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ORIGINAL ARTICLE

Assessment of Depression and Anxiety in Patients with Fibromyalgia

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Context	Fibromyalgia syndrome (FMS) is a persistent pain, exhaustion, sleep disruption, and poor quality of life and daily performance disorder.
Aims	Examine depression and anxiety in fibromyalgia patients, as well as its relationship to illness severity.
Settings and Design	A case control study.
Subjects and methods	This case control research comprised ninety fibromyalgia patients and ninety healthy controls. Anxiety and depression were measured utilizing the Hospital Anxiety and Depression Scale (HADS). HADS were employed to evaluate depression and anxiety, which were clinically identified using Diagnostic and Statistical Manual Of Mental Disorders, 5th Edition (DSM-5) criteria.
Results	We found that older age, higher tender point count (TPC), higher symptom severity score, fibromyalgia impact questionnaire (FIQ), and unmarried patients were substantially associated with greater prevalence of depression among fibromyalgia patients. In terms of HADS anxiety and depression, we discovered a substantial variation between the groups.
Conclusions	Patients with FMS need mental assistance. Biological, psychological, and social techniques should all be used in treatment.
Keywords	Anxiety, Chronic pain, Depression, Fibromyalgia.

INTRODUCTION

Fibromyalgia syndrome (FMS) is defined by the American College of Rheumatology (ACR) as extensive pain that last more than three months (in the axial skeleton, on both sides of the body, and above and below the waist) and sensitivity to pressure in at least 11 of the body's 18 locations. FMS is treated with painkillers, antidepressants, myo-relaxants, and sleeping drugs, although these medications aren't always successful. FMS is a common source of persistent pain that has been related to psychological issues. At least 30% of people with persistent pain suffer from serious depression, and another 30% have panic or generalized anxiety disorder (Bellato *et al.,* 2012).

FMS is a functioning condition marked by extensive pain and a slew of other signs such as cognitive impairment, exhaustion, sleep disturbances, a lowered pain threshold, and morning stiffness. FMS has been linked to aberrant endogenous pain regulation, decreased hypothalamic-pituitary-adrenal axis (HPA) function, and immune system anomalies (Fitzcharles and Yunus, 2012).

A past family history of FMS, in addition to gender and age, enhances the likelihood of developing this disorder. As a result, this points to a combined genetic and lifestyle cause, however the actual cause remains unclear. Previous research looked at the altered pain response, revealing

persistent and enhanced pain response to a painful stimulant (hyperalgesia) as well as pain induced by a stimulant that should not typically cause pain (hyperalgesia) (Sánchez *et al.,* 2019).

FMS is said to have a high prevalence of depression, prompting some to believe it is a depressive spectrum condition. In individuals with FMS, the occurrence of depressive symptoms is linked to considerable impairment: Indeed, mental co-morbidity reduces patients' pain thresholds and degrades their quality of life (Kamenov *et al.,* 2016).

Anxiety is a typical secondary symptom in fibromyalgia patients, and it is often severe. The incidence of these symptoms varies between 13 percent and 71 percent among individuals. Anxiety symptoms may have a negative impact on the disease's progression. Anxiety is linked to an elevated number of physical symptoms and a greater pain intensity in fibromyalgia patients, indicating that the condition is more severe (Clauw, 2014).

The Fibromyalgia Impact Questionnaire (FIQ) is utilized to examine the overall intensity of FMS, whereas the Hospital Anxiety and Depression Scale (HADS) is employed to examine anxiety and depression. However, these surveys only give minimal information on the severity of health anxiety. The assessment of health anxiety would aid in focusing on the source of worry, hence improving everyday activities and health-related life quality. Hypochondriasis is the greatest prevalent illness related to health anxiety; however, it may also be seen in other somatic symptom diseases (De Heer *et al.,* 2017).

Anxiety and depression are widespread in fibromyalgia patients, hence the goal of this research was to assess depression and anxiety in fibromyalgia patients, as well as their relationship to illness severity.

SUBJECTS AND METHODS

This case control study comprised fibromyalgia patients conducted from EL Demerdash hospital and El Maadi Military Hospital from October 2020 till April 2021.

