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Relationship between Subjective Quality of Life and Major Depression among Outpatients with Rheumatoid Arthritis Attending a Nigerian Tertiary Health Institution

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ABSTRACT

Background: Rheumatoid arthritis is a chronic and debilitating immunological disorder that majorly affects joints with swollen and painful characteristics. These patient-reported symptoms worsen their quality of life, which may consequently, predispose them to having major depression.

Method: Using a simple random sampling, one hundred and eleven adult patients in the age range of 18 to 64 years with rheumatoid arthritis were cross-sectionally evaluated at the rheumatology Out-Patient Clinic of the Lagos State University Teaching Hospital. The socio-demographic questionnaire, WHO Composite International Diagnostic Interview (CIDI), World Health Organization Quality of Life Scale Short Form (WHOQOL- BREF) were administered to participants to obtain their demographic/clinical variables, make diagnosis of depressive disorder and assess their subjective quality of life respectively.

Results: About one-third (n=33; 29.7%) of the participants reported having current depressive disorder. None of the tested variables after controlling for the cofounders was found to be an independent risk factor for current depression among the participants

Conclusion: The prevalence of major depressive disorder is high among individuals with rheumatoid arthritis, and specialists managing this population should routinely screen for depression in patients with rheumatoid arthritis.

Keywords
Major depression, Quality of life, Rheumatoid Arthritis, Nigeria.

Introduction
Rheumatoid arthritis is a long lasting disorder that prominently affects joints and it is typically characterized by warmth, fatigue, swollen and painful joints [1]. These patient-reported outcomes or symptoms worsen the disease physical disability and their quality of life, which in turn heightens the risk of depressive disorder [2,3]. The cause of rheumatoid arthritis is not clear; it is believed to involve a combination of genetic and environmental factors. The underlying mechanism involves the body's immune system attacking the joints [4]. Rheumatoid arthritis affects between 0.00-2.70% of the adults globally with a point prevalence of 51 in 10,000 and 7.0% in Netherlands and 5.0% in Nigeria [5-7]. Onset is most often during middle age and women are affected at least twice as frequent as men [8].

Depression ranked the most common mental health comorbidity among persons with rheumatoid arthritis and worsens their quality of life [9]. Depression in rheumatoid arthritis is associated with increased suicidal risk and mortality [10,11]. Studies using self-report measures of depressive symptoms suggest considerably higher rates, although the levels of symptomatology may be subclinical [12]. In rheumatoid arthritis, depression not only contributes its own additional burden but also interacts with the way patients perceive and cope with their physical illness and how they interact with the rheumatologist and general practitioner [13,14].

The physical disability caused by rheumatoid arthritis is usually evident at clinical level; however, the psychological and social morbidities easily evade the eyes of the clinician [15]. The problem of under treatment of depressive disorder in persons with arthritis is exacerbated by the misconception that depression is understandably occurring secondary to the pain and disability, so treatment of the depression is neither appropriate nor necessary [16]. The need to diagnose and treat those patients who experience depression is now widely accepted, since it has been demonstrated that depression can increase disability, result in poor medication adherence and interferes with optimal treatment [4,17,18]. In addition, evidence has shown that poor quality of life among individuals with rheumatoid arthritis is associated with increased health-care resource utilization such as high hospitalization rate, and clinic visitations [19]. Therefore, there is need to understand the relationship between quality of life of patients with rheumatoid arthritis and depressive illness.

Monitoring of people's health at the national level has traditionally focused on morbidity and mortality measures and reportable infectious diseases. However, these measures do not take into consideration the health-related quality of life (HRQOL) which provides a broader view of daily living activity and subjective well-being [20]. The relationship between rheumatoid arthritis and depression among African black subjects has not been definitive [21]. It is hoped that the research findings from this study will help in making and shaping informed decisions aimed at planning effective strategies for screening and identifying arthritis patients who have depression and instituting appropriate management to improve overall quality of life among such individuals. The study assessed the prevalence of current depression among patients with rheumatoid arthritis and to explore the association of depressive disorder and subjective quality of life of individuals with rheumatoid arthritis.

Methods
Study design and setting
This study was a cross-sectional descriptive study carried out at the rheumatology Out-Patient Clinic of the Lagos State University Teaching Hospital. The Lagos State University Teaching Hospital is located in Ikeja, capital of Lagos State in the South-West geopolitical zone of Nigeria.

Study population
One hundred and eleven patients who were receiving care for rheumatoid arthritis at the rheumatology outpatient's clinic of Lagos State University Teaching Hospital were recruited for this study. Patients aged between 18years and 64years diagnosed with rheumatoid arthritis who were not in severe painful distress and consented to participate were included, while patients undergoing treatment for depressive illness prior to onset of arthritis were excluded from the study.

