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Assessment of quality of life, anxiety, depression, and sleep quality in women with fibromyalgia and their spouses

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Abstract. – OBJECTIVE: Fibromyalgia syndrome (FMS) is a chronic disease that is more common in adult women and is characterized by widespread pain in the body, especially in the musculoskeletal system. Fatigue, sleep disturbance, anxiety disorder, and depression can be observed in this syndrome alongside pain. The aim of our study was to investigate the effect of FMS on the quality of life, psychological condition, and sleep quality of affected female patients and their spouses compared to women without FMS and their spouses.

PATIENTS AND METHODS: Thirty female patients diagnosed with fibromyalgia and their spouses and 38 healthy women and their spouses similar in age to these patients voluntarily participated in our study (136 participants total). The diagnosis of the patients was made according to the American College of Rheumatology. Turkish versions of the Short Form-36 (SF-36), the Hospital Anxiety and Depression Scale, and the Pittsburgh Sleep Quality Index (PSQI) questionnaires with validity and reliability were applied to all participants. The statistical analyses were carried out using SPSS 24.0 for Windows (SPSS Inc., Chicago, IL, US). Differences with *p*-values of ≤0.05 were statistically significant, and all results are expressed with a 95% confidence interval.

RESULTS: A total of 136 people, including women with FMS (n=30), spouses of FMS women (n=30), non-FMS control women (n=38), and spouses of the control women (n=38), were included in the study. The patient and control groups were similar in age and gender. However, participants in the study group had higher mean Body Mass Indexes compared to the controls. Quality of life and its sub-scales (except SF-36/Social function parameter), depression, anxiety status, and sleep quality were significantly different between the patients and controls. Additionally, quality of life and its sub-scales (except SF-36/Social function parameter), depression, and anxiety status were significantly different between the spouses of the patients and controls. There were no significant differences between the groups regarding the mean SF-36/SF (*p*=0.995 for both). Additionally, there was no significant difference between the spouse of the patient and control regarding the mean PSQI values (*p*=0126).

CONCLUSIONS: We believe that new and more comprehensive studies are necessary regarding the spouses of women with FMS in depression, anxiety, sleep quality disorders that we frequently see in women with FMS, and other psychosocial conditions that we have not mentioned here. In conclusion, women with FMS and their spouses.

Key Words:
Fibromyalgia syndrome, Spouses, Depression, Anxiety, Quality of life, Sleep quality.

Introduction

Fibromyalgia syndrome (FMS) is a chronic disease that is more common in adult women, and the etiology remains unknown. It is characterized by widespread pain in the body, especially in the musculoskeletal system. Fatigue, sleep disturbance, anxiety disorder, and depression can be seen in this syndrome alongside pain[1,2]. The prevalence of the disease varies between 1.8-4 % in women and 0.1-05 % in men in different studies conducted according to different diagnostic criteria. The prevalence of fibromyalgia (FM) in a meta-analysis of 65 studies revealed that the overall population was 4% in adult females and

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0.5 % in males. As can be seen, the prevalence of FM in women varies between 6-10 times more than men in some prevalence studies[1,3].

In 1990, the American College of Rheumatology (ACR) established two diagnostic criteria: first, the presence of generalized pain for at least three months, and second, detection of hypersensitivity in at least 11 of the 18 predefined points in the application of a digital force 4kg per surface unit. ACR updated the diagnosis of FMS in 2010[4,5]. However, the 1990 criteria are indispensable for most clinicians. That is why we based our study on the 1990 criteria. The prevalence of FMS is approximately 4% for the general population[6]. Approximately 8% of applications in primary health care are patients with FMS. Notably, approximately 20% of primary care applications are related to rheumatology[7,8].

FM is mostly seen in women between the ages of 20 and 55 years, the prevalence is approximately 3% and increases with age[9-12]. FM is more common in women than men. However, it occurs also in both children and adults besides women[9,12,13].

