

# The impacts of state and trait anxiety as moderated by perceived social support among Nigerian patients with rheumatoid arthritis

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## Abstract

**Objectives:** To assess the levels of state and trait anxiety and determine their relationships with perceived social support among Nigerian patients with rheumatoid arthritis (RA).

**Material and methods:** A cross-sectional study of 50 patients satisfying the 2010 American College of Rheumatology/European League against Rheumatism Classification Criteria for RA was conducted. Anxiety was assessed using the Spielberger State-Trait Anxiety Inventory (STAI), perceived social support by the Interpersonal Support Evaluation List (ISEL), health-related quality of life (HRQoL) by the Medical Outcome Study 36-Item Short Form Health Survey (SF-36) and disability by the Health Assessment Questionnaire-Disability Index (HAQ-DI).

**Results:** The mean state anxiety (STAI-S), trait anxiety (STAI-T) and ISEL scores among the patients were  $35.2 \pm 10.2$ ,  $36.7 \pm 8.8$  and  $87.2 \pm 21.2$  respectively. Pathological degrees of state and trait anxiety were found among 7 (14%) and 5 (10.4%) patients respectively. There was a negative correlation between the STAI-T score and the ISEL score ( $r = -0.362$ ,  $p = 0.011$ ). However, the correlation between STAI-S and ISEL was not statistically significant ( $r = -0.193$ ,  $p = 0.179$ ). A moderate-to-high correlation was found between each of STAI-S and STAI-T and all subscales and component summaries of the SF-36. ISEL score correlated significantly with role emotional ( $r = 0.377$ ,  $p = 0.008$ ), mental health ( $r = 0.482$ ,  $p \leq 0.001$ ) and bodily pain ( $r = 0.320$ ,  $p = 0.025$ ) domains and the mental component summary ( $r = 0.380$ ,  $p = 0.007$ ) of SF-36. HAQ-DI correlated strongly with both STAI-S ( $r = 0.735$ ,  $p \leq 0.001$ ) and STAI-T ( $r = 0.575$ ,  $p \leq 0.001$ ) but not with ISEL.

**Conclusions:** State and trait anxiety correlate negatively with all aspects of HRQoL and disability, and there is a notable relationship between perceived social support and trait anxiety as well as the mental aspect of HRQoL.

**Key words:** rheumatoid arthritis, anxiety, perceived social support.

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## Introduction

Rheumatoid arthritis (RA) is the most common autoimmune inflammatory arthritis worldwide with an estimated prevalence of 0.5% to 1%, and it affects women three times as often as it affects men [1]. While the cause of RA is unknown, abundant evidence has demonstrated the variable contributions of genetic and environmental factors to the etiology of RA [2]. Similarly, the course and severity of RA are believed to be influenced by contributions from inherent and extraneous attributes of the patient. Rheumatoid arthritis is associated with significant disability and excess mortality. Sufferers have a 30% higher chance of needing help with self-care and they experience limitation in basic activities of daily life at double the rate compared to people without the disease [3].

The impact of RA exceeds the physical and economic burdens. Enormous challenges and losses result from the psychosocial unwellness associated with RA and a patient's disease might run a much worse course bearing severe consequences due to the failure to recognize the psychological and emotional morbidity involved [4]. The quality of life of patients with RA is influenced by various psychosocial factors which include income, level of education, social integration, social support and the presence of various psychological distresses [5].

Since a complex interplay is known among the factors determining damage accrual in RA and the disability has been traditionally attributed to joint damage, a predictive role of psychological and social factors, which are very different between cultures and races, is gaining recognition [6]. Interestingly, it has been suggested that the effect of some psychological aspects of RA may shift in favor of the patient as the disease progresses and the individual learns to adapt better [7]. Anxiety is a negative emotion which has been associated with perseverative cognition, a maladaptive process of perpetuating the distress due to stressors by sustaining the thought of the event [8]. It is now known that between 21% and 70% of patients with RA have co-morbid anxiety and it may influence the quality of life in ways independent of depression [9]. Anxiety has been described in terms of two subsets, the state anxiety and the trait anxiety. State anxiety is situational and depends on the experience of the individual at the moment while trait anxiety refers to the constitutional anxiety expressed by a person. The two tend to be largely independent, and while state anxiety is a momentary condition, trait anxiety refers to the personality and is fairly stable [10]. It is thought that the totality of anxiety exhibited by an individual is a reflection of both anxiety types and these may be influenced by the perceived social support.