Instruments
Socio-demographic Questionnaire
The researchers designed a socio-demographic questionnaire that comprises the demographic and clinical variables like gender, age, religion, level of education, occupation, marital status, place of domicile, living status and who accompanied the patient to the hospital, number of years since diagnoses was made, previous treatment if any, previous hospital admissions and presence of co-morbidity.

WHO Composite International Diagnostic Interview (CIDI)
The CIDI is a fully structured diagnostic interview that can generate diagnosis according to both DSM IV and International Classification of Diseases (ICD-10) [22]. It was developed as a collaborative project between the WHO and the US National Institute of Health. As the most widely used structured interview in the world, the CIDI allows the investigator to measure the prevalence of mental disorders, including depressive disorder. It is scored as 1 for "endorsed," 5 for "not endorsed," "8 for refused," and 9 for "don't know." The computerized scoring algorithm gives a diagnosis according to ICD-10 or DSM-IV. The CIDI has been used in Nigeria [23].

World Health Organization Quality of Life Scale Short Form (WHOQOL- BREF)
The WHO QOL–BREF instrument comprises of 26 items, which measure the following broad domains, physical health, psychological health, social relationship, environment and general facet on health and QOL [24]. The WHO QOL-BREF could be self-administered if respondents have sufficient ability otherwise interviewer administered form should be used. The four domain scores denote an individual's perception of quality of life in each particular domain. Domain scores are scaled in a positive direction (i.e. higher scores denote higher quality of life).

The mean score of items within each domain (derived by: Total score divided by number of items) is used to calculate the domain score. The mean scores are then multiplied by 4 in order to make domains scores comparable with the scores used in the WHO QOL-100, for the 4-20 range score, then convert to 0-100 scale. The WHO QOL scores in this study were classified as "good", "fair" or "poor". These scores being designated as greater than the mean score +1 standard deviation, between the mean +1 standard deviation and the mean -1 standard deviation, and less than the mean –1 standard deviation respectively.

Ethical Consideration
Permission for this study was obtained from the ethics committee of the Lagos State University Teaching Hospital Ikeja. Each participant was duly informed of the nature and purpose of the

study and assured of confidentiality, thereafter written informed consent was obtained.

Sample size and sampling method
The minimum sample size was determined using WINPEPI 11.64 computer software, with level of significance set at 5%, a sample proportion of 0.07 [6] and study power at 95%. One hundred and eleven (N=111) participants were interviewed via simple random sampling.

Statistical analysis
The data collected was analysed using the Statistical Package for Social Sciences version 22 (IBM SPSS version 22.0 Armonk, NY: IBM Corp). Chi-square test was used to assess the relationship between current major depression and the categorical variables. While Mann-Whitney U test was used to assess the relationship between the continuous variables (age, duration of illness, and WHO QoL parameter scores) and major depression.

The independent correlates of depression among the significant variables were determined using the logistic regression model (diagnosis of major depression as the dependent variable). Statistical significance was set at $p < 0.05$. All tests were two tailed.

Results
The mean age of the participants was 45.67years (±11.2), and they were predominantly females (n = 80; 72.1%). Slightly more than half of them (n = 58; 52.3%) were married or co-habiting (Table 1). About two-thirds (n = 73; 65.8%) were employed, and thirty-nine (35.1%) of the participants did not attain up to secondary level of education (Table 1).

Table 1: The socio-demographic and clinical characteristics of participants.

Variable	Categories	N= 111(%)
Age	20 – 49 years	68 (61.3)
	50 – 64 years	43 (38.7)
	Mean age (SD)	45.67 (11.2)
Gender	Male	31 (27.9)
	Female	80 (72.1)
Marital Status	Never married	30 (27.0)
	Married/co-habiting	58 (52.3)
	Separated/widow(er)/ divorced	23(20.7)
Employment Status	Employed	73 (65.8)
	Unemployed	38 (34.2)
Educational Status	Less than secondary	39(35.1)
	At least secondary	72(64.9)
Religion	Christianity	84 (75.7)
	Islam /Traditional	27 (24.3)
Living Alone	Yes	7 (6.3)
	No	104 (93.7)
Accompanied to Clinic	Yes	42 (37.8)
	No	69 (62.2)
Number of years since diagnosis	< mean	59 (53.2)
	> mean	52 (46.8)
	Mean (SD)	9.88 (7.44)
Previous treatment	Yes	89 (80.2)
	No	22 (19.8)
physical comorbidity	Yes	32 (28.8)
	No	79 (71.2)

About one-third (n = 33; 29.7%) of the participants reported having current depressive disorder. Table 2 shows the pattern of quality of life of participants, only about one in five had a good total quality of life (n = 19; 17.1%).

