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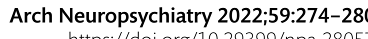

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RESEARCH ARTICLE

Functional Somatic Symptoms and Their Predictors in Patients with Major Depressive Disorder and Fibromyalgia Syndrome

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ABSTRACT

Introduction: Despite being different medical conditions, functional somatic symptoms (FSSs) are common in patients with major depressive disorder (MDD) and fibromyalgia syndrome (FMS). Higher levels of depression, anxiety, somatosensory amplification, hypochondriacal worry and alexithymia may be related to the severity of somatization in patients with MDD and FMS. We aimed to investigate the typology and severity of FSSs and the association between FSSs and these psychiatric symptoms in patients with MDD and FMS.

Method: 56 MDD, 33 FMS, 21 CoMF (Comorbidity of MDD and FMS) patients, and 50 healthy participants were included in the study, respectively. Diagnosis of MDD and FMS was established according to DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders, Revised Text), and ACR (American College of Rheumatology) 2010 diagnostic criteria. All participants were evaluated with self-report questionnaires including Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Somatosensory Amplification Scale (SSAS), Toronto Alexithymia Scale-20 (TAS-20), Whiteley Index-7 (WI-7), The Symptom Checklist-90-R (SCL-90-R) somatization subscale and Bradford Somatic Inventory-44 (BSI-44).

Results: The severity of somatization was statistically significantly highest in the CoMF group, and similar in the FMS and MDD groups, and lowest in the control group according to the BSI-44 and SCL-90-R results. The typology of FSSs was quite similar in patients with MDD and FMS, and weakness, tiredness and neck pain were the most common FSSs in both groups. Independent predictors of FSSs were age, the severity of anxiety and alexithymia in the MDD group, however, it was only the severity of anxiety in the FMS group.

Conclusions: Our results show that the typology and severity of FSSs are similar in MDD and FMS patients. Moreover, somatization appears to be more associated with anxiety in patients with MDD and FMS.

Keywords: Alexithymia, anxiety, depression, fibromyalgia, hypochondriasis, somatization

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INTRODUCTION

Major depressive disorder (MDD) is an important public health problem and categorized under the depressive disorders section and it is considered as a primary affective disorder. MDD is diagnosed with psychological, cognitive symptoms (depressed mood, guilt or feelings of worthlessness, anhedonia, memory difficulties, etc.) and functional somatic symptoms (FSSs) (fatigue, appetite change, hypersomnia/insomnia, sexual problems, etc.). According to (Diagnostic and Statistical Manual of Mental Disorders, Revised Text) (DSM-IV-TR) either sad mood or anhedonia should be needed for the MDD diagnosis, thus it privileges psychological symptoms of depression over somatic symptoms (1). Some authors have suggested that the expression of depression is more somatic than psychologic around the world (2). Thus, the current DSM approach may lead to underdiagnosing of MDD for these patients. Fibromyalgia syndrome (FMS) is a functional somatic syndrome characterized by generalized muscle pain, fatigue and paresthesia (3). FMS is diagnosed according to patient's history and physical examination (3). Although previous diagnostic criteria were based on the number of trigger points for FMS, modified criteria require lesser trigger points and more disabling symptoms including fatigue, headache and sleep disturbance (4).

FMS has been associated with different psychiatric conditions up to now. Some clinicians discussed whether FMS is a somatoform pain disorder because of prevalent FSSs including pain or cramps in the lower abdomen, headache, and widespread pain (5). Others linked FMS with MDD in terms of similar medical treatment response, contributing factors to susceptibility, bidirectional relationship between FMS and depression and similar symptoms, etc. (6,7). Thus, it has been suggested that these disorders share common pathophysiology (6,7).

FSSs are also observed in anxiety disorders commonly associated with depressive symptoms (8). Moreover, the relationship between anxiety and somatic symptoms has been determined stronger even than depression (9). Thus, one important aspect of FSSs is anxiety symptoms and disorders.