Due to the understanding that the impact of psychological disturbance may be influenced by the genetic and cultural characteristics of a population, the effect of this factor on the quality of life among West African patients with RA may exhibit some peculiarities. Patients with RA in the sub-Saharan area rarely have a diagnosis at the stage of early arthritis and often already at the time of diagnosis have advanced deformities compared with patients with RA in Europe [11]. In contrast to patients in Europe, the treatment options available for these patients are often limited, and many of them do not have access to biological drugs, and hence it has a greater impact on their quality of life [12].

From the above conclusions about patients from Sub-Saharan Africa, it appears that social support may be of particular importance for the perception of the disease and the ability to cope with it. We hypothesized that if there is an association between social support and anxiety felt by the patient, then the impact of anxiety on the quality of life can be modulated by the social support they use. The aim of this study is to determine the degree of state and trait anxiety and their relationship to perceived social support among Nigerian patients with RA.

## Material and methods

### Patients and procedure

A cross-section of 50 patients satisfying the 2010 American College of Rheumatology (ACR)/European League against Rheumatism (EULAR) Classification Criteria for RA was studied. These were adult patients receiving care at the rheumatology clinic of the University of Ilorin Teaching Hospital (UIH). Patients were considered if they were older than 18 years and willing to provide informed consent for the study. Patients with overlap syndromes, diagnosed mental illness and patients with unrelated acute illnesses (for instance malaria) were excluded. Demographic and clinical details were taken using a structured interviewer-administered questionnaire. All patients were tested for rheumatoid factor by nephelometry and anti-citrullinated protein antibody (ACPA) by enzyme-linked immunosorbent assay. The socio-economic status was defined in terms of total monthly income from all sources and was classified as low (less than 100 thousand naira), middle (between 100 thousand and 400 thousand naira) and high (above 400 thousand naira). The disease activity was rated in terms of the Clinical Disease Activity Index (CDAI): CDAI = tender joint count (TJC) + swollen joint count (SJC) + patient global assessment (VAS 0–10) + physician global assessment (VAS 0–10).

Remission was defined by a CDAI score  $\leq 2.8$ ; low disease activity, 2.9 to 10; moderate disease activity, 10.1 to 22; and high disease activity, 22 to 76. Functional status was determined according to the Steinbrocker functional classification. Class I represents complete ability to carry out all the usual duties without handicaps; class II, adequate for normal activities despite handicap of discomfort or limited motion of one of the joints; class III, limited to few or none of the duties of usual occupation or self-care; class IV, incapacitated, largely or wholly bed-ridden or confined to a wheelchair with little or no self-care.

## Measures

### Anxiety inventory

The Spielberger State-Trait Anxiety Inventory (STAI) was used to assess the degree of anxiety experienced by patients. The tool determines the patient's feelings at the point of assessment in two broad subscales each calculated from a set of 20 statements to which there are no right or wrong answers. The two subscales are the state anxiety (STAI-S), which reflects the situational anxiety about an event, and the trait anxiety (STAI-T), which is the inherent characteristic in a person which is independent of conditions. The statements in the inventory are rated from 1 to 4 according to how much of each item the individual is currently feeling (STAI-S) or how often each item is felt (STAI-T). The total scores range from 20, which reflects the lowest possible degree of anxiety (state or trait), to 80, the highest possible anxiety score. Total STAI scores greater than 50 suggest pathological levels of anxiety [13]. The median alpha reliability coefficients for STAI-S and STAI-T have been reported to be 0.92 and 0.90, respectively [14].

### Perceived social support

The Interpersonal Support Evaluation List (ISEL) was employed to determine the level of perceived social support in each patient. ISEL is a tool designed as a 40-item list that combines positive and negative statements about social relationships to enhance desirability to responders. The questions are evenly distributed to assess 4 subscales of the ISEL. The Appraisal Support Subscale measures the perceived availability of someone to offer advice, the Tangible Support Subscale measures the availability of material aid, the Self Esteem Support Subscale measures the presence of a positive comparison when comparing oneself to others, and the Belonging Support Subscale assesses the perceived availability of others for doing things with. The ISEL reports the scores of each of the four subscales and may be used to generate a total score which is the sum of the 4 subscale scores. The highest possible score in each subscale is 30 and hence the

highest possible total score is 120. The higher the score, the better the perceived interpersonal support is.