The diagnosis may be under-recognized in clinical practice. Prevalence estimates vary greatly with the specific diagnostic criteria applied. The prevalence of FM was much higher using surveys with standardized criteria than estimates based upon medical record documentation of the diagnosis (6.4% *vs.* 1.1%)[9]. Fayaz et al[14] on the United Kingdom population found a prevalence of chronic widespread pain (CWP) of 14% and FM of 5%. In a National Health Service electronic health records survey in the United Kingdom, there was an increase in the diagnosis of FM for the period 2001 to 2013 compared with 10 years earlier[15].

To provide adequate and quality treatment to FMS patients, it is crucial to keep in mind the patients' quality of life, functional capacity, details of their family life, and accompanying comorbid conditions[16-18].

Chronic fatigue is common in fibromyalgia. Neuroinflammation has also been shown, especially in fibromyalgia patients with severe pain[19]. Glial activation in several areas of the brain has also been demonstrated in positron emission tomography (PET) scans of patients with FM. Therefore, should not be ignored diagnosis of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) in the FM[20]. Chronic widespread and severe pain can be caused anger in patients with Fibromyalgia. In addition, association of Fibromyalgia and neurodegenerative disease can be observed especially in elderly patients as well[21].

FMS does not cause any abnormalities in routine clinical laboratory testing or imaging. However, abnormalities that reveal distinctions between patients with FM and control subjects have been identified in research studies using specialized neuroimaging (e.g., functional magnetic resonance imaging [MRI]) and other techniques. Research studies have also found that a subset of patients with FM has abnormalities on skin biopsies suggestive of small-fibre neuropathic changes. The significance of these findings is uncertain for FMS diagnosis, and small-fibre skin biopsy is not warranted for diagnosis of FMS in routine clinical practice[22,23].

FM should be suspected in patients with chronic pain of at least three months' duration without another identified cause. The diagnosis of FM is symptom-based[24]. FM can generally be diagnosed based upon symptoms of widespread pain in multiple sites. It is often accompanied by moderate to severe problems with sleep or fatigue of at least three months duration; other symptoms may also be present. Although widespread tenderness is present at multiple sites, there is an absence of joint swelling or other inflammatory changes on physical examination.

For clinicians who are inexperienced or uncomfortable with the diagnosis of FM, we consider it appropriate to utilize either the 2010 criteria or the ACTTION-APS Pain Taxonomy 2019 diagnostic criteria[25] to help guide the diagnosis, despite several limitations of their use for this purpose.

However, such diagnostic guidelines cannot replace clinical judgment, the diagnostic gold standard of symptom-based diagnosis[26]. Because of the importance of excluding other conditions and recognizing comorbid disorders, clinicians unfamiliar with these disorders may need to refer patients identified by using such criteria to a clinician familiar with these conditions and with FM to confirm the diagnosis.

FMS continues to be a difficult diagnosis for many primary care clinicians[26]. They typically refer patients to rheumatologists, but most rheumatologists, as demonstrated in a study of Canadian physicians, do not provide primary care for FM, and several do not see patients with FM[27]. Many Canadian rheumatologists in another study did not utilize published FMS diagnostic criteria to make the diagnosis in

their practices[28]. The diagnosis of FMS, like headaches, chronic low back pain, and depression, can generally be made in the primary care setting, although many barriers exist for a timely diagnosis of FM in primary care. Despite improved awareness among primary care clinicians, many continue to be uncomfortable with a diagnosis of FMS. There are no objective physical, laboratory, or imaging abnormalities, and the diagnosis is based on subjective reporting of symptoms.

In several studies, it was stated that FMS negatively affected the quality of life of relatives and spouses alongside patients affected by associated physical, psychological disorders, and mental health problems[29-31].

Our aim of this study was to investigate the effect of FMS on the quality of life, psychological condition, and sleep quality of affected female patients and their spouses compared to women without FMS and their women's spouses.

