

## Health Related Quality of Life among the Patients with Rheumatoid Arthritis

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### Abstract

**Background:** Rheumatoid Arthritis (RA) is considered a public health problem with increasing global prevalence that reached 14.9 in 2017. In addition to impairment of daily life activities, individuals diagnosed with RA suffer from psychological disorders. **Aim:** The study aim was to assess the health related quality of life among the patients with rheumatoid arthritis. **Methods:** A descriptive exploratory design was utilized to conduct the current study. Data was collected from Rheumatology Clinics in King Abdulaziz Medical City in Riyadh, Saudi Arabia over three months using a convenience sample of 300 adult patients attending Rheumatology Clinics diagnosed with RA. A self-report survey was used, and it encompassed a demographic data and World Health Organization Quality of Life (WHOQOL-BRIEF) tool. **Results:** A total of 300 participants suffering from RA were participated in the study. Quality of life domains four domains along with overall quality of life mean scores were significantly low among the studied participants. Physical health was the lowest (19.89 out of 35  $\pm$  7.04,  $p = 0.00$ ) among the four domains, followed by psychological (21.22 out of 30  $\pm$  5.73,  $p = 0.00$ ), then environment (28.19  $\pm$  8.72,  $p = 0.00$ ) and lastly social relations (12.06 out of 15  $\pm$  7.29,  $p = 0.00$ ) which was rated as the highest among those domains. Overall quality of life mean score was perceived on low scores by participants (81.36 out of 120  $\pm$  28.80,  $p = 0.00$ ). **Conclusion:** Total mean scores of all quality of life domains were significantly rated as low by the studied participants with RA. Physical health was rated as the lowest among the four domains, followed by psychological, then environment and lastly social relations which was rated as the highest among those domains. Extreme of age, being divorced and low income were significantly associated with low rating of quality of life.

**Key words:** Quality of Life, Rheumatoid Arthritis, Patients.

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## Introduction

Rheumatoid Arthritis (RA) is considered a public health problem with increasing global prevalence that reached 14.9 in 2017 (Safiri, et al., 2019). The RA prevalence differs based on geographical locations with noticeable increase in urban regions indicating that genetic and environmental factors affect disease development (Almutairi, Nossent, Preen, Keen, & Inderjeeth, 2020). Regarding Saudi Arabia, till the moment there is an apparent lack of population-based studies targeting national prevalence of RA (Almoallim & Alharbi, 2014; Almoallim, et al., 2020).

The RA is one of inflammatory autoimmune chronic systemic diseases that affects the joints, connective tissues, muscle, tendons, and fibrous tissue resulting in pain and deformity and causing disabling condition. It affects age group between 20 and 40 years with significant musculoskeletal functional impairment and disability with high direct and indirect cost of healthcare (Chronic diseases and health promotion, 2021), (Uhlrig, Moe, & Kvien, 2014). The RA is a risk factor for infection, pulmonary and cardiovascular diseases, osteoporosis, cancer, and death (Sparks, 2019). In addition to impairment of daily life activities, individuals diagnosed with RA suffer from psychological disorders including depression and anxiety (Rosa-Gonçalves, Bernardes, & Costa, 2018). Depression is doubled among patients with RA when compared to general population with a bidirectional relationship with RA (Lwin, Serhal, Holroyd, & Edwards, 2020). Chronic inflammation is associated with impairment in stress response including coping strategies, leading to anxiety and depression, which in turn deteriorate long term RA outcome (Vallerand, Patten, & Barnabe, 2019), (Ziarko, et al., 2019).

Impaired social relationships, sexual dysfunctions and reduced work productivity are associated with RA (Goma, Razek, & Abdelbary, 2019). Pain was significantly correlated with poorer social and physical functioning among patients with RA (Martinec, Pinjatela, & Balen, 2019). It was found that different levels of disease severity significantly

affect quality of life in which lower quality of life was associated with higher severity of disease (Rosa-Gonçalves, et al, 2018). The RA severity of symptoms and associated psychological problems have a negative effect on patients' quality of life (Katchamart, Narongroeknawin, Chanapai, & Thaweerathaku, 2019).

Investigating quality of life is identified as assessing the impact of a disease or health problem on well-being and functional health status as reported by the patients. Quality of life encompasses psychological, social, physical, along with subjective feelings of well-being that reflect patients' own evaluation of their disease and well-being as well as their reaction to the disease (Fontaine, 2021). Quality of life is also described as an individual's insight of their situation in life encompassing psychological, social, physical and environmental domains in the context of their cultural and value background (WHOQOL, 2021).