### Disability

Disability was assessed using the Health Assessment Questionnaire-Disability Index (HAQ-DI). The HAQ-DI is a clinical health assessment tool developed at the Division of Immunology and Rheumatology, Stanford University. It has become a core assessment tool for disability in clinical trials in RA. The HAQ-DI has been shown to be reliable in different contexts in rheumatology research. Test-retest correlations have been documented to range between 0.87 and 0.99 while the correlations between interview and questionnaire formats range between 0.85 and 0.95. By face-to-face interviewer administration, the 8 domains (dressing and grooming, arising, eating, walking, hygiene, reach, grip and common daily activities) were assessed over the past week. These produced a global score ranging from 0 (no disability) to 3 (maximum disability) [15].

### Health-Related Quality of Life

The Health-Related Quality of Life (HRQoL) was assessed using the Medical Outcome Study 36-Item Short Form Health Survey (SF-36). As an indicator of overall health, SF-36 consists of 36 items that are combined into 8 domains of HRQoL which are physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). These 8 domains can be summarized into two summary scores: the physical component summary (PCS) and the mental component summary (MCS). SF-36 scores range from 0 to 100 with the higher scores denoting better HRQoL. The SF-36 is widely validated and has a reliability in excess of 0.80 [16].

### Ethical consideration

Ethical approval was obtained from the research and ethics committee of the University of Ilorin Teaching Hospital (UITH).

### Statement of human and animal rights

The study protocol was designed in compliance with the 1964 Declaration of Helsinki and its later amendments. Informed consent was obtained from all individual participants prior to their inclusion in the study.

### Statistical analysis

All statistical analyses were performed using SPSS version 20 (IBM, Armonk, NY). We hypothesized that anxiety measured by STAI would show a relationship

with the perceived social support determined by ISEL and that there would be an association between anxiety and the attainment of remission or low disease activity. Continuous variables were summarized as means and standard deviations while categorical variables were presented as frequencies and percentages. Association between each of STAI and ISEL as well as each clinic-demographic characteristic was assessed using Student's *t*-test when two populations were being compared and one-way analysis of variance (ANOVA) when more than two populations were being compared. Pair-wise comparisons between individual groups were conducted by Tukey's HSD and Tamhane's T2 multiple comparison tests. The normality of sample distribution was assessed using Kolmogorov-Smirnov test.

Correlation between STAI and ISEL was computed by Pearson's correlation analysis while Spearman's rho correlation was applied between the outcome scores and each of STAI, ISEL and their subscales. The correlation between continuous variables was considered as small if the correlation coefficient fell within 0.10 and 0.29, moderate if between 0.30 and 0.49 and high if  $\geq 0.5$ . The limit of statistical significance was set at *p*-values  $< 0.05$ .

## Results

### Clinical-demographic characteristics

The 40 to 49 year age group contained the largest proportion of patients seen (40%) (Table I). The mean age of the 50 patients was  $47.2 \pm 12.5$  (range: 28 to 74) years. Females accounted for 84% and most patients (78%) had some form of tertiary education. Most patients were also married (62%) and in the middle income stratum (66%). Rheumatoid factor (RF) and anti-citrullinated protein antibodies (ACPA) were positive in 76% and 60% respectively. The proportion of patients in remission or low disease activity was 60% while 18% had high disease activity.

### STAI and ISEL scores compared with patient characteristics

The mean STAI-S, STAI-T and ISEL scores among the 50 patients were  $35.2 \pm 10.2$ ,  $36.7 \pm 8.8$  and  $87.2 \pm 21.2$  respectively. Pathological degrees of state and trait anxiety were found among 7 (14%) and 5 (10.4%) patients respectively. There was a significant association between STAI-S and level of education, marital status, history of ever smoking, functional class and disease activity ( $p < 0.05$  in each case, Table II). STAI-T was significantly associated with history of alcohol use, smoking, functional class and disease activity ( $p < 0.05$  in each case). The

ISEL score was only associated with the level of education ( $p = 0.001$ ) and the marital status ( $p = 0.001$ ).

