 0.007 | 0.287 | 0.054 | 0.004 |
| | Private | 37 | 92.66 | | | | |
| | Both | 85 | 66.92 | | | | |
| General health perception | Hospital | 30 | 76.58 | 0.131 | 0.196 | 0.504 | 0.053 |
| | Private | 37 | 88.62 | | | | |
| | Both | 85 | 71.19 | | | | |

Regarding pairwise comparisons, there is a statistical significant association between patients got their treatment from hospital only and those from private source for (role functioning/physical, role functioning/emotional).

While there is a statistical significant association between patients got their treatment from hospital only and those from both hospital and private for (energy/fatigue, emotional well-being) where P=0.040, P=0.024 respectively.

There is a statistical significant association between patients got their treatment from private source only and those from both hospital and private for (physical functioning, role functioning/physical, role functioning/emotional, social functioning, pain).

## DISCUSSION

Assessment of quality of life depends not only on treatment methods but also on influence of series of factor's, i.e., socio-demographic difference, system of values, expectations, needs, attitudes and methods of valuing a disease situation and adaptation process of a patient to a new, changing situation [27,28]. Therefore, holistic approach to chronically ill patients is important while taking into account all spheres involved in health maintenance; according to WHO health is bio-psycho-social well-being, not only lack of disease or ailments" [29].

Birrell, et al. studied 86 RA patients attending specialist clinics and found that impairment of health status was moderate to mark by the SF-36, with significant differences from population norms and chronic disease states such as low back pain [30].

In a study on 26 Egyptian early RA patients from Sohag, the QoL was impaired also using the SF-36 measure [31]. Another study in Egypt, there was an impairment of all the 8 domains of the SF-36 was found in the RA patients, where the score of each domain was less than 50% of its maximum score.

In the current study, the calculated domains score the QoL in general was fair regarding all domains, but the role functioning/physical domain had the highest median score for QoL while Pain and general health domain score were the lowest regarding other domains, and in general, physical component summery was more affected than mental component.

There is a great deal of information suggesting that arthritis has a devastating effect on HRQoL [32]. One large survey makes this point clear where data from 32,322 adults in 11 US states indicated that adults with arthritis report significantly greater HRQoL impairment compared to those without [33].

These findings were consistent with some studies; where disease activity has been shown to be correlated with both physical and psychological domains of HRQoL [34,35]. Nevertheless, other studies have demonstrated that disease related variables are strong determinants of physical disability, but not necessarily the mental health [36]. It is worth mentioning that in all of these studies, disease activity has a stronger correlation with physical health than with mental health.

In this study, there is a statistical significant association between mean QoL domain and educational level, this result agrees with a study done by Leiden University Medical Center 2001 British Society [37-39].

According to the present study, there is no statistical significant association between mean QoL domain and gender. While in a cross-sectional study performed in Hospital Sierrallana, a teaching University Hospital in Northern Spain where they found that Female RA patients have lower QoL levels than their male counterparts [40].

According to the present study, there is a statistical significant association between mean QoL domain regarding physical functioning, role limitation regarding physical problem, energy/fatigue and age group, but there is no association with the Mental Component Summery.

From 31 studies were eligible for inclusion in the meta-analysis a higher mean age was associated with reduced physical functioning, and overall PCS, which is unsurprising given that physical function declines with age [41]. More noteworthy was the positive association between mean age and the mental health domain: a higher mean age was associated with improved levels of mental health. This finding, although contradicting a previous literature review that concluded that increased age reduced HRQoL in RA patients aged over 75 years [42].

According to the present study, there is statistical significant association between mean QoL mean domain and marital status, this result agrees with a study done in Iran [43].

Regarding this study, there is statistical significant association between mean QoL domain and residence, this result agrees with a study done in America [44].

According to the present study, there is statistical significant association between mean QoL domain and monthly income, this result agrees with a study done American [45,46].

Regarding disease duration, there is statistical significant association between mean QoL domain and disease duration, this result agrees with a study done in Egypt in which the disease duration was the most influencing factor on both the physical and mental function [47].

In this study there is a statistical significant association between physical functioning, role limitations due to physical problems (RP), bodily pain regarding PCS. And between role limitation/emotional and social functioning domains in MCS and type of treatment, while in a study in Egypt they found that, patients treated with biological drugs show bigger satisfaction from treatment and fewer unfavourable symptoms resulting from the used therapy [47].

In this study, there is a statistical significant association between source of treatment whether from hospital, private, or from both and mean QoL domains rank (physical functioning, role functioning/physical, role functioning/emotional, pain).

The high cost of biological treatment compared with non-biological is a factor in the increasing health costs associated

with the treatment of RA. Interest in incorporating QoL parameters in formulary and public health decision making concerning the use of new agents for RA is increasing [48].

## CONCLUSION

This study confirms that RA has a significant effect on the health-related quality of life of patients. The quality of life in RA patients was high regarding role limitations due to physical problems (RP), Role limitation/emotional but it was poor in bodily pain and general health perception. Quality of life affected by (educational level, blood pressure, age group, marital status, residence, monthly income, duration of disease, type of treatment) but not affected by gender.

**Recommendations**

- Increase the number of specialized centers for rheumatology, and improve the quality of services for RA in order to decrease the responsibilities and financial burden on the patient.
- Routine assessment of the HRQoL in those patients is recommended to detect and monitor the impact of the disease and its medications on different aspects this can be achieved through adequate health education about the nature of the disease and how to cope with it.
- More research is needed to identify the prevalence of disease in Iraq.
- Studies are needed to examine how these quality of life measures, change over time and respond to different management interventions.

## DECLARATIONS

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**Conflict of interest**

The author has disclosed no potential conflicts of interest, financial or otherwise.

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