Consequently, quality of life is a significant indicator of effects of RA on a patients' lives, besides the outcome of treatment. There is a growing focus on patients' perception of health, disease condition and its impact on their life (Cruz-Castillo, Montero, Salazar-Ponce, & Villacís-Tamayo, 2019). Lack of physical activity, unemployment, smoking, higher disease activity, disability and depression were also significantly associated with poorer quality of life among patients with RA (Isnardi, et al., 2020). As well, social context impacts coping strategies and psychological reactions to RA, and can also impairs treatment adherence and hence outcomes (Sturgeon, Finan, & Zautra, 2016). Searching PubMed data base in January 2019 did not reveal any study conducted in Saudi Arabia that target quality of life among patients with RA.

## Aim of the study:

The study aim was to assess the health related quality of life among the patients with rheumatoid arthritis

**Research question:** What is the health related quality of life among the patients with rheumatoid arthritis?

## Material and Methods

### Study Design

A descriptive exploratory design was utilized to conduct the current study.

### Setting

Data was collected from Rheumatology Clinics in King Abdulaziz Medical City (KAMC) affiliated to Ministry of National Guard Health Affairs (MNGHA) in Riyadh, Saudi Arabia. Rheumatology Clinics provide care to over 250 inpatients with rheumatic diseases and approximately 500 outpatients per month.

### Participants

A 300 adult patients attending Rheumatology Clinics diagnosed with RA and voluntarily giving their informed consent were recruited in the study from both sexes. All the participants signed written informed consent after explaining purpose of the study. Participants were ensured that their participation is anonymous and voluntarily and they have the right to withdraw their participation at any time. The Inclusion criteria was as following; 18 years old and above, diagnosed with RA, Arabic speaker, all nationalities, both genders. Exclusion criteria was RA end stage, patients with mental illness or cognitive dysfunction, patients with any other chronic disease rather than RA.

### Sample Size

GPower software was used to calculate sample size with; 5 % margin of error, 95 % confidence interval, power of 0.95, and 0.2 effect size. Calculated sample size was 262 participants which was increased to 300 to overcome attrition rate and missing data.

### Sampling Technique

A convenient sampling technique was utilized, which is a form of sampling where the initial available primary data source was used for research without extra requirements.

### Tools of data collection

A self-report survey was used, and it encompassed a demographic data and World Health Organization Quality of Life

(WHOQOL-BRIEF) tool. Demographic data included questions about age, sex, educational level, marital status, type of community, employment, and income.

The WHOQOL-BREF was a 26-items self-report, self-administered tool, rated on a 5-points Likert-type scale ranging from 1; strongly agree to 5; strongly disagree), with higher scores representing better quality of life and vice versa. There were 4 subscales within the instrument which measured the 4 domains comprising 24 items: physical health with 7 items, psychological health with 6 items, social relationships with 3 items, and environment with 8 items, in addition to two items about overall quality of life and general health. WHOQOL-BREF exhibited good discriminant validity, content validity, internal consistency, and test-retest reliability (The WHOQOL Group, 1998) . The sum of the responses to each of the subscales provided a score for the overall HRQOL. Raw scores on 4 domains were calculated by adding the values of single items and transformed on a scale ranging from 0–100, where 100 was the highest and 0 was the lowest HRQOL. The following values of scores were extracted from the reviewed studies and were applied in the current study: score  $\leq 45$  grade, indicated poor or bad HRQOL; score  $< 45-65$  grade revealed moderate HRQOL; and score  $> 65$  grade indicated relatively high HRQOL.

Regarding reliability of WHOQOL-BREF Arabic version, the internal consistency measured using Cronbach's alpha was 0.93 and Intra-class correlation coefficient (ICC) for the test-retest statistic was 0.95. Construct validity in terms of factor analysis of all items yielded four factors accounting for 58.7% of the variance and each item load was  $\geq 0.45$  on the corresponding factor representing the same constructs (Ohaeri & Awadalla, 2009). A pilot sample of 30 patients with RA was obtained to ensure the reliability and clarity of the questionnaire and it was excluded from the study. The result helped to rephrase the questionnaire.

