Anxiety and depression regression and correlation as to rheumatoid arthritis patients' clinical and sociodemographic characteristics

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Background
Studying anxiety and depression correlates to rheumatoid arthritis (RA) patients' clinical and sociodemographic characteristics is rare in Egypt, so it is necessary to conduct this study.
Results
In total, 40 patients in rheumatology clinics of the Faculty of Medicine, Helwan University, assessed by International Classification of Diseases Version 10 symptom checklist and disease activity score 28, rendered a positive correlation between BMI and depression; regression of anxiety over the level of education; also regression of depression over the presence of comorbidity.
Conclusion
BMI, the presence of comorbidities, and level of education with RA relate to the presence of anxiety and depression in patients with RA.

Keywords:
anxiety, depression, rheumatoid arthritis

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Background

Prevalence of anxiety and depression in patients with rheumatoid arthritis (RA) varies in studies in different countries and different decades. Matcham *et al.* (2013), in a meta-analysis of 72 studies that included 13 189 patients with RA, found a pooled prevalence of major depression of 17% (range: 3–75%) (Matcham *et al.*, 2013). Katchamart *et al.* (2020) in a multicenter prospective cross-sectional study, including 464 patients, found that 12.5 and 14.5% of patients with RA had depression and anxiety, respectively (Katchamart *et al.*, 2020). Jamshidi *et al.* (2016) found an 84% prevalence of anxiety among Iranian patients with RA (Jamshidi *et al.*, 2016).

Mental and physical health states have mutual influence over each other. Machin *et al.* (2020), in a systematic review and meta-analysis, including 20 studies involving 7452 people with RA, found that anxiety was associated with increased RA activity (Machin *et al.*, 2020). Rathbun *et al.* (2013), in a systematic review, found a bidirectional relationship between depression and RA activity (Rathbun *et al.*, 2013). Matcham *et al.* (2018), in an analysis of the British Society for Rheumatology Biologics Register, found that depressive symptoms in patients with RA were linked to a reduced improvement in disease activity score 28 (DAS28) over time, compared with patients without depression (Matcham *et al.*, 2018). Patients with RA having anxiety, depression, or both improve when physical and chemical therapies to RA improve their physical state. Jorm *et al.* (2017), in a review of the evidence from four countries, found that increased provision of treatment reduced the prevalence of common mental disorders (Jorm *et al.*, 2017).

Tucrck *et al.* (2017), in a study of the proteomic differences in blood plasma associated with antidepressant-treatment response, found that depression influences the disease process itself and not simply the self-rated impact of disease. This is no surprise given the known influences of depression and its treatments upon the immune system (Tucrck *et al.*, 2017). Lu *et al.* (2016), in a Taiwan nationwide longitudinal study of the bidirectional associations between RA and depression, found that RA activity and depressive symptoms are mutually associated and that systemic inflammation may cause or contribute to depressive symptoms (Lu *et al.*, 2016). Withers *et al.* (2017) explained that the direct effect of proinflammatory cytokines on the central nervous system, as well as the indirect effects of disease activity, such as pain, disability, loss of social life, and fear of disease progression, contributes to depression (Withers *et al.*, 2017).

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Margaretten *et al.* (2011) reported that sociodemographic and clinical variables have an impact on depression in patients with RA (Margaretten *et al.*, 2011). This study investigates these sociodemographic and clinical variables in an Egyptian sample. It could help in raising the index of clinical suspicion of the rheumatologist for early diagnosis and referral of patients with depression and anxiety among rheumatoid patients for psychiatric services.

Patients and methods

Participants

Sample selection: convenience sample of patients with RA following up in the Rheumatology clinic in Badr Hospital of Helwan University

Sample size: is calculated using Epi-Info program, version 6 (Centers for disease control and prevention in Atlanta, Georgia (US), 1998) assuming 95% confidence interval, 80% power of test; accordingly, the following equation is used:

$$n = (z/e) \times 2(p)(1-p).$$

n: the sample size, p: the expected prevalence, z: the critical value 1.96, e: the margin of sample error tolerated to 0.05.

The expected prevalence according to Matcham *et al.* (2013) is 3%. Therefore, the sample size was calculated to be 40 participants.

Tools

Participants were asked to complete the sociodemographic and clinical data sheet – age, sex, education, duration of illness, weight, height, presence of comorbid illnesses, and presence of joint deformities – ensured from clinic records as well.

The participants were interviewed by a psychiatrist and diagnosed according to the International Classification of Diseases Version 10 symptom checklist (Janca and Hiller, 1996).

The participants were examined by a rheumatologist and severity of illness assessed according to the DAS28.

Procedures

Study design survey design. Ethical approval: approval from the ethical committee of the Faculty of Medicine Helwan University was obtained. Written informed consent was given by participants. Data collection: time table: data collection lasted for 3 months beginning from the January 1, 2020 till the sample was completed. Settings: Rheumatology Clinic (Helwan University hospitals).

Statistical analyses

All analyses were performed on the Statistical Package for Social Sciences (SPSS, version 20.0; IBM, Armonk, New York, USA) (Nile *et al.*, 2011). Descriptive statistics (means and SDs or frequency and percentages) were calculated for the collected variables. Linear regression and Pearson's correlation were used to investigate regression and correlate variables.