Patients and Methods

Our study is an analytical case-control type survey study. Ethics Committee approval for our study was obtained from the Dicle University School of Medicine Non-Invasive Research Ethics Committee (22.05.2013/225). Thirty female patients diagnosed with FM and their spouses, and 38 healthy women and their spouses similar in age to these patients voluntarily participated in our study. The patient and control group couples were staying in the same house and sleeping in the same bed. All participants were admitted to the Physical Medicine and Rehabilitation and Family Medicine outpatient clinics of Dicle University School of Medicine Hospital.

The diagnosis of the patients was made according to the ACR. Turkish versions of Short Form-36 (SF-36), The Hospital Anxiety and Depression Scale (HADS), and The Pittsburgh Sleep Quality Index (PSQI) questionnaires with validity and reliability were applied to all participants. In addition to these questionnaires, a socio-demographic data form containing questions such as age, gender, marital status, and educational status was also filled.

The questionnaires were conducted face-to-face by the researchers without any intervention to the participants. Patient, patient spouse, control, and control spouse, for a total of 136 participants, attention was paid to the absence of psychiatric diseases or systemic/metabolic disorders, which were the exclusion criteria, and the participants were included in the study accordingly. Any laboratory/imaging method was not used in our study.

The quality of life of all participants in the patient and control groups was evaluated using the SF-36 questionnaire, which includes the following eight sections: physical functioning (PF), role limitations resulting from physical problems (PR), role limitations resulting from emotional problems (ER), social functioning (SF), mental health (MH), energy/vitality (EVT), bodily pain (BP), and general health (GH). Each section is evaluated individually and scored from 0 to 100. The validity and reliability of the Turkish version of the questionnaire were demonstrated by Kocyigit et al[32].

HADS: In the patient, to determine the risk regarding anxiety and depression, HADS was applied. The scale was developed by Zigmond and Snaith[33] to measure the level and change of violence and adapted to Turkish by Aydemir et al[34]. It is a self-rating scale consisting of 14 items with seven depression subscales (even numbers) and seven of their anxiety (odd numbers) symptoms. It is evaluated in a four-point Likert format and is scored between 0-3.

PSQI: The index was developed by Buysse et al[35] with sufficient internal consistency (Cronbach alpha = 0.80), and test-retest reliability and validity. The validity of PSQI in Turkey and its reliability was demonstrated in a study by Ağargün et al[36]. In this study, Cronbach's alpha value was 0.79 (Cronbach alpha = 0.79). The PSQI assesses sleep quality over months with 24 questions. While 19 questions were answered by the patients, 5 questions were answered by spouses. The questions answered by the spouses were not consideration. These seven sub-dimensions are subjective sleep quality (component 1), sleep latency (component 2), sleep duration (component 3), habitual sleep efficiency (component 4), sleep disturbance (component 5), sleep drug use (component 6), and daytime function disorder (component 7). Seven component scores give the total PSQI score. Each response is scored between 0-3 according to the symptom frequency. The total score is between 0-21. A high level of sleep disturbance is indicated by a high score, displaying poor sleep. A total score above five clinically displays poor sleep quality.

Statistical Analysis

The statistical analyses were carried out using SPSS 24.0 for Windows (SPSS IBM, Armonk, NY, USA). Distributions of parametric variables were evaluated with the one-sample Kolmogorov-Smirnov test. The independent-samples *t*-test was used if the data were normally distributed, and the Mann–Whitney U test was used if the data were skewed to compare independent samples. Pearson's correlation test was used to determine the relationships between variables. All demographic and quantitative data were expressed as mean ± SD. Differences with *p*-values of ≤0.05 were statistically significant, and all results are expressed with a 95% confidence interval.

Results

A total of 136 people, including women with FMS (n=30), spouses of FMS women (n=30), non-FMS control women (n=38), and spouses of the control women (n=38), were included in the study. The patient and control groups were similar in age and gender. However, participants in the study group had higher mean Body Mass Indexes (BMIs) compared to controls (Table I).

Quality of life and its' sub-scales (using the SF-36 quality of life index), depression, and anxiety status (using the HAD scale) differed significantly between the patients and controls and between their spouses. There were no significant differences between the groups regarding the mean SF-36/SF. Additionally, there was no significant difference between the spouses of the patients and controls regarding the mean PSQI values (Table II).