FSSs include bodily pain, weakness, fatigue, muscle tension, gastrointestinal upset, heart palpitations, paresthesias (10). These symptoms have been assessed in the context of 'medically unexplained' or 'disproportionate' to the underlying illness. There is not any laboratory finding for FSSs. Learning, traumatic life events, genetic factors and cultural/social norms may contribute to FSSs (11).

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Highlights

- **The severity of somatization was similar in fibromyalgia syndrome (FMS) and major depressive disorder (MDD) patients.**
- **Scores of anxiety and depression were higher in MDD than in FMS patients.**
- **The severity of somatization was highest in CoMF (Comorbidity of MDD and FMS) patients.**
- **The severity of anxiety predicts somatization in FMS and MDD patients.**

Somatosensory amplification, hypochondriasis and alexithymia have been related to FSSs. Somatosensory amplification is defined as a tendency to perceive somatic sensations intensely, dangerously and disturbingly (12). Hypochondriasis is defined as the attribution of somatic complaints to a serious disease despite the assurance of physicians (1). Alexithymia means difficulty in identifying and expressing feelings (1). Somatosensory amplification, hypochondriasis and alexithymia have been studied in different groups of patients with FSSs (13,14).

Although several studies have been conducted on FSSs in FMS and MDD patients (15,16), we could not find any study which evaluates and compares detailed somatization, anxiety, depression, somatosensory amplification, hypochondriacal worry and alexithymia in FMS, MDD and comorbidity of FMS and MDD (CoMF) patients. Accordingly, the hypotheses we test in this study are; 1) Severity of FSSs and related symptoms are the highest in CoMF and similar in MDD and FMS patients. 2) MDD patients are more depressive and anxious than FMS patients. 3) Extra musculoskeletal symptoms and depressive symptoms are common in FMS patients, and pain is a common symptom in MDD patients. 4) Anxiety and depression predict somatization in the FMS and MDD groups.

METHODS

Setting and Sample

The present study was carried out between January 2016 and January 2017. The patients with MDD, FMS, and CoMF were included in our study from psychiatry and physical therapy and rehabilitation outpatient clinics. MDD and FMS were diagnosed according to DSM-IV-TR diagnostic criteria and American College of Rheumatology ACR 2010 diagnostic criteria, respectively (1,3). We included 56 MDD, 33 FMS, 21 CoMF patients and our control group consisted of 50 sex and age similar participants. The exclusion criteria were: a) having physical handicap (i.e. being deaf), b) presence of psychiatric disorders other than MDD, c) presence of medical conditions other than FMS, c) illiteracy, d) age below 18 and above 65 years, e) use of any psychotropic and other drugs (i.e. pregabalin, non-steroids anti-inflammatory drugs, etc.) within the last 30 days, and f) refusal of study participation. The inclusion criteria were: a) having major depressive disorder and/or fibromyalgia, b) willingness to participate in the study, and c) giving informed consent. The study was approved by the Marmara University Hospital Local Ethics Committee in January 2016 (08.01.2016/09.2016.073), and all patients were given an informed consent form.

Procedure

Structured Clinical Interview (SCID-I) for DSM-IV Axis I Disorders was used to evaluating MDD and other comorbid psychiatric disorders in MDD, FMS, and CoMF groups. All the patient groups were assessed based on the 2010 ACR diagnostic criteria for the determination of FMS comorbidity. Patients having any medical and psychiatric comorbidities other than MDD and FMS were excluded from our study. Control group participants were included in the study from hospital staff and the relatives of the patient. After a medical and psychiatric evaluation, self-report scales were given to all the study participants.

Measures

A brief socio-demographic form was created by the authors of this study. It included the marital status, age, education level, occupational status, house ownership and household income of the participants.

SCID-I is a structured clinical interview scale developed for the diagnosis of major DSM-IV Axis I disorders. The validity and reliability study of SCID-I has been performed for the Turkish language (17).