Results

Psychosocial and clinical characteristics

Tabulated in Table 1. Females are 87.5% of sample. About 47.5% have higher education and 42.5% have school education. Deformity occurs in 32.5% of sample and comorbidity in 40% of sample. Anxiety occurs in 27.5% and depression in 20% of sample. Mean age is 43 years and mean disease duration is 6.73 years. Mean BMI is 30.12 and mean DAS28 is 3.54.

Regression and correlation of anxiety and depression as regards other variables

There is significant regression of anxiety as to educational level, while there is significant regression of depression as to the presence of comorbidity (Tables 2 and 3).

There is no significant correlation of anxiety as to age, duration of RA, BMI, and DAS28; while there is

Table 1 Psychosocial and clinical characteristics

Nonparametric variables	*n* (%)	
Sex		
Males	5 (12.5)	
Females	35 (87.5)	
Education		
Higher	19 (47.5)	
School	17 (42.5)	
Illiterate	4 (1)	
Presence of deformity	13 (32.5)	
Presence of comorbidity	16 (40)	
Presence of anxiety	11 (27.5)	
Presence of depression	8 (20)	
Parametric variables	Mean (SD)	Range
Age (years)	43 (4.82)	36–52
Duration of rheumatoid arthritis (years)	6.73 (1.98)	4–10
BMI	30.12 (3.09)	25–35
DAS28	3.54 (1.07)	2–5.2

DAS28, disease activity score 28.

significant regression of depression as to the duration of RA (Tables 4 and 5).

Discussion

In the present study, anxiety occurs in 27.5% and depression in 20% of sample (Table 1). This agrees with Matcham *et al.* (2013), in their meta-analysis of 72 studies that included 13 189 patients with RA, where they found a pooled prevalence of major depression of 17% (Matcham *et al.*, 2013). Butthis study disagrees with Jamshidi *et al.* (2016) who found an 84% prevalence of anxiety among Iranian patients with RA. The variation in findings between different studies could be explained by technical factors such as sampling methods and sizes, as well as different tools used in assessing rheumatoid severity and mental symptoms. Also, the variation between studies' findings could be explained to different sociodemographic and clinical services across different parts of the world. Further studies are needed to explore these hypotheses.In this study, females are 87.5% of sample. There is a statistically insignificant regression between sex and depression in this study, yet the *P* value is 0.084 (Table 3). Margaretten *et al.* (2011) reported that female sex is a risk factor for depression among patients with RA. Had the sample size been larger, a significant relation might have been evident.

In this study, there is significant regression of anxiety as to educational level (Table 2). This agrees with Margaretten *et al.* (2011) who reported that less formal education was also observed to be a risk factor for depression among RA patients. This also agrees with Zhang *et al.* (2017) who reported that low education levels are significantly associated with anxiety and depression in RA patients in a Chinese sample (Zhang *et al.*, 2017).

In this study, deformity occurs in 32.5% of sample and comorbidity in 40% of sample. There is significant regression of depression as to the duration of RA (Table 5). Katchamart *et al.* (2020) did a multivariate analysis that revealed global health score to be negatively associated with depression. There is significant regression of depression as to the presence of comorbidity in this study as well.

In Katchamart *et al.* (2020) study also, anxiety, and functional disability were significantly associated with increased anxiety. Abdul Rahim and Cheng (2018) reported that functional status was noted to be an important predictor of depression and anxiety in patients with RA in a Malaysian center.

In this study, there is significant regression of depression as to the duration of RA. In Katchamart *et al.* (2020) study also, disease duration of 10 years or more and global health score were significantly associated with decreased risk of developing anxiety. The longer the RA duration is, the less prone to anxiety are the patients and the more prone to depression.

Conclusion

BMI, the presence of comorbidities, and level of education with RA relate to the presence of anxiety and depression in patients with RA.

Table 2 Regression of anxiety as to sociodemographic and clinical variables (multinominal logistic regression)

	Anxiety	
	t	*P* value
Sex	0.160	0. 874
Educational level	–2.545	0.016*
Presence of deformity	–1.892	0.067
Presence of comorbidity	–0.386	0.702

Table 3 Regression of depression as to sociodemographic and clinical variables (multinominal logistic regression)

	Depression	
	t	*P* value
Sex	–1.781	0.084
Educational level	0.420	0.677
Presence of deformity	0.688	0.496
Presence of comorbidity	2.146	0.039*

Table 4 Correlation of anxiety as to sociodemographic and clinical variables (Pearson correlation)

	Anxiety	
	r	*P* value
Age (years)	–0.143	0.379
Duration of rheumatoid arthritis (years)	–0.006	0.969
BMI	–0.225	0.163
DAS28	0.08	0.624

DAS28, disease activity score 28.

Table 5 Correlation of depression as to sociodemographic and clinical variables (Pearson correlation)

	Depression	
	r	*P* value
Age (years)	–0.025	0.876
Duration of rheumatoid arthritis (years)	–0.303	0.05*
BMI	0.258	0.108
DAS28	0.156	0.337

DAS28, disease activity score 28.

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Conflicts of interest

There are no conflicts of interest.

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