SD: Standard deviation, HADSa: Hospital Anxiety Depression Scala for anxiety, HADSd: Hospital Anxiety Depression Scala for depression. SF-36: Short form 36, PF: Physical Function, PR: Physical Role, BP: Body Pain, GH: General Health, EVT: Energy/Vitality, SF: Social Function, ER: Emotional Role, MH: Mental Health, PSQI: Pittsburgh Sleep Quality Index

Discussion

Although there are many scientific articles on quality of life, depression, anxiety, sleep state, and other clinical conditions in female patients with FMS, there are quite a few studies on spouses of these patients. In our study, comparisons were made not only between women with FMS and healthy women in the control group but also between the spouses of women with FMS and healthy control group women. Therefore, we hope that the results of our study, especially regarding the spouses of patients with FMS, will contribute to the scientific literature.

In our study, depression and anxiety scores in the patient group were significantly higher in the patient and patient spouses group compared to the control and control partners. In a study by Tutoglu et al[37], the depression score was higher and significant in patients with FMS and their spouses compared to the control and control

Table I. Comparison of basic features between the groups.

	Patient		Control			Patient spouse		Control spouse		
	Mean/ n	SD/ %	Mean/ n	SD/ %	*p*	Mean/ n	SD/ %	Mean/ n	SD/ %	*p*
Age (years)	42.1	8.12	41.87	10.4	0.921*	48.2	9.43	45.03	10.65	0.204
BMI	26.7	3.64	24.46	3.55	0.018*	27.3	3.56	25.89	2.45	0.075
Education										
Primary sch. or less	15	50	13	34.2	0.107#	7	23.3	4	10.5	0.181#
Highschool	6	20	4	10.5		8	26.7	7	18.4	
University and above	9	30	21	55.3		15	50	27	71.1	
Smoking										
Yes	6	20	4	10.5	0.318$	12	40	12	31.6	0.471#
No	24	80	34	89.5		18	60	26	68.4	
Systemic disease										
Yes	7	23.3	6	15.8	0.432#	5	16.7	8	21.1	0.648#
No	23	76.7	32	84.2		25	83.3	30	78.9	

*Independent samples *t*-test, #Chi-square test, $Fisher's exact test. BMI: Body Mass Index.

Table II. Comparison of life quality variables between the groups.

	Patient		Control			Patient spouse		Control spouse		
	Mean	SD	Mean	SD	*p*	Mean	SD	Mean	SD	*p*
HAD/anxiety	10.6	4.21	5.79	4.45	**< 0.001***	6.1	2.77	4.29	3.3	**0.019***
HAD/depression	9.9	4.08	4.39	3.49	**< 0.001***	6.9	3.46	3.71	3.38	**< 0.001***
SF-36/PF	54	21.67	83.42	17.94	**< 0.001***	75.83	20.3	87.89	14.22	**0.014**[#]
SF-36/PR	28.33	33.95	83.55	32.51	**< 0.001***	55.0	37.94	86.84	28.32	**< 0.001**[#]
SF-36/BP	39.33	20.13	82.3	19.53	**< 0.001***	69.0	24.96	84.08	18.44	**0.006***
SF-36/GH	35.13	11.77	61.81	15.58	**< 0.001***	53.36	17.35	62.85	14.87	**0.018***
SF-36/EVT	32.17	13.63	57.37	17.96	**< 0.001***	51.5	18.06	65	14.47	**0.001***
SF-36/SF	53.92	19.83	49.67	11.44	0.995[#]	57.08	18.18	53.29	7.51	**0.995**[#]
SF-36/ER	38.89	39.23	70.17	38.59	**0.002***	54.44	39.62	82.45	25.4	**0.002**[#]
SF-36/MH	45.07	17.39	67.16	13.22	**0.006**[#]	63.87	14.31	73.37	12.17	**0.004***
PSQI	9.1	3.62	5.23	2.59	**< 0.001**[#]	5.23	2.6	4.37	2.01	0.126*