The depression and anxiety levels were assessed by Beck Depression Inventory (BDI) (18) and Beck Anxiety Inventory (BAI) (19). These inventories have been demonstrated to be valid and reliable for Turkish population (20,21).

The level of somatic symptomatology and typology was assessed using somatization subscale of Symptom Checklist – 90 – Revised (SCL-90-R) and Bradford Somatic Inventory-44 (BSI-44). The SCL-90-R somatization subscale is a multidimensional self-report measure of psychopathology with well-established reliability and validity (22). It is a 12-item list of common somatic symptoms and has been demonstrated to be reliable for the Turkish population, with Cronbach's α=0.75 (23).

Bradford Somatic Inventory BSI-44 is a 44-item inventory for assessment of somatic expression of psychological distress (24). The BSI-44 evaluates a wide range of FSSs during the previous month. According to BSI-44, results of the severity of somatization has been classified as; high (above 40 points), middle (between 26 and 40 points), low (between 0 and 25 points). The validity and reliability study has been performed in Turkish language and the value of Cronbach was α=0.90 (25).

The Somatosensory Amplification Scale (SSAS) is a 10-item scale developed by Barsky et al. (12) and its validity and reliability have been demonstrated. Respondents score each item from 1 (Not at all true) to 5 (Extremely true). SSAS evaluates the sensitivity of both normal bodily sensations and neutral/noxious stimuli. It was adapted to Turkish by Güleç et al., and the Turkish version of the SSAS had good internal reliability with a Cronbach's α of 0.80 (26).

Hypochondriacal worry was assessed using a modified version of the Whiteley Index (WI). The WI is a widely used instrument developed by Pilowsky and it evaluates hypochondriac worries and beliefs (27). Factor analysis of the WI yields three separate factors: disease fear, disease conviction, and bodily preoccupation. The Seven-item version of the WI (WI-7) was validated in the Turkish language (28).

Alexithymia was measured using Toronto Alexithymia Scale (TAS) developed by Bagby et al. (29). The TAS is a five-point Likert-type self-report scale. While the early form of the scale consisted of 26 items, it has been revised and converted into a more reliable form containing 20 questions (30). The TAS-20 consists of three subscales measuring difficulty in identifying feelings and distinguishing them from bodily sensations of emotion, difficulty expressing feelings, and externally oriented thinking. It has been demonstrated to be reliable in the Turkish population (31).

Data Analysis

The data were analyzed using IBM SPSS V21.0 (the Statistical Program

for Social Sciences for Windows Inc. an IBM Co., Somers, NY). For the assessment of the normality of distribution Shapiro Wilk test was used. Chi-square/Fisher's Exact Test was used to compare the study groups for categorical data. For continuous data, one-way ANOVA or Kruskal-Wallis tests were used. Post hoc Tukey or Bonferroni-corrected Mann-Whitney U tests were used to identify the group that caused the difference. Pearson correlation analysis was employed for the evaluation of relationships between parameters. Multivariate Logistic regression analysis was used to reveal the factors determining the somatization score. For the statistical significance level, p=0.05 was used.

RESULTS

During the initial assessment, 192 participants were consecutively included in the study. Out of these, 32 were excluded. The participants' exclusion criteria were taking antidepressant medication in 10 patients, hypertension in three patients, diabetes mellitus in two patients, rheumatoid arthritis in two patients, bipolar disorder and schizophrenia in six patients, refusal to attend the study in six patients, being illiterate in two patients, mental retardation in one patient. After the exclusion, 160 participants were enrolled in the study in four groups; 56 patients with MDD, 33 patients with FMS, 21 patients with CoMF, and 50 healthy participants. The age of the participants ranged from 18 to 60 years and 140 of the participants (87.5%) were female. There was not any statistically significant difference among either of the groups in terms of age, gender, education level and marital status (p_{all}>0.05). Higher unemployment (χ^2 (4.160)=8.45, p=0.001) and lower-income (χ^2 (4.160)=25.124, p=0.003) were determined in the patient group compared to the control group. The sociodemographic features and baseline characteristics have been demonstrated in Table 1.