### Data Collection

Data was collected from Rheumatology Clinics in King Abdulaziz Medical City in Riyadh, Saudi Arabia over three months (15

March 2019 to 15 May 2019) using a convenience sample of 300 adult patients attending Rheumatology Clinics diagnosed with RA. Surveys were distributed by research assistants who were trained on using the surveys items on patients diagnosed with RA who gave their informed consent after explaining the goal of the study and all related information to ensure that the patients signed consent forms voluntarily. **Ethics approval:** The study was approved (SP19/037/R) by the Research Unit - College of Nursing, King Saud bin Abdulaziz University for Health Sciences, and Institutional Review Board (IRB) in King Abdullah International Medical Research Center (KAIMRC), National Guard Health Affairs (NGHA), Riyadh, Saudi Arabia. Approval from the Rheumatology Clinics to was obtained as well. The patient's information had been assured that "all data both hard and soft copies must be stored within NGHA premises and access by the research team only".

### Data Management and Analysis

Data was entered, cleaned, and analyzed using Statistical Package for Social Science (SPSS) software version 22.0. Descriptive analyses were conducted using frequency, mean and standard deviation (SD) for demographic variables and each QOL domain and overall QOL. One sample T-test was used to assess participants' mean scores and standard deviations were significantly different from total of each domain along with overall domain. T-test and ANOVA were used to analyze associations between demographic variables and QOL domains.

### Results

A total of 300 participants suffering from RA gave their consent and participated in the study. Nearly half of participants (47%) were 50 years old or more. Most of the participants (87.0%) were females, unemployed (76.0%), married (73.0%), living in urban community (92.0%), nearly half of participants (48%) had a university degree and 77% of them earned less than 5,000 SAR per month (1,200 US Dollar per month) (See Table 1).

Concerning quality of life domains, the four domains along with overall quality of life were significantly low among participants.

Participants rated their physical health as the lowest among the four domains, followed by psychological, then environment and lastly social relations which was rated as the highest among those domains (See Table 2).

Physical health domain was the lowest rated domain among QOL four domains ( $19.89$  out of  $35 \pm 7.04$ ,  $p = 0.00$ ). Physical health items including mobility, activity of daily living, sleeping and rest and work capacity were  $3.47 \pm 1.01$ ,  $3.15 \pm 1.17$ ,  $3.33 \pm 1.17$  and  $2.98 \pm 1.20$  respectively. The lowest mean score was for dependence on medicinal substance and medical aids to function on daily life ( $2.03 \pm 0.77$ ) followed by pain and discomfort ( $2.16 \pm 0.83$ ).

Similarly, psychological health ( $21.22$  out of  $30 \pm 5.73$ ,  $p = 0.00$ ) followed physical domain with relatively low score. Mean score  $\pm$  SD for self-esteem ( $4.15 \pm 0.84$ ) was higher than other items followed by the spirituality and religion ( $3.97 \pm 1.04$ ), while the lowest mean score  $\pm$  SD was for negative feelings ( $2.21 \pm 0.80$ ).

Social relationship domain had the highest scores among the four domains ( $12.06$  out of  $15 \pm 7.29$ ,  $p = 0.00$ ). Within social relationship domain, the highest mean score  $\pm$  SD was for personal relationships ( $4.12 \pm 0.96$ ) followed by sexual activity ( $4.08 \pm 5.27$ ).

In relation to environment ( $28.19 \pm 8.72$ ,  $p = 0.00$ ), its scores were low similar to psychological domain. Among this domain the highest mean score was for accessibility and quality of health and social care ( $4.08 \pm 1.04$ ) and freedom physical safety and security ( $4.06 \pm 0.99$ ). On the other hand, the mean score of participation in and opportunity in recreation/leisure activities was significantly low ( $2.61 \pm 1.03$ ). Overall quality of life was perceived on low scores by participants ( $81.36$  out of  $120 \pm 28.80$ ,  $p = 0.00$ ).

Regarding univariate analysis of demographic characteristics and quality of life mean scores for all domains including physical, psychological, social relationship, environment and overall QOL mean score were significantly associated with one or more demographic variable.

As total physical health domain mean score, it was highly significantly associated with age, marital status, educational level, type of community and income. Physical health had the highest rating by adults from 30 to 39 years old ( $21.5 \pm 5.46$ ,  $p = 0.00$ ) then it declined with increasing age as it had the lowest scores by participants who were 50 years old or more ( $18.82 \pm 4.17$ ,  $p = 0.00$ ). Single marital status, university degree education, urban community and middle income from 5,000 to 10,000 SAR were associated with high scores on physical health ( $22.66 \pm 4.75$ ,  $21.25 \pm 4.67$ ,  $19.90 \pm 4.43$ , and  $22.40 \pm 3.61$  respectively,  $p = 0.00$ ). On the other hand, physical health lowest ratings were found among divorced, high school education, rural community, and low income < 5000 SAR variables ( $18.40 \pm 2.41$ ,  $18.00 \pm 2.19$ ,  $19.00 \pm 2.75$ , and  $19.32 \pm 4.13$  respectively,  $p = 0.00$ ).