*Independent samples *t*-test, [#]Mann-Whitney U test. SD: Standard deviation, HADSa: Hospital Anxiety Depression Scala for anxiety, HADSd: Hospital Anxiety Depression Scala for depression. SF-36: Short form 36, PF: Physical Function, PR: Physical Role, BP: Body Pain, GH: General Health, EVT: Energy/Vitality, SF: Social Function, ER: Emotional Role, MH: Mental Health, PSQI: Pittsburgh Sleep Quality Index.

partners, similar to our study. However, while the anxiety scores were higher in favour of the patient in comparing the patient and control, the anxiety score was higher in the patient's spouse and was not significant in comparing the patient's spouse and control partner. In the study, unlike us, for depression and anxiety. Notably, while the Back Depression Index (BDI) and Back Anxiety Index (BAI) were used for depression and anxiety scores in the study conducted by Tutoglu et al[36], HAD was used in the our study. Dogan et al[38] used BDI and BAI in their study, similar to study of Tutoglu et al[36] and in contrast to our study, reported no significant difference in the BDI and BAI scores between the spouses of patients with FMS and the control subjects. However, similar to the findings of Dogan et al[38], there was no significant difference in the BAI score between patients with FMS and the control subjects.

In our study, in the quality-of-life assessment we performed using SF-36, a significant difference was found in all sub-evaluations except SF, both in patients with FMS compared to the control group and in patients with FMS compared to the spouses of the control group. Tutoglu et al[37], in their study using SF-36, found PR and ER to be significant in quality-of-life parameters in a comparison between spouses of patients with FM and control partners, while no significant difference was found in the other six sub-parameters.

In a study conducted by Kim et al[39], 2098 patients with FMS were recruited, and 92% of these patients were women. Health-related quality of life (HRQOL) was found to be low. Since there is a lack of scientific studies on the patient's spouse and control spouse, more studies are required on FMS partners, especially psychological, physical, mental, and sleep conditions, and life mentality. With diseases that affect many lives negatively for a long time, we should consider the spouses of those with FMS, and question and follow up according to the situation if female patients are suffering from FMS in all health institutions, especially in primary care. In this percentage, we believe that we should consider the spouses of these women patients and take steps to protect their health.

Similar to our study, Salaffi et al[40], patients with FMS and patients with rheumatoid arthritis were compared to the healthy population in their study using SF-36 and found a significant difference in all sub-parameters of SF-36. In our study, there was no significant difference, only in the SF parameter of SF-36.

In our study, the PSQI scores of the patients with FMS were significantly worse regarding sleep quality than the control group. In comparing the spouses of the patients and the control partners, the PSQI scores were worse in the spouses of the patients but were not significant. In a meta-analysis conducted by Wu et al[41], it was stated that FMS patients were found to be higher and significant in sleep evaluation compared to control groups. However, in this meta-analysis, there are no studies involving the spouses of the patients. Similar to our study, in the study conducted by Dursun et

al[42], a significant difference was found between the spouses of patients with FMS and their control group sleep quality scores. However, this study is also one in which the spouses of the patients did not participate in the study.

Since we did not investigate personality traits in FMS patients in our study, it is necessary to investigate the effect of this disease on personality. Because it can be thought that this disease, which has negative effects on quality of life, sleep quality and psychological effects, may also affect personality traits.

As we have seen in most of these studies which we cited, evaluating the quality of life of women with FMS compared to the control group or the general population revealed that the quality of life was affected in almost all of them, consistent with our study, and this difference was significant. However, considering that the disease is observed nine times more in women than men, it is apparent that there are very few studies regarding the effect of FMS on men who live with these diagnosed women. Therefore, we think that further and more comprehensive studies are necessary to evaluate the quality of life of the spouses of women with FMS. We believe that in this disease, which is observed between 2-4% in the population and negatively affects the quality of life, we should consider the population they live with, if any, and accordingly, we should take steps to improve their health.