Tamhane's T2 multiple comparison test showed a significant difference between the mean STAI-S scores of patients with no education and those with tertiary education ( $p = 0.006$ ). Similarly, pair-wise tests by Tukey's HSD showed significant differences in the mean ISEL scores between patients without any education and those with primary education ( $p = 0.038$ ), secondary education ( $p = 0.003$ ) as well as those with tertiary education ( $p < 0.001$ ) but not between patients with no education and those with post-graduate education ( $p = 0.079$ ). A significant difference in the mean STAI-S scores was found between patients who were separated and those who were married ( $p = 0.010$ ) but not between other categories of marital status.

The ISEL also differed significantly between the single and the separated patients ( $p = 0.018$ ) as well as between the married and the separated patients ( $p = 0.027$ ). A significant difference in the mean STAI-S scores across the functional classes was found between classes I and III ( $p = 0.011$ ). Comparing STAI-T between functional classes revealed significant differences between classes I and II ( $p < 0.001$ ) and between I and III ( $p < 0.001$ ).

As shown in Figure 1, there was a negative correlation between the STAI-T score and the ISEL score ( $r = -0.362$ ,  $p = 0.011$ ). However, the correlation between STAI-S and ISEL was not statistically significant.

### Relationship of outcome measures with STAI and ISEL scores

There was a statistically significant moderate-to-high correlation between each of STAI-S and STAI-T and all subscales and component summaries of SF-36 (Table III). Also, ISEL score correlated significantly with the RE ( $r = 0.377$ ,  $p = 0.008$ ), MH ( $r = 0.482$ ,  $p < 0.001$ ) and BP ( $r = 0.320$ ,  $p = 0.025$ ) domains and the MCS ( $r = 0.380$ ,  $p = 0.007$ ) of SF-36. HAQ-DI correlated strongly with both STAI-S ( $r = 0.735$ ,  $p \leq 0.001$ ) and STAI-T ( $r = 0.575$ ,  $p \leq 0.001$ ) but not with ISEL.

## Discussion

The biopsychosocial model of care is the clinical approach that has been recognized to provide the broadest and potentially most effective method for managing RA. The diversity of the impacts of the disease on the psychological and social wellbeing of the patient has led to emerging insights into these non-biological aspects of RA as they affect the HRQoL and probably the course of the disease. Our study found a mean state anxiety score of 35.2 and trait anxiety score of 36.7. These values are

**Table I.** Demographic and clinical characteristics of patients

Characteristics	Frequency <i>n</i> = 50	Percentage
Age group (years)		
20–29	2	4
30–39	11	22
40–49	20	40
50–59	6	12
60–69	9	18
70–79	2	4
Gender		
Female	42	84
Male	8	16
Level of education		
No formal education	2	4
Primary education	2	4
Secondary education	4	8
Tertiary education	39	78
Post-graduate education	3	6
Marital status		
Single	3	6
Married	31	62
Divorced	5	10
Widowed	7	14
Separated	4	8
Occupation		
Civil servant	22	44
Trader	14	28
Artisan	6	12
Clergy	1	2
Retired	4	8
Unemployed	3	6
Socio-economic status		
Low income	15	30
Middle income	33	66
High income	2	4
Tribe		
Yoruba	34	68
Igbo	9	18
Hausa	1	2
Others	6	12
Religion		
Christianity	44	88
Islam	6	12

Characteristics	Frequency <i>n</i> = 50	Percentage
Alcohol consumption		
Yes	8	16
No	42	84
Ever smoked?		
Yes	7	14
No	43	86
Functional class		
I	17	34
II	21	42
III	8	16
IV	4	8
Rheumatoid factor		
Positive	38	76
Negative	12	24
ACPA		
Positive	30	60
Negative	20	40
Methotrexate use	41	82
Hydroxychloroquine use	25	50
Sulfasalazine use	16	32
Prednisolone use	44	88
CDAI		
Remission	6	12
Low disease activity	24	48
Moderate disease activity	11	22
High disease activity	9	18

*N* – number; ACPA – anti-citrullinated protein antibody; CDAI – Clinical Disease Activity Index

similar to the findings of Rogers et al., who found values of 35.3 and 38.4 respectively among Columbian patients who were also recruited by the ACR/EULAR 2010 classification criteria [17].