Inclusion criteria:

The research included ninety age- and sex-matched controls diagnosed with fibromyalgia who were 18 years or older and met the ACR criteria (Wolfe *et al.,* 2011). One investigator evaluated all of the fibromyalgia patients.

Exclusion criteria:

Patients with comorbidities like rheumatoid arthritis, systemic lupus erythematous, osteoarthritis, chronic kidney disease and diabetes mellitus were excluded from the study if found after detailed clinical examination.

1. In addition, patients already on antidepressants and anxiolytics also patients with psychotic disorders or substance abuse disorders were excluded from the study.

2. Age and gender matched controls were recruited with the same exclusion criteria.

The intensity of fibromyalgia symptoms in the patients during the previous week was assessed using the Symptom Severity scale **(SS scale)**. In a nutshell, the SS scale is the total of three symptoms: exhaustion, waking unrefreshed, and cognitive problems, as well as the overall severity of somatic symptoms. The scale runs from 0 to 12, with greater values indicating more serious illness (Wolfe *et al.,* 2010).

Depression and anxiety were clinically diagnosed according to DSM 5 criteria and were evaluated utilizing **hospital anxiety and depression scale (HADS)**. HADS has seven questions each for anxiety and depression with maximum possible score of three for every question. Normal is a score of 0–7, borderline abnormal is 8–10, and abnormal is 11–21 (Olssøn *et al.,* 2005). Terkawi *et al.,* employed a systematic translation method to convert the original English HADS into Arabic (Terkawi *et al.,* 2017).

The validated Arabic version of fibromyalgia impact questionnaire **(FIQ)** was employed to determine the intensity of FMS. This questionnaire has ten subscales that examine physical performance, the number of days you've felt well, the number of days you've missed work, your ability to complete tasks, pain, weariness, rest, stiffening, anxiety, and sadness. The scale runs from 0 to 100, with a larger number denotes more disability and severity (Bennett, 2005). The tender point count (TPC) is a crucial component of the fibromyalgia syndrome (FMS) (Mcveigh *et al.,* 2007).

The FMS patients' socioeconomic status was measured according to the validated and updated Fahmy and EL Sherbini "Socioeconomic scoring system of Egyptian population" based on seven domains it is categorized into five classes (El Gilany *et al.,* 2012).

Statistical Analysis

Statistical analysis used:

The information was tallied as mean standard deviation (SD) or *n* (%) of patients. The Student's *t*-test was utilized to make between-group comparisons. The associations between the various scores were evaluated using Spearman's correlation coefficient analysis. SPSS® version 20.0 (SPSS Inc. Chicago, IL, USA) for Windows® was utilized to conduct statistical assessment. *P*-values <0.05 were deemed substantial.

Ethical approval:

This study was performed in line with the principles of the Declaration of Helsinki, and all methods were carried out in accordance with relevant guidelines and regulations. The study protocol was approved by the local ethical committee of the Armed Forces College of Medicine (AFCM) (No. V-G-IRB-01-010.) Written consent to participate was obtained from all subjects included in the study.

RESULTS

There was a substantial variation across the groups regarding sex, BMI, and socioeconomic status (Table 1).

There was a substantial variation across the groups regarding HADS anxiety and depression (Table 2).

There was a substantial variation across patients with anxiety and patients without with more incidence among patients with older age, lower education, low socioeconomic status, longer disease duration, and higher other scores (Table 3).

There was a substantial variation between patients with depression and patients without where depression is more prevalent among older age, higher BMI, lower education, lower socioeconomic status, unemployment, longer disease duration, and other disease scores (Table 4).

There was a substantial positive connection between symptom severity score with age, disease duration, depression score, anxiety score, FIQ and TPC (Table 5).

Unmarried patients were substantially related with a greater prevalence of anxiety among fibromyalgia patients, as was a higher symptom severity score, FIQ (Table 6).

Older age, higher TPC, higher symptom severity score, FIQ, and unmarried patients were substantially linked to increased frequency of depression between fibromyalgia patients (Table 7).