Table 2 presents means and standard deviations (SD) for somatization, depression, anxiety, hypochondriacal worry, somatosensory amplification and alexithymia in the study groups. Bonferroni correction was used for multiple comparisons. The significance level was adjusted to 0.0071. All variables were significantly different among the groups (p_{all}<0.0071).

Post-hoc tests revealed that the severity of somatization was similar in FMS and MDD groups. The severity of somatization was highest in the CoMF group and lowest in the control group. Scores of BSI-44, SCL-90-R somatization subscale, BDI, BAI, WI-7, SSAS and TAS-20 were significantly higher in the patient groups than the control group, however, only the TAS-20 score was not significantly different between FMS and control group. In addition, BDI and TAS-20 scores were similar in the MDD and CoMF groups, and SSAS scores were similar in the patient groups (Table 2).

The most commonly reported FSSs were feeling tired while not working (92.9%) and aches and pain all over the body (93.9%) in the MDD and

Table 1. Sociodemographic and baseline characteristics of sample (n=160)

	MDD (n=56)	CoMF (n=21)	FMS (n=33)	Control (n=50)	F/X²	p
Age (mean, SD)	35.48 (8.67)	36.76 (10.11)	40.18 (6.74)	38.38 (7.90)	2.505	0.061*
Sex (% female)	82.1	90.5	90.9	90	2.276	0.517**
Education level (mean number of years, SD)	8.50 (3.42)	8.28 (3.87)	7.60 (4.03)	8.14 (3.63)	3.081	0.379***
Marital status (% married)	75.0	76.2	90.9	90.0	9.8173	0.365**
Occupational status (% employed)	30.4	19.0	12.1	72.0	8.45	0.001**
House ownership (% owned)	55.4	61.9	72.7	70.0	3.735	0.292**
Household income (% minimum wage and below)	21.4	19.0	12.1	2.0	25.124	0.003**

* One Way ANOVA, ** Chi-Square test, *** Kruskal-Wallis test.
CoMF: Comorbidity of MDD and FMS; FMS: Fibromyalgia Syndrome; MDD: Major Depressive Disorder; p: p-value; SD: Standard Deviation.

Table 2. Comparison of BSI-44, SCL-90-R somatization subscale, BDI, BAI, WI-7, SSAS and TAS-20 scores of the study groups and the results of post-hoc analysis

	MDD[1] (n=56)	CoMF[2] (n=21)	FMS[3] (n=33)	Control[4] (n=50)		
	Mean ± SD	Mean+SD	Mean+SD	Mean+SD	F/X²	p
BSI-44	34.60±14.49	53.23±14.68	34.45±14.32	9.66±7.86	95.117	<0.001*
Scl-90R soma	19.46±8.76	28±5.18	19.63±7.67	6.28±4.69	89.50	<0.001*
BDI	29.35±8.68	26.28±6.65	8.72±3.08	4.28±2.87	127.32	<0.001*
BAI	24.33±12.67	29.57±10.60	15.18±8.28	5.56±5.37	86.84	<0.001*
WI-7	2.98±2.01	3.90±1.99	3.12±1.94	0.94±1.34	48.211	<0.001*
SSAS	28.83±8.52	32.52±7.44	27.63±7.63	22.34±7.57	10.255	<0.001**
TAS-20	59.26±10.38	57.28±11.92	48.21±11.07	42.42±8.33	27.628	<0.001**
Post-hoc	*p1–2*	*p1–3*	*p1–4*	*p2–3*	*p2–4*	*p3–4*
BSI[a]	<0.001	>0.05	<0.001	<0.001	<0.001	<0.001
Scl-90R Soma[a]	<0.001	>0.05	<0.001	<0.001	<0.001	<0.001
BDI[a]	>0.05	<0.001	<0.001	<0.001	<0.001	<0.001
BAI[a]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
WI-7[a]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SSAS[b]	>0.05	>0.05	<0.01	>0.05	<0.01	0.017
TAS-20[b]	>0.05	<0.01	<0.01	<0.01	<0.01	>0.05