Total psychological domain mean score was highly significantly associated with age, gender, employment and income. The youngest age group from 18 to 29 years old significantly had the lowest score on psychological health domain ( $17.60 \pm 2.45$ ,  $p = 0.00$ ) then it peaked among adults who were 30 to 39 years old ( $21.11 \pm 3.69$ ,  $p = 0.00$ ). Female, unemployed and low income participants with less than 5,000 SAR had the lowest rating on psychological domain ( $20.02 \pm 3.56$ ,  $19.92 \pm 3.50$  and  $19.59 \pm 3.44$  respectively,  $p = 0.00$ ).

Total social relationship mean score was highly significantly affected by age as it was higher among adult participants from 30 to 39 years old ( $14.38 \pm 12.57$ ,  $p = 0.00$ ), while the lowest rating was among age group from 40 to 49 years old ( $11.20 \pm 2.43$ ,  $p = 0.00$ ).

Total environment mean score varied significantly by age, marital status, educational level, and income. Environment was highly valued by participants aged 50 years old or more ( $29.04 \pm 5.20$ ,  $p = 0.00$ ), singles ( $29.66 \pm 5.28$ ,  $p = 0.00$ ), with educational level below high school ( $29.11 \pm 5.38$ ,  $p = 0.00$ ) and participants with middle income from 5,000 to 10,000 SAR ( $30.70 \pm 4.74$ ,  $p = 0.00$ ).

Overall QOL mean score was highly significantly associated with age, marital status and income. Lowest rating of overall QOL was youngest age group from 18 to 29 years old,

divorced and participants with low income below 5,000 SAR ( $75.60 \pm 11.86$ ,  $69.40 \pm 7.39$  and  $78.63 \pm 13.85$  respectively,  $p = 0.00$ ).

**Table (1): Frequency & percentage distribution of demographic Characteristics of the Participants under study (N=300)**

Characteristics	N (300)	%
Age		
18-29 yrs.	30	10.0
30-39 yrs.	54	18.0
40-49 yrs.	75	25.0
≥50 yrs.	141	47.0
Gender		
Males	39	13.0
Females	261	87.0
Marital Status		
Single	27	9.0
Married	219	73.0
Divorced	15	5.0
Widowed	39	13.0
Level of Education		
Below high school	135	45.0
High school	21	7.0
University	144	48.0
Type of community		
Urban	276	92.0
Rural	24	8.0
Employment Status <sup>a</sup>		
Employed	69	23.0
Unemployed/retired	228	76.0
Income (SR)		
<5,000 SR	231	77.0
5,000-10,000 SR	30	10.0
>10,000 SR	39	13.0

Note. \**p* value < 0.05.

<sup>a</sup> Employment status = 297 and missing data = 3.

**Table (2): Participants' health related Quality of life (HRQOL) Total Mean Score in each WHOQOL- BRIEF domain (N=300)**

Domains	M	±	SD	P value
<b>Physical Health</b>				
Activity of daily living	3.15	±	1.17	
Dependence on medicinal substance and medical aids to function on daily life	2.03	±	0.77	
Energy and fatigue	2.76	±	0.87	
Mobility	3.47	±	1.01	
Pain and discomfort	2.16	±	0.83	
Sleep and rest	3.33	±	1.17	
Work capacity	2.99	±	1.20	
Total of domain 1 (out of 35)	19.89	±	7.04	0.00*
<b>Psychological health</b>				
Bodily image and appearance	3.75	±	1.06	
Negative feelings	2.21	±	0.80	
Positive feelings	3.58	±	0.94	
Self-esteem	4.15	±	0.84	
Spirituality/religion/ personal beliefs	3.97	±	1.04	
Thinking, learning, memory, concentration	3.56	±	1.03	
Total of domain 2 (out of 30)	21.22	±	5.73	0.00*
<b>Social relationship</b>				
Personal relationships	4.12	±	0.96	
Social support	3.86	±	1.06	
Sexual activity	4.08	±	5.27	
Total of domain 3 (out of 15)	12.06	±	7.29	0.00*
<b>Environment</b>				
Financial resources	2.98	±	1.13	
Freedom physical safety and security	4.06	±	0.99	
Health and social care: accessibility and quality	4.08	±	1.04	
Home environment	3.62	±	1.06	
Opportunity for acquiring new information and skills	3.30	±	1.07	
Participation in and opportunity in recreation/ leisure activities	2.61	±	1.04	
Physical environment (pollution/ noise/traffic/ climate)	3.90	±	1.10	
Transport	3.64	±	1.26	
Total of domain 4 (out of 40)	28.19	±	8.72	0.00*
Overall HRQOL (out of 120)	81.36	±	28.80	0.00*