Conclusions

Further studies are required regarding the spouses of women with FMS concerning depression, anxiety, and sleep quality disorders that we frequently see in women with FMS, and other psychosocial conditions that we have not mentioned here. Because in our study, it was determined that women with FMS have worse quality of life, depression, anxiety, and sleep quality than healthy women. We were surprised by the fact that there was no significant difference in the sleep quality, although the quality of life and depression and anxiety scores were even negative in the spouses of women with FMS. It was thought-provoking that sleep was not examined while almost all parameters were affected in spouses as well as patients. In conclusion, their spouses should be evaluated alongside women with FMS regarding the quality of life, anxiety, depression, and sleep quality.

Conflict of Interest

The Authors declare that they have no conflict of interests.

Authors' Contribution

We certify that all individuals listed as authors of this manuscript: 1) have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) have been involved in drafting the manuscript or revising it critically for important intellectual content; 3) have given final approval of the version to be published; and 4) agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Celepkolu T, designed the study and he mostly wrote the manuscript. Erten Bucaktepe P.G, contributed to the conception and design of the study and she made statistical analyses as well as assisted writing the manuscript. Yilmaz A, made the interpretation of the data, and he assisted with writing and editing the manuscript. Demir Pervane V, made collection and interpretation of the data, and she assisted with writing the manuscript. Batmaz I, made the interpretation of the data, and he assisted with writing and editing the manuscript. Sariyildiz M.A, to the conception and design of the study, and he assisted collection and interpretation of the data.

References

1) Leslie J. Crofford. Fibromyalgia. Firestein&Kelley's Textbook of Rheumatology. Elsevier. Eleventh Edition, Volume 1; 2021: 825-840.
2) Clauw DJ. Fibromyalgia: a clinical review. JAMA 2014; 311: 1547-1555.
3) Heidari F, Afshari M, Moosazadeh M. Prevalance of fibromyalgia in general population and patients, a systematic review and meta-analysis. Rheumatol Int 2017; 37: 1527-1539.
4) Wolfe F, Smythe HA, Yunus MB, Bennett RM, Bombardier C, Goldenberg DL, Tugwell P, Campbrll SM, Abeles M, Clark P, Fam AG, Fiechtner JJ, Franklin CM, Gatter RA, Hamaty D, Lessard J, Lichtbroun AS, Masi AT, Mccain GA, Reynolds WJ, Romano TJ, Russell J, Sheon RP. The american college of rheumatology 1990 criteria for the classification of fibromyalgia. Report of the multicenter criteria committee. Arthritis Rheum 1990; 33: 160-172.
5) Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Katz RS, Mease P, Russell AS, Russell IJ, Winfield JB, Yunus MB. The american college of rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. Arthritis Care Res 2010; 62: 600-610.
6) Häuser W, Ablin J, Fitzcharles MA, Littlejohn G, Luciano JV, Usui C, Walitt B. Fibromyalgia. Nat Rev Dis Primers 2015; 1: 1-16.
7) Carmona L, Ballina J, Gabriel R, Laffon A. The burden of musculoskeletal diseases in the gener-

al population of Spain: results from a national survey. Ann Rheum Dis 2001; 60: 1040-1045.

8) Gamero Ruiz F, Gabriel Sánchez R, Carbonell Abello J, Tornero Molina J, Sánchez-Magro I. Pain in spanish rheumatology outpatient offices: EPIDOR epidemiological study. Rev Clin Esp 2005; 205: 157-163.

9) Vincent A, Lahr BD, Wolfe F, Clauw DJ, Whipple MO, Oh TH, Barton DL, St Sauver J. Prevalence of fibromyalgia: a population-based study in Olmsted County, Minnesota, utilizing the Rochester Epidemiology Project. Arthritis Care Res (Hoboken) 2013; 65: 786-792.

10) Wolfe F, Ross K, Anderson J, Russell IJ, Hebert L. The prevalence and characteristics of fibromyalgia in the general population. Arthritis Rheum 1995; 38: 19-28.