Table 1: Basal characteristics between the two groups:

Variables	Cases (n= 90)	Controls (n= 90)	P-value
Age (years)	44.37±7.12	43.53±6.58	0.412
Sex			
Male	4(4.4%)	24(26.7%)	<0.001*
Female	86(95.6%)	66 (73.3%)	
Weight (kg)	77.84±8.2	75.91±6.52	0.082
Height (cm)	163.66±9.63	162.21±12.56	0.386
BMI (kg/m^2)	29.02±3.05	27.91±3.56	0.026
Employment			
Employed	66(73.3%)	58(64.4%)	0.198
Unemployed	24(26.7%)	32(35.6%)	
Marital status			
Married	61(67.8%)	52(57.8%)	0.165
Unmarried	29(32.2%)	38(42.2%)	
Education			
Below university	51(56.7%)	58(64.4%)	0.287
University or higher	39(43.3%)	32(35.6%)	
Number of children	1.09±0.802	0.921±0.561	0.103
Socioeconomic status			
Very Low	23(25.6%)	10(11.1%)	0.043
Low	19(21.1%)	18(20%)	
Middle	26(28.9%)	27(30%)	
High	22(24.4%)	35(38.9%)	

*: Statistically significant.

Table 2: Clinical characteristics between the two groups:

Variables	Cases (*n*= 90)	Controls (*n*= 90)	*P*-value
Comorbidities, *n* (%)			
DM	28(31.1%)	17(18.9%)	0.058
HTN	21(23.3%)	12(13.3%)	0.083
IHD	10(11.1%)	8(8.9%)	0.619
Smoking	9(10%)	15(16.7%)	0.189
Duration of fibromyalgia (months)	11.95±5.9	--	--
FIQ	59.42±16.57	--	--
Symptom severity scale	8.76±1.54	--	--
TPC	13.5±1.72		
Anxiety, *n* (%)	81(90%)	--	
Depression, *n* (%)	73(81.1%)	--	
Hospital Anxiety and Depression Scale (HADS)			
HADS-anxiety	10.2±3.85	5.81±1.86	<0.001*
HADS-depression	8.57±4.36	4.13±1.82	<0.001*

*: Statistically significant.

Table 3: Patient characteristics among fibromyalgia patients according to anxiety presence:

Variables		Anxiety (*n*= 81)	No anxiety (*n*= 9)	*P*-value
Age (years)		45.56±6.1	33.67±6.96	<0.001*
Sex	Male	3(3.7%)	1(11.1%)	0.306
	Female	78(96.3%)	8(88.9%)	
BMI (kg/m^2)		29.22±2.97	27.17±3.26	0.055
Employment	Employed	57(70.4%)	9(100%)	0.057
	Unemployed	24(29.6%)	0	
Marital status	Married	53(65.4%)	8(88.9%)	0.153
	Unmarried	28(24.6%)	1(11.1%)	
Education	Below university	50(61.7%)	1(11.1%)	0.004*
	University or higher	31(38.3%)	8(88.9%)	
Socioeconomic status				
Very Low		23(28.4%)	0	0.015
Low		18(22.2%)	1(1.1%)	
Middle		24(29.6%)	2(22.2%)	
High		16(19.8%)	6(66.7%)	
Number of children		1.06±0.812	1.33±0.707	0.338
Duration of fibromyalgia (months)		12.38±5.73	7.56±5.9	0.019
FIQ		61.95±15.23	36.67±9.27	<0.001*
Symptom severity scale		8.52±2.27	5.76±1.88	<0.001*
TPC		13.7±1.68	11.67±0.866	0.001*
Depression, *n* (%)		71(87.7%)	2(22.2%)	<0.001*

*: Statistically significant.

Table 4: Patient characteristics among fibromyalgia patients according to depression presence:

Variables		Depression (*n*= 73)	No depression (*n*= 17)	*P*-value
Age (years)		46.45±5.64	35.41±5.78	<0.001*
Sex	Male	2(2.7%)	2(11.8%)	0.104
	Female	71(97.3%)	15(88.2%)	
BMI (kg/m^2)		29.5±2.94	26.93±2.64	0.001*
Employment	Employed	49(70.4%)	17(100%)	0.006
	Unemployed	24(32.9%)	0	
Marital status	Married	48(65.8%)	13(76.5%)	0.394
	Unmarried	25(34.2%)	4(23.5%)	
Education	Below university	49(67.1%)	2(11.8%)	<0.001*
	University or higher	24(32.9%)	15(88.2%)	
Socioeconomic status				
Very Low		22(30.1%)	1(5.9%)	0.002*
Low		17(23.3%)	2(11.8%)	
Medium		22(30.1%)	4(23.5%)	
High		12(16.4%)	10(58.8%)	
Number of children		1.1±0.819	1.06±0.748	0.865
Duration of fibromyalgia (months)		12.68±5.87	8.53±4.88	0.008
FIQ		63.68±14.02	41.12±14.25	<0.001*
Symptom severity scale		8.67±2.19	6.44±2.08	<0.001*
TPC		13.84±1.68	12.06±1.09	0.001*
Anxiety, *n* (%)		71(97.3%)	10(58.8%)	<0.001*

*: Statistically significant.

Table 5: Correlation between SS score and other parameters among fibromyalgia patients:

Variables	SS score	
	r	*P*
Age	0.307	0.022
BMI	0.236	0.102
Duration	0.527	<0.001*
Depression score	0.471	<0.001*
Anxiety score	0.563	<0.001*
FIQ	0.483	<0.001*
TPC	0.363	0.001*

*: Statistically significant; *r*: correlation coefficient.

DISCUSSION

There is a rising set of knowledge that FMS and mental disorders are linked. Depression, panic disorders, anxiety, and post-traumatic stress disorders (PTSD) are among them. The nature of the link is unknown, and it has been proposed that persistent pain leads to depression, anxiety or vice versa, and that chronic pain disorders are depression variations (Buskila and Cohen, 2007). As a result, it's possible that fibromyalgia and chronic pain sufferers have comparable psychological issues (Galvez-Sánchez *et al.,* 2019).

Although various research has looked at that link, evidence on the effects of anxiety and depression on FMS patients' subjective pain and tenderness is still few and ambiguous. The study's goal was to assess depression and anxiety in FMS patients, as well as their relationship to illness severity.

In the present study, we found that the median age of studied cases was 44.37±7.12 years old, and there was a substantial variation between the groups according sex, body mass index (BMI), and socioeconomic status which were higher among fibromyalgia cases.

Come in comparison with our findings, the investigation of Correa-Rodríguez *et al.,* (Correa-Rodríguez *et al.,* 2019), which showed that the average age of the participants in the research was 56.96±9.23 years. According to the BMI scale, 39.0 percent and 29.5 percent of the women in the research were overweight and obese, respectively. It's worth noting that the average BMI (28.6±5.36 kg/m^2) was inside the overweight category. In

terms of height, weight, and BMI, there were no substantial variations between FMS patients and healthy women.

Another study of Işık-Ulusoy, (Işık-Ulusoy, 2019), 38 FMS patients (30 female [78.9%]; median age 40.4±10 years) and 30 healthy controls (25 female/5 male; average age 39.9±10 years) were considered in the investigation. There were no statistically substantial variations in age, sex, or education level between the FMS and control groups.

In the current investigation, there was a substantial variation between the groups regarding HADS anxiety and depression which were greater in case group.

In harmony with our study, the study of Işık-Ulusoy, (Işık-Ulusoy, 2019), which reported that FMS patients had considerably greater levels of depressive, anxious, and cyclothymic temperaments than healthy controls. FMS patients showed greater depression (47.4 percent *n*= 18) and anxiety (42.1% *n*= 16) HADS cut-off scores than controls (16.6 percent *n*= 5, 10.0 percent *n*= 3) (p= 0.036, p= 0.027, respectively).

The most frequent mental illnesses among FMS patients are depression and anxiety disorders, with depression affecting 20 to 80 percent of patients and anxiety affecting 13 to 63 percent (Correa-Rodríguez *et al.,* 2019), Our findings of greater HADS anxiety and depression scores are in line with previous studies. Low blood serotonin concentrations, low cerebrospinal fluid concentrations of serotonin metabolites, norepinephrine, and dopamine, and high plasma cortisol concentrations were shown to be pathophysiological indicators of abnormal pain processing in FMS patients, and were equivalent to those seen in mental illnesses (Yunus, 2015).