* Kruskal-Wallis test, ** One-Way ANOVA test.
a: Mann-Whitney U Test with Bonferroni-corrected, b: Tukey's Test.
BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; BSI: Bradford Somatic Inventory; CoMF: Comorbidity of MDD and FMS; FMS: Fibromyalgia Syndrome; MDD: Major Depressive Disorder; p: p-value; Scl-90R Soma: The Symptom Checklist-90-R Somatization Subscale; SD: Standard Deviation; SSAS: Somatosensory Amplification Scale; TAS-20: Toronto Alexithymia Scale-20; WI-7: Whiteley Index-7.

Table 3. Frequency of various functional somatic symptoms as per BSI-44 in the all groups (total seen "present for<15 days" and "present for >15 days" in last month)

	MDD	CoMF	FMS	Control
	n=56	n=21	n=33	n=50
	%	%	%	%
1 Severe headache?	71.4	90.5	66.7	42.0
2 Fluttering or a feeling of something moving in your stomach?	41.1	66.7	36.4	4.0
3 Pain or tension in your neck and shoulders?	83.9	100.0	90.9	50.0
4 Has your skin been burning or itching all over?	41.1	61.9	57.6	18.0
5 Feeling of constriction of your head?	41.1	61.9	33.3	4.0
6 Felt pain in the chest or heart?	50	90.5	61.6	16.0
7 Has your mouth or throat felt dry?	71.4	95.2	57.6	30.0
8 Has there been darkness or mist in front of your eyes?	77.9	81.0	42.4	16.0
9 Felt a burning sensation in your stomach?	67.9	81.0	54.5	30.0
10 Felt weakness much of the time?	87.5	100.0	90.9	48.0
11 Has your head felt hot or burning?	37.5	52.4	39.4	4.0
12 Sweating a lot?	69.6	81.0	62.7	18.0
13 Felt as if there was pressure or tightness on your chest or heart?	51.8	76.2	51.5	12.0
14 Have you been suffering ache or discomfort in the abdomen?	51.8	76.2	49.5	10.0
15 Has there been a choking sensation in your throat?	39.3	27.6	24.2	4.0
16 Hands and feet had pins and needles or gone numb?	60.7	95.2	63.6	26.0
17 Felt aches and pains all over the body?	42.9	100.0	93.9	6.0
18 Had a feeling of heat inside your body?	50.0	81.0	72.7	12.0
19 Aware of palpitations (heart pounding)?	51.8	47.6	45.5	16.0
20 Felt pain or burning in your eyes?	69.6	90.5	48.5	32.0
21 Suffered from indigestion?	46.4	85.7	51.5	24.0
22 Trembling or shaking?	50.0	66.6	24.2	6.0
23 Passing urine more frequently?	55.4	85.7	45.5	16.0
24 Having low back trouble?	55.4	95.2	81.8	36.0
25 Stomach felt swollen or bloated?	55.4	76.2	57.6	22.0
26 Head felt heavy?	73.2	85.7	75.8	22.0
27 Feeling tired, even when you are not working?	92.9	100.0	87.9	36.0
28 Getting pain in your legs?	80.4	95.2	90.9	50.0
29 Feeling sick in the stomach (nausea)?	67.9	95.2	54.5	30.0
30 Feeling of pressure inside your head, as if your head was going to burst?	60.7	76.2	30.3	8.0
31 Difficulty in breathing, even when resting?	35.7	69.7	36.4	2.0
32 Felt tingling (pins and needles) all over the body?	35.7	71.4	30.3	4.0
33 Troubled by constipation?	46.4	66.7	42.4	30.0
34 Wanted to open your bowels more often than usual?	42.9	66.7	42.4	24.0
35 Palms sweating a lot?	39.3	66.7	42.4	10.0
36 Had difficulty in swallowing?	66.1	76.2	24.2	16.0
37 Feeling giddy or dizzy?	73.2	76.2	57.6	26.0
38 Bitter taste in your mouth?	55.4	85.7	36.4	24.0
39 Whole body felt heavy?	75.0	100.0	78.8	18.0
40 Burning sensation when passing urine?	48.2	57.1	39.4	16.0
41 Hearing a buzzing noise in your ears or head?	50.0	81.0	30.3	18.0
42 Heart felt weak or sinking?	42.9	42.9	18.2	8.0
43 Suffered from excessive wind or belching?	50.0	76.2	57.6	26.0
44 Hands or feet felt cold?	50.0	71.4	39.4	10.0