11) Jones GT, Atzeni F, Beasley M, Flüß E, Sarzi-Puttini P, Macfarlaneet GJ. The prevalence of fibromyalgia in the general population: a comparison of the American College of Rheumatology 1990, 2010, and modified 2010 classification criteria. Arthritis Rheumatol 2015; 67: 568-575.

12) Walitt B, Nahin RL, Katz RS, Bergman, MJ, Wolfe, F. The Prevalence and Characteristics of Fibromyalgia in the 2012 National Health Interview Survey. PLoS One 2015; 10: 1-16.

13) Ting TV, Barnett K, Lynch-Jordan A, Whitacre C, Henrickson M, Kashikar-Zuck, S. 2010 American College of Rheumatology Adult Fibromyalgia Criteria for Use in an Adolescent Female Population with Juvenile Fibromyalgia. J Pediatr 2016; 169: 181-187.

14) Fayaz A, Croft P, Langford RM, Donaldson LJ, Jones GT. Prevalence of chronic pain in the UK: a systematic review and meta-analysis of population studies. BMJ Open 2016; 6: 1-12.

15) Collin SM, Bakken IJ, Nazareth I, Crawley E, White PD. Trends in the incidence of chronic fatigue syndrome and fibromyalgia in the UK, 2001-2013: a Clinical Practice Research Datalink study. J R Soc Med 2017; 110: 231-244.

16) Bernatsky S, Dobkin PL, De Civita M, Penrod JR. Co-morbidity and physician use in fibromyalgia. Swiss Med Wkly 2005; 135: 76-81.

17) Villarraga AR, Castellanos ALZ, Anaya JM, Tamayo RP. Predictores de calidad de vidaenpacientes con fibromialgia [Predictors of quality of life in patients with fibromyalgia]. Rev Colomb Reumatol 2005; 12: 295-300.

18) Torres Villar OC, Martínez Barreira A, Soriano Villanueva DL, Fernández-Vergel R, Luciano JV, Peñarrubia-María MT. Relationship between comorbodity and functional status in primary care patients with fibromyalgia. Butlletí 2013; 31: 1-19.

19) Theoharides TC, Tsilioni I, Bawazeer M. Mast Cells, Neuroinflammation and Pain in Fibromyalgia Syndrome. Front Cell Neurosci 2019; 13: 1-8.

20) Nacul L, O'Boyle S, Palla L, Nacul FE, Mudie K, Kingdon CC, Cliff JM, Clark TG, Dockrell HM, Lacerda EM. How Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) Progresses: The Natural History of ME/CFS. Front Neurol 2020; 11: 1-13.

21) Nishioka K, Hayashi T, Suzuki M, Li Y, Nakayama S, Matsushima T, Usui C, Shibata N, Motoi Y, Tanaka R, Nishioka K, Hattori N. Fibromyalgia syndrome and cognitive dysfunction in elderly: a case series. Int J Rheum Dis 2016; 19: 21-29

22) Lodahl M, Treister R, Oaklander AL. Specific symptoms may discriminate between fibromyalgia patients with vs. without objective test evidence of small-fiber polyneuropathy. Pain Rep 2018; 3: 1-6.

23) Caro XJ, Galbraith RG, Winter EF. Evidence of peripheral large nerve involvement in fibromyalgia: a retrospective review of EMG and nerve conduction findings in 55 FM subjects. Eur J Rheumatol 2018; 5: 104-110.

24) Goldenberg DL. Diagnosing Fibromyalgia as a Disease, an Illness, a State, or a Trait? Arthritis Care Res 2019; 71: 334-336.

25) Arnold LM, Bennett RM, Crofford LJ, Dean LE, Clauw DJ, Goldenberg DL, Fitzcharles MA, Paiva ES, Staud R, Puttini PS, Buscila D, Macfarlane GJ. AAPT Diagnostic Criteria for Fibromyalgia. J Pain 2019; 20: 611-628.