Note. \**p* value < 0.05. One sample T – test was used to compare participants' scores against total domain along with overall total score.

**Table (3): Univariate association between the socio-demographic characteristics and quality of life (QOL) domains**

Baseline characteristic	Physical Health		Psychological Health		Social Relationship		Environment		Overall QOL	
	M±	SD	M±	SD	M±	SD	M±	SD	M±	SD
<b>Age</b>										
18-29	20.80	3.04	17.60	4.27	11.70	2.45	25.50	5.74	75.60	11.86
30-39	21.50	5.46	21.11	3.69	14.38	12.57	28.94	5.81	85.94	20.26
40-49	20.08	3.62	19.52	2.59	11.20	2.43	27.12	5.69	77.92	10.96
≥50	18.82	4.17	20.52	3.71	11.70	2.50	29.04	5.20	80.06	12.20
<i>P</i> value	0.00*		0.00*		0.01*		0.00*		0.00*	
<b>Gender</b>										
Male	20.69	4.09	20.46	4.17	11.07	2.58	28.07	4.84	80.30	12.68
Female	19.69	4.35	20.02	3.56	12.20	6.18	28.20	5.71	80.11	14.20
<i>P</i> value	0.24		0.01*		0.77		0.15		0.77	
<b>Marital status</b>										
Single	22.66	4.75	21.44	3.19	11.66	1.73	29.66	5.28	85.44	10.48
Married	19.69	4.24	20.01	3.75	12.49	6.62	28.39	5.70	80.58	14.98
Divorced	18.40	2.41	19.00	2.85	10.60	3.31	21.40	4.61	69.40	7.39
Widowed	19.15	4.35	19.92	3.47	10.46	2.59	28.61	3.61	78.15	9.39
<i>P</i> value	0.00*		0.15		0.16		0.00*		0.00*	
<b>Educational level</b>										
Below high school	18.56	3.64	20.47	3.48	12.77	8.30	29.11	5.38	80.93	14.62
High school	18.00	2.19	20.57	1.53	11.71	2.10	27.57	4.23	77.85	6.91
University degree	21.25	4.67	19.64	3.95	11.43	2.34	27.41	5.86	79.75	14.17
<i>P</i> value	0.00*		0.13		0.15		0.03*		0.58	
<b>Type of community</b>										
Urban	19.90	4.43	20.05	3.69	12.07	6.06	28.16	5.59	80.17	14.19
Rural	19.00	2.75	20.37	3.14	11.87	2.25	28.50	5.75	79.75	11.73
<i>P</i> value	0.01*		0.49		0.47		0.68		0.16	
<b>Employment</b>										
Employed	21.21	4.41	20.69	4.07	11.30	2.36	29.08	4.86	82.30	13.54
Unemployed	19.30	4.15	19.92	3.50	12.28	6.57	27.89	5.81	79.38	14.15
<i>P</i> value	0.62		0.01*		0.26		0.06		0.55	
<b>Income</b>										
<5,000	19.32	4.13	19.59	3.44	12.22	6.53	27.51	5.64	78.63	13.85
5,000-10,000	22.40	3.61	23.00	2.84	11.60	1.83	30.70	4.74	87.70	10.15
>10,000	20.76	5.07	20.69	4.21	11.46	2.74	30.23	4.94	83.15	15.20
<i>P</i> value	0.00*		0.00*		0.68		0.00*		0.00*	

Note. \* *P* value < 0.05.

## Discussion

The RA affects all aspects of life including physical, psychological, social and environmental health dramatically (Goma, et al. 2019). Age of 50 years and more, divorced marital status, high school education, rural residence and low income were linked to low physical health. Total low mean scores of psychological health was significantly associated with young age, females gender, unemployment and low income. Environment was affected by young age, divorced marital status, university degree education and low income. Significantly overall QOL low rating was specifically associated with young age, being divorced and low income.