While we found a pathological level of state anxiety among 14% and trait anxiety among 10.4% of the patients, the two components are similar to the overall prevalence of anxiety of 13.5% found by Covic et al. in Australia [9]. The absence of major differences in the degrees of anxiety in our study as compared with the patients studied in Columbia and Australia may be indicative of probably a more potent contribution of the RA itself to the anxiety than the specific genetic or environmental attributes of the patients which are independent of RA.

**Table II.** Relationship between patients' characteristics and STAI and ISEL scores

Factors	STAI-S mean (SD)	<i>p</i>	STAI-T mean (SD)	<i>p</i>	ISEL mean (SD)	<i>p</i>
Gender						
Male	32.0 (4.4)	0.109	40.9 (6.4)	0.142	79.6 (25.5)	0.274
Female	35.8 (10.9)		35.9 (9.0)		88.9 (20.9)	
Duration of disease						
Less than 2 years	36.9 (11.6)	0.365	37.5 (8.6)	0.662	83.0 (15.6)	0.323
2 years or longer	34.2 (9.4)		36.3 (8.9)		89.0 (24.1)	
Level of education						
None	39.0 (2.1)	0.010	41.0 (2.2)	0.107	31.1 (5.1)	0.001
Primary	52.0 (7.1)		48.5 (9.2)		84.5 (7.8)	
Secondary	46.5 (6.4)		41.0 (8.1)		91.0 (20.8)	
Tertiary	33.2 (9.7)		36.0 (8.6)		91.1 (19.1)	
Postgraduate	32.3 (4.6)		29.3 (7.5)		74.7 (11.0)	
Marital status						
Single	31.3 (2.9)	0.023	32.7 (2.3)	0.182	99.7 (5.8)	0.001
Married	33.7 (10.4)		35.5 (9.8)		96.0 (12.6)	
Divorced	35.0 (7.0)		39.4 (9.4)		67.8 (26.7)	
Widowed	34.3 (9.1)		36.3 (3.6)		72.9 (32.9)	
Separated	51.0 (1.2)		46.0 (2.3)		65.0 (9.2)	
Socio-economic status						
Low income	34.8 (11.6)	0.720	35.3 (9.4)	0.645	80.4 (24.2)	0.144
Middle income	35.0 (10.0)		37.6 (8.7)		89.0 (18.3)	
High income	41.0 (2.1)		34.0 (8.8)		109.0 (4.2)	
Do you drink alcohol?						
Yes	37.6 (15.1)	0.465	45.8 (7.1)	0.005	99.2 (5.8)	0.226
No	34.7 (9.2)		35.4 (8.2)		85.6 (22.6)	
Ever smoked?						
Yes	44.7 (15.9)	0.006	47.0 (6.3)	0.001	92.1 (14.0)	0.514
No	33.6 (8.2)		35.0 (7.9)		86.4 (22.8)	
Functional class						
I	29.8 (4.3)	0.001	30.9 (4.9)	0.001	95.1 (10.5)	0.121
II	35.8 (11.1)		39.5 (7.2)		88.7 (21.5)	
III	46.3 (9.8)		45.4 (4.8)		75.9 (13.5)	
IV	32.5 (7.5)		30.5 (12.1)		73.5 (49.1)	
Disease activity						
Remission or low disease activity	30.6 (5.6)	0.001	34.5 (7.5)	0.040	89.1 (17.6)	0.484
Moderate or high disease activity	42.1 (11.7)		39.8 (9.7)		84.4 (26.0)	

STAI-S – state anxiety; STAI-T – trait anxiety; ISEL – Interpersonal Support Evaluation List