Participants who were unemployed (p <0.013), having less than a secondary level of education (p <0.01), who were accompanied to the clinic (p <0.001), had a history of previous treatment (p <0.001) were more likely to report current depressive illness (Table 3). All WHO-QOL Brief variables had statistically significant association with current depression among the participants (Table 4).

The significant socio-demographic and clinical correlates of major depression from bivariate analysis (pain, illness duration, education, total quality of life, overall quality of life facet, physical, psychological and social health domains) were entered into a binary logistic regression analysis to determine predictors of major depression (present/absent). No variable was found to be an independent risk factor for current depression among participants (Table 5).

Discussion
The current prevalence of depression among participants with rheumatoid arthritis in this study was 29.7%. This is within range of earlier reported prevalence of depressive disorder among persons with rheumatoid arthritis globally, the lowest being 5 % in Nigeria, Japan and highest value of 75.8% in Poland [7,25,26]. The closest prevalence rates to this study's finding were 28.4% by Doshi et al. [1] and 29.6% by Sautner et al. [18]. However, the depression frequency in this study was lower than recent evidences, 42.9%, 45%, 54%, 70.8%, and 75.8% across the globe [17,21,26-28].

On the contrary, this work found a prevalence rate higher than previously reported studies, 5% and 10.6% within Nigeria and across different geographical areas of 12.2% among Scottish and 12.5% in Thailand [7,8,29,30]. Also interesting to note, is that meta-analytic studies showed divergent prevalence rates of 15% and 65.6% [31,32]. These inconsistent results may be explained by variations in methodology such as the study design and setting, sample, diagnostic or screening tools for depression and geographical differences. Secondly, the watershed of some vegetative depressive symptoms in rheumatoid arthritis such as sleep disturbances, anorexia, weight loss, anergia may add to the variation in prevalence of major depressive disorder among individuals with rheumatoid arthritis.

The bidirectional relationship between depressive disorder and poor subjective quality of life among persons with rheumatoid arthritis has been noted in the literature [33]. This study found lower scores of all QOL facets and domains to be significantly associated with the diagnosis of current depression in the bivariate analysis. However, after controlling for confounding factors the total quality of life and its various domains ceased to have a contributing risk factor for depression. This is contrary to research evidence that reported a significant association between subjective

Table 2: The pattern of quality of life.

Quality of Life facet and domain	Good n (%)	Fair n (%)	Poor n (%)	mean	SD
Total QOL	19 (17.1)	67 (60.4)	25 (22.5)	78.28	17.46
Overall QOL facet	2 (1.8)	79 (71.2)	30 (27.0)	3.12	1.06
General Health Facet	25 (22.5)	74 (66.7)	12 (10.8)	2.20	0.93
Physical Health	23 (20.7)	67 (60.4)	21 (18.9)	53.76	19.76
Psychological Health	30 (27.0)	57 (51.4)	24 (21.6)	47.02	19.28
Social Relationship	7 (6.3)	72 (64.9)	32 (28.8)	53.95	22.68
Environmental health	16 (14.4)	80 (72.1)	15 (13.5)	50.65	13.87

Table 3: Socio-demographic and clinical correlates of current depression among the participants.

Variables		Current Depression			
		Present n (%)	Absent n (%)	χ^2	p-value
Gender	Male	6 (18.2)	25 (32.1)	2.216	0.137
	Female	27 (81.8)	53 (67.9)		
Marital Status	Currently Married	12 (36.4)	44 (56.4)	3.728	0.054
	Single/Widow (er)	21 (63.6)	34 (43.6)		
Employment Status	Employed	16 (48.5)	57 (73.1)	6.229	**0.013**
	Unemployed	17 (51.5)	21 (26.9)		
Educational status	Less than Secondary	18 (54.5)	21 (26.9)	7.763	**0.01**
	At least Secondary	15 (45.5)	57 (73.1)		
Religion	Christianity	24 (72.7)	60 (76.9)	0.222	0.638
	Islam/Others	9 (27.3)	18 (23.1)		
Living Alone	Yes	4 (12.1)	3 (3.8)		0.193#
	No	29 (87.9)	75 (96.2)		
Accompanied to Clinic	Yes	21 (63.6)	21 (26.9)	13.289	**0.001**
	No	12 (36.4)	57 (73.1)		
Previous Treatment	Yes	33 (100)	56 (71.8)		**0.001#**
	No	0 (0)	22 (28.2)		
Co-morbidity	Present	12 (36.4)	20 (25.6)	1.299	0.254
	Absent	21 (63.6)	58 (74.4)		

Key: # Fisher's exact p value
p < 0.0

Table 4: Socio-demographic and clinical correlates of current depression among participants (continuous variables).