All domains of quality of life were significantly rated as low by the studied participants with RA. Physical health was the lowest due to the physical impact and limitations caused by RA, followed by psychological health, environment health and lastly by social relations. In a similar study, physical health received the lowest rating followed by psychological health among individuals suffering from RA. Physical health consequences of RA especially inflammatory process, chronic pain, joints deformation and fatigue resulting in limited physical functioning contribute to lowered perception of physical health (Chronic diseases and health promotion, 2021). Hence, it is expected that with increasing age, participants tend to provide low rating of their physical health. Also, participants living in rural areas scored significantly lower on physical health may be due to limited access to health services. Regarding marital status, divorced participant significantly rated lower on physical, environment and overall quality of life. While in another study, marital status did not vary significantly (Awada, et al., 2019). It could be explained that divorced participants may lack social and economic support. Additionally, participants with higher level of education had higher rating of their physical health, which could be associated with better job opportunity and income compared to participants with lower educational levels. In the same line, a study found that higher level of education was

linked to higher scores on physical health and overall QOL (Faiq, Kadhim, & Gorial, 2019).

Impaired physical health associated with RA impacts stress response and lead to psychological problems which affects patients' psychological health as well. Chronic diseases including RA are associated with depression, anxiety and other mental health problems as well as impairment of other aspects of life including social and occupational functioning (Vallerand, et al. 2019), (Wysocka-Skurska, Sierakowska, & Kułak, 2016).

Interestingly and contrary to other studies, the current study results showed lower mean scores of psychological health with youngest age group from 18 to 29 years old (Berner, Erlacher, Fenzl & Dorner, 2018), (Wysocka-Skurska, et al. 2016). Increasing age associated with higher scores of psychological health could be explained by positive view of aging as they derive strength from their Islamic religion values and beliefs (Karlin, Weil, & Felmban, 2016). Additionally, seniors and aging individuals receive remarkable respect and appreciation reflecting strong family bonds in Saudi community again arising from Islamic values (Al-Khraif, Abdul Salam, & Rashid, 2020). Females had lower mean scores of psychological health when compared to male subjects. Literature confirmed that women are more likely to suffer from mental health problems compared to men (Kiely, Brady, & Byles, 2019) with lower perception of quality of life (Carmel, 2019).

Unemployed participants had significantly lower scores of psychological domain. In harmony with present results, employment was associated with higher scores in overall quality of life (Faiq, et al. 2019). It is not surprising that the majority of participants were not employed. Work ability of individuals is severely affected by RA resulting in higher rates of unemployment (Berner, et al., 2018). Unemployment was significantly associated with lower rates on psychological health (Gamal, Mahran, Abo El Fetoh, & Janbi, 2016). Low income which in turn lowers quality of life significantly as shown in the current study results including physical, psychological, environment and overall quality of life.

One of the study strengths was confirmed diagnosis of RA in addition to use of valid and reliable tool to assess quality of life.

## Conclusion

Total mean all quality of life domains was significantly rated as low by the studied participants with RA. Physical health was rated as the lowest among the four domains, followed by psychological, then environment and lastly social relations which was rated as the highest among those domains. Extreme of age, being divorced and low income were significantly associated with low rating of quality of life.

## Implications to Practice

- Rheumatoid Arthritis patients with age extremes need structured comprehensive physical and psychological nursing assessment to tackle their needs and comorbid health problems.
- Social support system needs further screening especially among divorced and low-income RA patients to ensure highest quality of life.

## Limitations

This study was conducted specifically within the city of Riyadh which limits its generalizability to other cities in Saudi Arabia. Also, the convenient sampling technique introduced a selection bias to study since those who agreed to participate may not be similar to those who did not and may have had different experiences. Lack of disease activity and disability measurement as well as severity of disease and its complications.

## Recommendations

It is recommended to have different health awareness programs, educational interventions and mass media campaigns regarding the strategies to enhance the better quality of life for patients with RA as well as advertisement through the social media (Facebook, Instagram, YouTube), health messages through the cell phones for this target group. Research studies to assess the common psychological disorders such as depression and anxiety and any other co-morbidities among patients with RA are

recommended. Further studies are required to explore the social support system and health care services access for patients with RA in order to enhance their quality of life. Replication of this study is also recommended taking into consideration the stated limitation.

## Authors' contributions

All authors were responsible for study conception and design, data collection, analysis, and interpretation. All authors critically read and approved the final manuscript for important intellectual content.

## Conflict of interest

The authors declare that they have no competing interests.

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