BSI: Bradford somatic inventory; CoMF: comorbidity of MDD and FMS; FMS: fibromyalgia syndrome; MDD: major depressive disorder.

FMS groups, respectively. In the CoMF group, FSSs were higher than MDD and FMS groups. Extra musculoskeletal system findings were also (i.e., severe headache, suffering from indigestion, passing urine more frequently) more commonly observed in the CoMF group than FMS and MDD. BSI-44 results have been demonstrated in Table 3.

Most of our variables were statistically significantly correlated with each other in this study. Strong correlation has been determined between BSI-44 and BAI in patients with MDD and FMS ($r=0.757$, $p<0.01$; $r=0.772$, $p<0.01$ respectively). Moderate correlations have been demonstrated between BSI-44 and WI-7, SSAS, and TAS-20 total in MDD and FMS patients. However BSI and BDI significantly correlated only in MDD patients, but not in FMS patients ($r=0.460$, $p<0.01$; $r=0.242$, $p>0.05$ respectively) (Table 4 and 5).

Factors predicting somatization in the MDD and FMS groups were evaluated by multivariate logistic regression analysis. We excluded the CoMF group for the logistic regression analysis due to the small number of patients, and we performed the logistic regression model only for the MDD and FMS groups. The mean somatization score was determined to be 35 points and, thus we evaluated above this score as cut off point for the presence of somatization.

Table 4. Correlations between BSI-44, age and other scales in the MDD group

	BSI-44	Age	SCL-90R soma	WI-7	SSAS	BDI	BAI	Factor 1 (TAS-20)	Factor 2 (TAS-20)	Factor 3 (TAS-20)	TAS-20 total
BSI-44		-0.136	0.737**	0.416**	0.508**	0.460**	0.757**	0.458**	0.139	0.225	0.412**
Age			-0.129	0.014	-0.100	0.097	-0.143	-0.242	-0.061	-0.014	-0.161
SCL-90R Soma				0.329*	0.391**	0.489**	0.783**	0.462**	0.116	0.129	0.361**
WI-7					0.579**	0.210	0.403*	0.214	0.098	0.095	0.206
SSAS						0.385**	0.447**	0.243	-0.015	-0.034	0.133
BDI							0.444**	0.341*	0.219	0.161	0.368**
BAI								0.453**	0.085	0.125	0.339*
Factor 1 (TAS-20)									0.479**	0.073	0.768**
Factor 2 (TAS-20)										0.461**	0.838**
Factor 3 (TAS-20)											0.608**
TAS-20 total											

Pearson correlation.
* p<0.05, ** p<0.01.
BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; BSI: Bradford Somatic Inventory; MDD: Major Depressive Disorder; SSAS: Somatosensory Amplification Scale; SCL-90R Soma: The Symptom Checklist-90-R Somatization Subscale; TAS-20: Toronto Alexithymia Scale-20; WI-7: Whiteley Index-7.