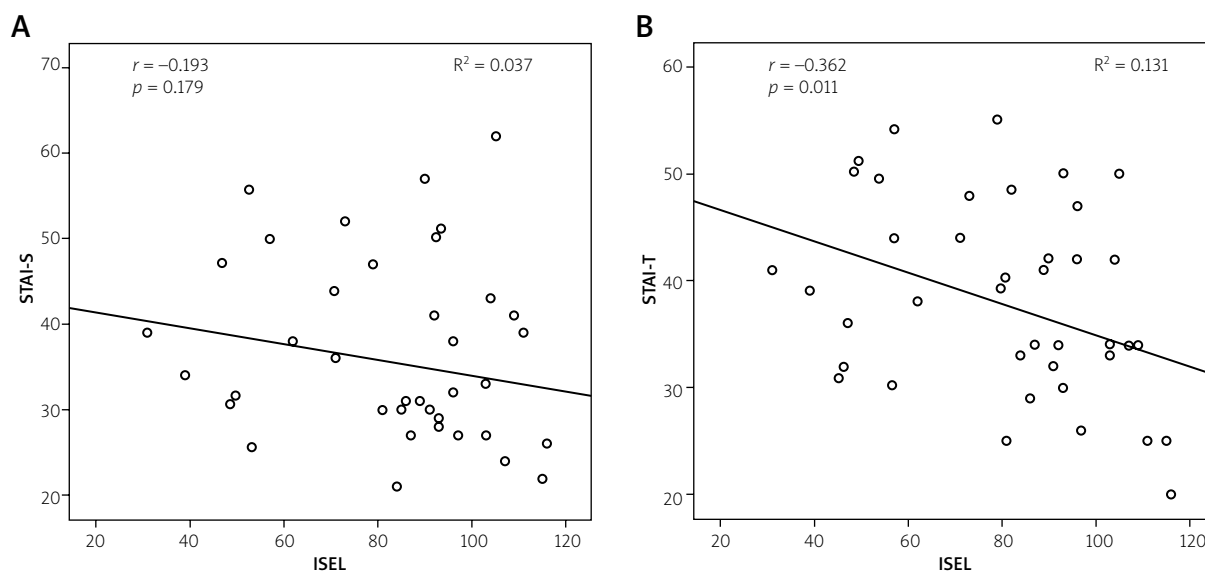


Fig. 1. Correlations between STAI and ISEL.

Table III. Spearman’s rho correlation between outcome measures and the measures of anxiety and perceived social support

	Mean (SE)	STAI-S	STAI-T	Appraisal	Tangible	Self-esteem	Belonging	ISEL
HAQ-DI	0.9 (0.1)	0.735***	0.575***	-0.204	-0.344*	-0.267	-0.136	-0.159
PF	62.7 (4.4)	-0.425**	-0.308*	0.088	0.208	0.158	0.041	0.140
RP	56.6 (6.8)	-0.393**	-0.525***	0.248	0.269	0.277	0.104	0.250
RE	61.9 (6.2)	-0.312*	-0.469**	0.385**	0.402**	0.342*	0.230	0.377**
VT	60.7 (2.4)	-0.543***	-0.606***	0.166	0.280	0.139	0.241	0.228
MH	69.2 (2.4)	-0.535***	-0.527***	0.393**	0.502***	0.446**	0.409**	0.482***
SF	60.2 (4.3)	-0.569***	-0.408**	0.226	0.302*	0.259	0.043	0.234
BP	54.9 (3.9)	-0.433**	-0.333*	0.223	0.352*	0.345*	0.235	0.320*
GH	58.9 (3.2)	-0.378**	-0.554***	0.149	0.239	0.297*	0.224	0.250
PCS	58.3 (3.9)	-0.472**	-0.509***	0.218	0.310*	0.310*	0.161	0.277
MCS	63.0 (3.3)	-0.525***	0.553***	0.354	0.427**	0.349*	0.239	0.380**

\*correlation is significant at the 0.05 level, \*\*at the 0.01 level, and \*\*\*at the 0.001 level; STAI-S – state anxiety; STAI-T – trait anxiety; ISEL – Interpersonal Support Evaluation List; HAQ-DI – Health Assessment Questionnaire-Disability Index; PF – physical functioning; RP – role physical; BP – bodily pain; GH – general health; VT – vitality; SF – social functioning; RE – role emotional; MH – mental health; PCS – physical component summary; MCS – mental component summary

The estimated prevalence of anxiety in the general African population is 4.4% [18]. Keeping this in mind, our findings imply that not only is anxiety more common in RA, but it also tends to be associated with some RA-specific characteristics such as disease activity (state and trait) and functional class (trait). The amount of perceived social support enjoyed by the patients is associated with their level of education and marital status. Patients at the two extremes of education levels (none and post-graduate) had the least social support. Since socio-economic status also tends to be poorest among uneducated Ni-

gerians, the financial strain on the family may impair the dedication of adequate support to the patient. However, among the patients with the highest levels of education, the decline of perceived social support may be attributable to the important positions of these individuals and probably their caregivers in their occupations and society. The demands of work and high societal relevance may prevent these patients from enjoying as much of the needed support as they would have wanted.