Table 6: Multivariate regression analysis of factors associated with anxiety among fibromyalgia patients:

Variables	OR	S.E.	Sig.	95% CI
Age	1.255	0.093	0.750	0.090-2.575
BMI	0.070	0.075	0.355	0.009-0.219
Sex	1.784	0.941	0.062	0.089-3.657
TPC	0.122	0.250	0.628	0.076-0.620
Symptom severity score	0.293	0.100	0.004*	0.095-0.492
FIQ	0.166	0.027	0.000*	0.113-0.220
Duration	0.044	0.044	0.325	0.004-0.131
Unmarried	0.828	0.266	0.003	0.298-1.359
Children	0.141	0.267	0.600	0.092-0.673
Unemployment	0.784	0.561	0.166	0.333-1.900
Lower education	0.595	0.510	0.246	0.419-1.610

*: Statistically significant; CI: confidence interval; OR: odds ratio; S.E: standard error.

Table 7: Multivariate regression analysis of factors associated with depression among fibromyalgia patients:

variables	OR	S.E.	Sig.	95%CI
Age	0.124	0.047	0.009*	0.031-0.217
BMI	0.131	0.080	0.105	0.028-0.289
Sex	0.783	1.034	0.451	0.481-1.275
TPC	0.700	0.258	0.008	0.186-1.214
Symptom severity score	0.341	0.116	0.004*	0.111-0.572
FIQ	0.460	0.035	0.019	0.102-1.129
Duration	0.087	0.047	0.065	0.006-0.180
Unmarried	0.824	0.290	0.006	0.247-1.401
Children	0.105	0.289	0.718	0.047-0.679
Unemployment	0.047	0.612	0.938	0.017-1.266
Lower education	1.016	0.542	0.065	0.064-2.095

*: Statistically significant; CI: confidence interval; OR: odds ratio; S.E: standard error.

Furthermore, Alok *et al.,* (Alok *et al.,* 2011), found that Depression was found in 5% of non-FMS patients and was shown to be substantially linked with all three components of the FIQ (p <0.01), namely pain, symptoms, and impaired functioning. Patients with FMS, on the other hand, were more affected by all three FIQ components than those without FMS. The degree of depression, anxiety, and stress in FMS patients was shown to be substantially linked with the severity of all three FIQ components, namely pain, functioning, and symptoms (p <0.01).

Weir *et al.,* (Weir *et al.,* 2006), reported that Depression, anxiety, headaches, irritable bowel disorder, persistent fatigue disorder, systemic lupus erythematosus, and rheumatoid arthritis were all shown to be 2 to 7 times more common in people with fibromyalgia.

Fibromyalgia is a condition marked by persistent, extensive musculoskeletal pain and a low pain threshold at certain anatomical sites. Other symptoms of the condition include weariness, sleep disturbances, morning stiffness, and worry. It has a detrimental influence on patients' quality of life due to its chronic nature (Lee *et al.,* 2017).

In the study on our hands, we found that there was a substantial variation between patients with anxiety and patients without, also patients with depression and patients without where depression and anxiety are more among older age, higher BMI, lower education, longer disease duration and other psychological scores used.

Arnold *et al.,* (Arnold *et al.,* 2016), reported that in terms of illness duration, marital status, cigarette smoking, past eating disorders or alcohol addiction, current drug categories, and total number of medicines taken per patient, there were no substantial variations between groups. Higher education was linked to more usage of complementary and alternative medicine (P <0.001), as well as chiropractic, massage, and osteopathic therapies (P= 0.021). A reduced degree of education was substantially correlated with older age (P= 0.039), recent drug misuse (P= 0.016), current unemployment (P <0.001) and greater score in the following indicators of symptom intensity: Patient Global Assessment (PGA) (P= 0.019), FIQ (P= 0.002), Health Assessment Questionnaire (HAQ) (P= 0.001), McGill Pain Questionnaire (MPQ) (P= 0.026), Pain Disability Index (PDI) (P= 0.031), and Pain Catastrophizing Scale (PCS) (P= 0.015). Even after controlling age and gender variations, these relationships remained substantial. There were no substantial variations in pain intensity, anxiety, or depression across the groups.

Interestingly, there was a significantly positive link between symptom severity score and age, illness duration, depression score, anxiety score, FIQ, and TPC in the current research.