Table 5. Correlations between BSI-44, age and other scales in the FMS group

	BSI-44	Age	SCL-90R Soma	WI-7	SSAS	BDI	BAI	Factor 1 (TAS-20)	Factor 2 (TAS-20)	Factor 3 (TAS-20)	TAS-20 total
BSI-44		0.175	0.783**	0.407*	0.502**	0.242	0.772**	0.490**	0.082	-0.062	0.417*
Age			0.212	0.027	0.097	-0.157	0.091	0.029	-0.161	-0.352*	-0.104
SCL-90R Soma				0.367*	0.442*	0.108	0.741**	0.323	0.078	-0.072	0.235
WI-7					0.427*	0.375*	0.394*	0.707**	0.075	0.280	0.625**
SSAS						0.143	0.487**	0.550**	0.271	0.217	0.534**
BDI							0.225	0.419*	0.323	0.085	0.330
BAI								0.454**	0.059	0.069	0.365*
Factor 1 (TAS-20)									0.244	0.332	0.880**
Factor 2 (TAS-20)										0.084	0.604**
Factor 3 (TAS-20)											0.620**
TAS-20 total											

Pearson correlation.
* p<0.05, ** p<0.01.
BAI: Beck anxiety inventory; BDI: Beck depression inventory; BSI: Bradford somatic inventory; FMS: fibromyalgia syndrome; SCL-90R soma: the symptom checklist-90-R somatization subscale; SSAS: Somatosensory amplification scale; TAS-20: Toronto alexithymia scale-20; WI-7: Whiteley index-7.

The general variables of age, gender and mean points of somatization-related scales of BDI, BAI, SSAS, TAS-20 were included in the model. Multicollinearity was determined. In the last step, it was found that age (1.166, P: 0.024, Odds Ratio [OR] [95% Confidence Interval-CI], [1.021–1.333]), higher BAI total score (1.204, P: 0.002, OR [95% CI], [1.071–1.354]), and TAS-20 (1.137, P: 0.039, OR [95% CI], [1.006–1.285]) were independent predictors of somatization in the MDD group. According to a similar analysis only an increased level of BAI was found to be the predictor of somatization in the FMS group (1.345, P: 0.003, OR [95% CI], [1.103–1.641]).

DISCUSSION

This study demonstrated the frequency and typology of FSSs and the association between psychological symptoms and FSSs in patients with MDD, FMS, and CoMF. The severity of somatization was similar in the FMS and MDD groups, which was higher than the control group and lower than the CoMF group. Although only anxiety was the predictor of FSSs in FMS patients, several factors including age, severity of anxiety and alexithymia were predictors of FSSs in MDD patients. Fatigue-related somatic symptoms were the most common typology of FSSs in both MDD and FMS groups.

Mean FSSs score is higher in CoMF than MDD and FMS patients separately according to the BSI-44 and SCL-90R somatization test results (Table 2). This result confirms our first hypothesis. We could not find any comparison similar to our study. Thus, we may speculate that FMS and MDD reciprocally affect each other in terms of somatization. Although MDD is primary affective disorder, moderate somatic symptoms have been determined in our sample similar to FMS patients (Table 2). This result supports the idea which states the importance of somatic presentations in MDD patients (2).

FMS patients had mild depression and moderate anxiety symptoms. Although some authors described FMS as masked depression or affective spectrum disorder (15), our findings did not support this result especially in terms of depression and anxiety severity. Since BDI evaluates mostly cognitive and affective components of depression, the BDI score may be lesser in FMS patients than in MDD patients. These results affirm our second hypothesis but not the third hypothesis.

The most common FSSs were related to fatigue and pain both in the MDD group (27th, 10th, 3rd, 28th, and 8th items), and in the FMS group (17th, 10th, 3rd, 28th, and 27th items) (Table 3). This result confirmed our third hypothesis. MDD and FMS patients were similar in terms of FSSs typology and severity. Common pain symptoms have been demonstrated by BSI-44 results in MDD patients in different cultures (14,32). Pain may be an important somatic symptom for MDD patients and this may lead to the underdiagnosis of MDD patients presented with these somatic symptoms according to the DSM approach.