26) Hadker N, Garg S, Chandran AB, Crean SM, McNett MM, Silverman SL. Efficient practices associated with diagnosis, treatment and management of fibromyalgia among primary care physicians. Pain Res Manag 2011; 16: 440-444.

27) Agarwal A, Oparin Y, Glick L, Fitzcharles MA, Adachi JD, Cooper MD, Lucas G, Laura W, Jason B. Attitudes Toward and Management of Fibromyalgia: A National Survey of Canadian Rheumatologists and Critical Appraisal of Guidelines. J Clin Rheumatol 2018; 24: 243-249.

28) Kumbhare D, Ahmed S, Sander T, Grosman-Rimon L, Srbley J. A Survey of Physicians' Knowledge and Adherence to the Diagnostic Criteria for Fibromyalgia. Pain Med 2018; 19: 1254-1264.

29) Epstein SA, Kay G, Clauw D, Heaton R, Klein D, Krupp L, Kuck J, Leslie V, Masur D, Wagner M, Waid R, Zisook S. Psychiatric disorders in patients with fibromyalgia. A multicenter investigation. Psychosomatics 1999; 40: 57-63.

30) Raphael KG, Janal MN, Nayak S, Schwartz JE, Gallagher RM. Familial aggregation of depression in fibromyalgia: a community-based test of alternate hypotheses. Pain 2004; 110: 449-460.

31) Arnold LM, Hudson JI, Hess EV, Ware AE, Fritz DA, Auchenbach MB, Starck LO, Keck Jr PE. Family study of fibromyalgia. Arthr Rheum 2004; 50: 944-952.

32) Kocyigit H, Aydemir O, Fisek G, Olmez N, Memis A. The validity and reliability of Turkish version of short form 36 (SF-36). Ilac ve Tedavi Dergisi 1999; 112: 102-106.

33) Zigmond AS, Snaith RP. The Hospital Anxiety Depression Scala. Acta Psychiatr Scand 1983; 67: 361-370

34) Aydemir O, Guvenir T, Kuey L, Kultur S. Validity and reliability of Turkish version of hospital anxiety and depression scale. Turkish J Psychiatry 1997; 8: 280-287.

35) Buysse DJ, Reynolds CF, Monk TM, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: A new Instrument for Psychiatric Practice and Research. Psychiatry Res 1989; 28: 193-213

36) Ağargün MY, Kara H, Anlar Ö. The validity and reliability of the Pittsburgh sleep quality index. Turk J Psychiatry 1996; 7: 107-115.

37) Tutoglu A, Boyaci A, Koca I, Celen E, Korkmaz N. Quality of life, depression, and sexual dysfunction in spouses of female patients with fibromyalgia. Rheumatol Int 2014; 34: 1079-1084.

38) Dogan SK, Aytur YK, Atbasoglu C. Assessment of the relatives or spouses cohabiting with the fibromyalgia patients: is there a link regarding fibromyalgia symptoms, quality of life, general health and psychologic status? Rheumatol Int 2011; 31: 1137-1142.

39) Kim SK, Kim SH, Lee CK, Lee HS, Lee SH, Park YB, Park HJ, Son MJ, Lee SS. Effect of fibromyalgia syndrome on the health-related quality of life and economic burden in Korea. Rheumatology 2013; 52: 311-320.

40) Salaffi F, Sarzi-Puttini P, Girolimetti R, Atzeni F, Gasparini S, Grassi W. Health-related quality of life in fibromyalgia patients: a comparison with rheumatoid arthritis patients and the general population using the SF-36 health survey. Clin Exp Rheumatol 2009; 27: 67-74.

41) Wu YL, Chang LY, Lee HC, Fang SC, Tsai PS. Sleep disturbances in fibromyalgia: A meta-analysis of case-control studies. J Psychosom Res 2017; 96: 89-97.

42) Dursun M, Besiroglu H, Tellioglu E, Saglam Y, Ortac M. Association Between Sexual Dysfunction, Sleep Impairment and Depression in Women with Fibromyalgia. Sex Disabil 2020; 38: 261-269.