In agreement with our findings, the study of Koçyiğit and Okyay (Koçyiğit and Okyay, 2018), reported that BMI and VAS (visual analogue scale), TPC, FIQ, and Hamilton Depression Rating Score (HDRS) and Anxiety scores in FMS patients had substantial and favorable relationships (r= 0.277, p= 0.002; r= 0.384, p= 0.001; r= 0.292, p= 0.001; r= 0.357, p <0.001, respectively). BMI and HDRS and Anxiety (r= 0.164, p= 0.068) showed no substantial connection.

In addition to above findings, we demonstrated that a higher SS score, FIQ, and unmarried patients were substantially linked to a greater incidence of anxiety among fibromyalgia patients, furthermore, older age, higher TPC, higher SS score, FIQ, and unmarried patients were substantially linked to a greater incidence of depression among fibromyalgia patients.

As a result of our research, Galvez-Sánchez *et al.,* (Galvez-Sánchez *et al.,* 2019), reported that FIQ and TPC had extremely substantial (P <0.001) positive correlations, and VAS was considerably positively linked with FIQ and TPC (P <0.05 for each connection); there was no relationship between pain score and illness duration or patient age in this research. Their results show that the number of sensitive points connected to the Health Anxiety Inventory (HAI), Beck Depression Inventory (BDI), and FIQ are in contrast to previous research that found a link between the TPC and pain, but not depression or anxiety.

Patients with fibromyalgia have also been reported to have a diminished capacity to work typical hours. Fibromyalgia patients were observed to miss more days of work than their non-fibromyalgia counterparts (Palstam and Mannerkorpi, 2017).

Ramiro *et al.,* (Ramiro Fde *et al.,* 2014), showed that about half of all patients who had been able to work for the previous 12 months missed at least 10 days of work.

Rakovski *et al.,* (Rakovski *et al.,* 2012), found that almost one-third of patients shortened their work hours to meet their symptoms. The most prevalent cause for sick leave among 635 long-term sick-leavers assessed in a National Insurance study was fibromyalgia.

In our study, there were no significant correlations between unemployment and neither severity of fibromyalgia nor incidence of anxiety or depression.

Future research will either validate or refute the current results. Given the current findings, it would be interesting to see whether anxiety and depression-focused psychological therapies might lessen fibromyalgia pain and intensity. In order to relieve clinical symptoms and lessen the burden of FMS on health-related life quality, psychological therapy may be a useful supplement to pharmaceutical treatments.

CONCLUSION

Symptoms of anxiety and depression were common among fibromyalgia patients. Anxiety, on the other hand, was a more common secondary symptom, and it came in more severe forms. As a result, comorbidity should be respected and explored more thoroughly. The link between trait and state anxiety suggests that the anxiety state should be investigated since it may contribute to the development of an anxious profile. An interprofessional strategy to anxious and depression symptoms is extremely essential for the evaluation and treatment of fibromyalgia patients, due to the impact these psychological disorders can have on the presentation of the disease, whether through the intensification of pre-existing symptoms or the development of new ones. FMS sufferers are more prone than healthy controls to suffer from depression and anxiety disorders. Predicting clinical mental problems becomes increasingly crucial in light of these greater incidences.

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CONFLICTS OF INTEREST

No conflict of interest.

List of Abbreviations: American College of Rheumatology, ACR; Beck Depression Inventory, BDI; Body mass index, BMI; Diagnostic and Statistical Manual Of Mental Disorders, 5th Edition, DSM-5; Fibromyalgia impact questionnaire, FIQ; Fibromyalgia syndrome, FMS; Hamilton Depression Rating Score: HDRS; Health Anxiety Inventory, HAI; Health Assessment Questionnaire, HAQ; Hospital Anxiety and Depression Scale, HADS; Hypothalamic-pituitary-adrenal axis, HPA; McGill Pain Questionnaire, MPQ; Pain Catastrophizing Scale, PCS; Pain Disability Index, PDI; Patient Global Assessment: PGA; Post-traumatic stress disorders, PTSD; Standard deviation, SD; Symptom Severity scale, SS scale; Tender point count, TPC; Visual analogue scale, VAS.

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