Extra musculoskeletal FSSs were also determined in the gastrointestinal system (7th, 9th, 21th, 25th, and 29th items), central nervous system (1st and 37th items), cardiovascular system (13th item), and dermatologic system (4th item) in the above half of the FMS patients. These results confirm our third hypothesis. Some authors have suggested whether FMS is a somatic symptom disorder (33). Although limited data have been demonstrated in this area; headache, sleep problems and gastrointestinal symptoms may be observed in FMS patients (34). Extra musculoskeletal FSSs may be an important issue in FMS patients.

Close relationship has been demonstrated between BSI-44 and anxiety in MDD and FMS patients. Anxiety may be observed with autonomic hyperactivity symptoms including nausea, muscle tension, diarrhea, chest pain, headache, etc., similar to somatic symptoms. Since BAI evaluates these autonomic hyperactivity symptoms, the severity of anxiety may be more associated with FSSs than the severity of depression in MDD and FMS patients. Somatosensory amplification, hypochondriacal worry and alexithymia were significantly correlated with somatization scores in MDD and FMS patients. Our correlation analysis results were consistent with previous studies (Table 4 and 5) (14,16,32).

In the present study age, higher BAI score, and TAS-20 predicted somatization in MDD patients. Although female gender, low socioeconomic level and low level of education were associated with somatic symptoms in previous studies, none of the sociodemographic characteristics were identified as predictive factors for somatic complaints (16,32). Due to the small sample size, we could not evaluate all of these sociodemographic features in the logistic regression analysis. Whether somatization is more common in older ages has not been clarified (35), thus, replication of our results may be an important issue in the future.

Although alexithymia was introduced as a concept associated with psychosomatic diseases, different results were obtained regarding its association with somatization. According to previous findings, whether alexithymia is a determinant of somatization is not clear in MDD patients (16). Our findings were similar to a study performed in our country (16), thus, transcultural factors may have caused this result.

Anxiety predicted somatization in both MDD and FMS patients. These results confirm previous findings (16). Since BAI and BSI-44 have similar items related to autonomic hyperactivity and somatic symptoms, this may cause to close association between anxiety and somatization in both FMS and MDD patients. Moreover, FMS patients have moderate anxiety and low depression. These two results might differ in anxiety and depression in terms of somatization prediction. Thus, our last hypothesis was partially confirmed.

The strengths of our study are as follows: i) Diagnoses of MDD was based on SCID-I, which was the gold standard method for psychiatric diagnosis, ii) FMS was diagnosed according to ACR 2010 diagnostic criteria, and iii) Validity and reliability studies have been performed in the Turkish language for all tests.

Our study has several limitations, which may be listed as; having a small sample size, especially of CoMF patients, cross-sectional design, lack of laboratory data for the exclusion of any confounding factors, and recall bias for psychiatric history.

To our best knowledge, this is the first study that comprehensively evaluates somatization and related factors in FMS, MDD, and CoMF patients in a Turkish clinical sample. Our results showed that despite the different diagnoses, severity of somatic symptoms and somatic symptom profiles were very similar in FMS and MDD patients. Extra-musculoskeletal symptoms were common in FMS patients. Anxiety might be a predictive factor for somatic symptoms in FMS and MDD patients. The severity of somatization was highest in the CoMF group. Somatization and related factors are quite important for MDD and FMS patients, thus, further longitudinal studies are needed for the clarification of this association.

Ethics Committee Approval: The study was approved by the Marmara University Hospital Local Ethics Committee in January 2016 (08.01.2016/09.2016.073).

Informed Consent: All patients were given an informed consent form.

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Author Contributions: Concept– NST, ÖY, FBD, KS; Design– NST, ÖY, FBD, KS; Supervision– NST, ÖY, FBD, KS; Resources– NST, ÖY, FBD, KS; Materials– NST, ÖY, FBD, KS; Data Collection and/or Processing– NST, ÖY, FBD, KS; Analysis and/or Interpretation– NST, ÖY, FBD, KS; Literature Search– NST, ÖY, FBD, KS; Writing Manuscript– NST, ÖY, FBD, KS; Critical Review– NST, ÖY, FBD, KS.

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