Variable	Current Depression	MR	MWU Test	p-value
Age	Present	65.30	980.000	**0.047**
	Absent	52.06		
No. of years since diagnosis	Present	69.61	838.000	**0.004**
	Absent	50.24		
WHOQOL score	Present	17.53	17.500	**0.001**
	Absent	72.28		
Overall QOL score	Present	24.52	248.000	**0.001**
	Absent	69.32		
General Health facet	Present	22.33	176.000	**0.001**
	Absent	70.24		
Physical Health Domain	Present	18.97	65.000	**0.001**
	Absent	71.67		
Psychological Health Domain	Present	19.29	75.500	**0.001**
	Absent	71.53		
Social Health Domain	Present	20.85	127.000	**0.001**
	Absent	70.87		
Environmental Domain	Present	22.58	184.000	**0.001**
	Absent	70.14		

Key: MR = Mean Rank; MWU = Mann-Whitney U
Bold figures in p value column indicate statistically significant results at p < 0.05

Table 5: Independent correlates of current depression among participants.

Variable	B	S.E	Sig	O R
Education	4.354	26848.963	1.000	77.762
Duration of illness	2.257	538.712	0.997	9.552
Pain	34.537	3750.008	0.993	9.978
Total quality of Life	-10.961	3803.785	0.998	0.000
Overall quality of Life facet	7.793	21553.563	1.000	2422.893
Physical health domain	1.125	1536.481	0.999	3.081
Psychological health domain	6.305	906.026	0.999	547.233
Social health domain	0.293	414.898	0.999	1.340
Constant	258.451	111995.287	0.998	1.753

Key: B: Regression Coefficient; S.E: Standard Error of Regression; OR: Odd Ratio; Sig: Level of Significance (p-value).

quality of life and depression among patients with rheumatoid arthritis [25,29,31,33,36]. Possible explanation could be attributed to use of screening tools to elicit depressive symptoms against the standard diagnostic instrument employed in this study to diagnose depressive disorder. In addition, we evaluated the participants' subjective quality of life with a more robust WHOQOL- BREF tool, unlike the Health Assessment Questionnaire (HAQ) adopted by most studies.

Socio-economic (education, employment etc.) and patient (gender, age, coping styles etc.) factors were among the contributing predictors for depression in rheumatoid arthritis [34]. Researchers have shown that females with rheumatoid arthritis have more depressive disorder than their male counterparts and this is in tandem with the outcome of this study, maybe because of the female gender predominance in rheumatoid arthritis and better health-seeking behaviour among females since this study was conducted in a clinical setting [3,4,7,27,30, 35].

Studies have opined inconsistent results with respect to association between age of patients with rheumatoid arthritis and having major depression. This study found that older participants were significantly more likely to report depressive illness, unlike previous published studies who observed a link between younger age and depression among their studied population [25,28,29,33]. Our findings could be because the physical disability owing to chronicity of the disease in the older age, often leads to prominent negative affect and consequently depressive illness. However, a recent meta-analytic result revealed no relationship between age and having depressive disorder [32].

Lower educational attainment and being unemployed were significant correlating factors for major depression in this work. This corroborated previous findings. For instance, Lapecevic et al. [36] opined that both unemployed-capable to work and the disabled-unemployed due to rheumatoid arthritis; and those who attained only secondary level of education were significant predictors of depression in rheumatoid arthritis population. Similarly, Margaretten et al. [34] and Sruamsiri et al. [25] revealed that low income and educational achievement were linked to major depression. According to social causation theory of depression, the low socio-economic status (i.e. low levels of income, employment, and education) is recognisable risk factors for major depression [37].

Long duration of illness could mean chronicity, which may lead to overwhelming psychological stress and could account for the outcome of this study that showed depressive illness was higher among those who had long duration of the arthritis. This is in keeping with what was reported in earlier literature and contrary to Jamshidi et al. finding [32,36].

It is noteworthy that, patients who were accompanied to clinic by their relatives or significant others significantly reported having major depression in this study. Ordinarily one would assume that those who were accompanied to their clinic signify a good social support. Nevertheless, accompanying them to clinic maybe indicating the degree of illness severity or and high physical disability index, snowballing to poor quality of life hence having depression as a complication.

A prospective study design will be necessary to show a definitive causative relationship between depressive disorder and subjective quality of life in persons with rheumatoid arthritis, which was a limitation in this study. Secondly, this was a single-centred study; hence, generalization of the result is limited. Major depressive disorder is common among patients with rheumatoid arthritis. Most demographic and clinical factors had no independent predictive role in having depressive disorder among individuals with rheumatoid arthritis.

Ethical Consideration
The study was submitted and approved by the Ethical Committee of the Lagos State University Teaching Hospital (LASUTH). The nature and the purpose of the study were explained to all participants who signed the informed consent form before they were recruited into the study.

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