Importantly, our study may have identified a need to examine whether the anxiety experienced by a pa-

tient may alter the way they perceive the social support available to them. While we found a negative correlation between trait anxiety, a personality attribute that tends to be fairly stable, and perceived social support, a form of assistance that may vary over time, we did not find a significant correlation between state anxiety (a momentary apprehensiveness) and perceived social support. Examining this disparity in the associations may give some weight to the reasoning that trait anxiety, more importantly than situational state anxiety, affects the patients' perception of the social support they enjoy. In fact, previous studies have suggested higher levels of trait anxiety among patients with RA [19, 20].

In line with the observations of Strating et al. [21], we did not find any association between the levels of anxiety and the duration of disease. The level of anxiety among the patients with the most advanced functional disability who have likely had the longest duration of disease is significantly lower than that in functional classes II and III. During the course of RA, the patients tend to attain a level of mental state in which they have learned to cope better with the psychological distress due to their disease [7]. At this stage, despite the higher prevalence of accrued damage and physical disability, the anxiety levels are not as high. Indeed, a longer duration of disease has been associated with improved mental HRQoL [22].

We observed that both types of anxiety have significant correlations with every domain of SF-36. Furthermore, the damage index is strongly correlated with anxiety. This is consistent with the reports of earlier studies [23, 24]. Similarly, anxiety scores have been associated with higher disease activity and markers of inflammation [25]. On the other hand, we found that the ISEL score correlated significantly with the MCS but not the PCS. The MCS is calculated from the MH, RE, SF and VT, and while the ISEL was found to show significant correlations with MH and RE, it did not exhibit the same association with VT or SF. It stands to reason that the mental quality of life of the patient with good social support may indeed be better, and this is supported by previous studies [26, 27]. However, despite some advantage that may be experienced in the aspect of bodily pain by patients with good social support, the overall physical HRQoL was not significantly affected. Kojima et al. [27] found a similar result among Japanese patients, and it was identified that social support goes further to independently predict mental HRQoL when other factors were controlled for.

The HAQ-DI did not show a significant correlation with ISEL in our study, a pattern similar to an earlier report by Strating et al. [28]. Conversely, lesser degrees of functional limitation were found among patients with

good social support in France [29]. The study however looked at the outcome in a much larger European sample of patients over a 3-year period.

Other studies have supported the positive impact of social support on overall long-term disability [30, 31]. Since the quality of social support is a factor that may change substantially at different times, a cross-sectional assessment of this aspect of the patient's life may not provide a reliable indication for a long-term outcome such as disability. While sustained social support may be associated with better HRQoL, addressing a patient's needs in terms of problem-solving support is crucial. The most benefit may be obtainable if emotional, social and practical support are given both by relatives and health workers [32].

Rheumatology practice is poorly established or even non-existent in many low-income African countries. In countries where there are rheumatologists, the overwhelming load of patients available to be attended to by the few rheumatologists often keeps the clinician's immediate attention away from the psychosocial aspects of rheumatic diseases. While this study is limited by the relatively small number of patients, it assesses the impact of state and trait anxiety for the first time on the HRQoL of West African patients with RA. It was also able to identify the place of perceived social support and its relationship with trait anxiety.

## Conclusions

The African patients with long duration of disease may have attained some positive adjustment to the psychological anguish of their disease and thus cope better. While trait anxiety exhibits a demonstrable relationship with the perceived social support, both state and trait anxiety have negative associations with the patient's quality of life and are also associated with more damage accrual. The mental quality of life of the patient may show a positive trend if quality social support is available to the individual, but it is unlikely that a similar trend will occur in terms of their physical health or disability.

## Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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*The authors declare no conflict of interest.*

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