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Original Article

# The influence of social support on pain, symptom severity, and quality of life in fibromyalgia

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***ABSTRACT***

**Objectives:** The aim of this study was to examine the potential effects of social support levels and different types of social support on pain and symptom severity, and quality of life in patients with fibromyalgia (FM).

**Patients and methods:** A total of 169 female patients (mean age: 49.6±9.3 years; range, 20 to 76 years) diagnosed with FM were included between June 2023 and November 2023. Based on the Medical Outcome Study Social Support Scale (MOS-SSS), those scoring below the 25th percentile were categorized as the poor social support group (PSS; n=42) and those above the 25th percentile as the normal social support group (NSS; n=127). Outcome measures were Visual Analog Scale (VAS), pressure pain threshold (PPTh) and pressure pain tolerance (PPTo), Fibromyalgia Impact Questionnaire (FIQ) and Nottingham Health Profile (NHP) scores.

**Results:** The PSS group had higher FIQ scores ($p<0.0001$), lower PPTh ($p=0.003$) and PPTo ($p<0.0001$) levels, and higher VAS scores ($p=0.01$). Significant differences were found in the NHP subscales of pain, emotional reaction, social isolation, and sleep in favor of the NSS group. Most types of social support were found to be negatively correlated with VAS and positively correlated with pressure-related pain measurements. Only positive social interaction subscale was not correlated with VAS ($r=-0.13$, $p=0.08$), and emotional/informational support subscale was not correlated with PPTh ($r=0.14$, $p=0.06$).

**Conclusion:** Our study results suggest that low social support in FM patients is associated with higher pain perception, lower pain threshold, and quality of life.

***Keywords:*** Fibromyalgia, pain, quality of life, social support, symptom severity.

Fibromyalgia (FM) is a chronic disease with symptoms such as widespread pain, fatigue, and sleep disorders.[1] It primarily affects women and is more common in individuals with lower socioeconomic status, those living in rural areas, and those with obesity. Its global prevalence is approximately 2.7%.[2] Although its pathophysiology is not definitive, current understanding suggests a dysfunction in central pain processing. Additionally, it is thought that psychological and behavioral factors contribute to the disease's development. Several studies have shown that psychological disorders and stress can amplify the intensity of pain experienced by patients.[1,3] Similar to many diseases known to cause significant disability, FM substantially reduces (QoL), and patients often complain that their ability to work is affected due to pain, fatigue, and weakness.[4]

Patients with FM often encounter skepticism and insufficient support from family, friends, and medical professionals, mainly due to the invisible nature of their disabilities. This skepticism can worsen their physical and emotional distress.[5] Difficulty in identifying and expressing emotions (alexithymia), which is commonly observed in FM patients, has been found to be associated with reduced social support and heightened pain perception. The pain and other symptoms associated with FM can lead to

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reduced social interactions, contributing to social isolation.[6] Chronic pain patients have been shown to often receive inadequate social support and struggle to seek help from others.[7] A long-term study conducted in patients with rheumatoid arthritis found that social support was effective in maintaining functional ability and reducing pain severity.[8] Social support can function as a buffering mechanism against stress, positively influencing both pain perception and the psychological well-being of chronic pain patients.[9]

Social support mainly refers to the functions performed for the individual by the primary environment. It consists of emotional support, informational support (providing advice and necessary information), tangible assistance, empathy, expressions of love and affection, and participation in social activities.[10] Previous studies have considered social support an important factor in the prevention and treatment of physical and mental disorders, and chronic diseases.[8,11,12] Therefore, given its multi-layered nature, social support should be addressed as part of the biopsychosocial approach.

The present study, which focuses on the perceived social support among women with FM, differs from previous research in several key aspects. First, it provides a comprehensive examination of the subtypes of social support in FM, thereby revealing not only the “presence” of support but also “how” support is received. In addition, it evaluates the relationship between social support and both subjective and objective pain levels, as well as pharmacological treatments. Furthermore, considering that sociocultural dynamics may influence both the interpretation of the illness and the perception of social support, this study specifically focuses on a sample of Turkish women with FM. In this context, we hypothesized that FM patients with low social support would have higher pain perception, lower pain threshold and tolerance, and an impaired QoL. We, therefore, aimed to investigate how social support affected pain perception, pain thresholds, pain tolerance, and overall QoL among patients with FM and to uncover the distinct roles various forms of social support play in managing this ailment.

## PATIENTS AND METHODS

This single-center, cross-sectional study was conducted at Eskişehir City Hospital, Department of Physical Medicine and Rehabilitation between June 2023 and November 2023. Patients with FM were diagnosed using the criteria established by 2016 by the American College of Rheumatology (ACR).[13] Other inclusion criteria were being between 18 and 65 years of age, understanding the study objectives, and being able to answer the questions. Exclusion criteria were refusal to participate in the study, rheumatic or autoimmune diseases such as rheumatoid arthritis, systemic lupus erythematosus, and gout, malignancy, neurological diseases, psychiatric diseases and pregnancy. Finally, a total of 169 female patients (mean age: 49.6±9.3 years; range, 20 to 76 years) diagnosed with FM were recruited. Written informed consent was obtained from each patient. The study protocol was approved by the Eskişehir City Hospital Non-Interventional Clinical Research Ethics Committee (Date: 20.06.2023, No: ESH/GOEK2023/39). The study was conducted in accordance with the principles of the Declaration of Helsinki.

### Data collection

Patients' age, education level, marital status, and history of medication use for FM were recorded through inquiry. The medications used for FM treatment were categorized as follows: non-steroidal anti-inflammatory drugs, myorelaxants, serotonin-norepinephrine reuptake inhibitors or tricyclic antidepressants (SNRI/TCA), anticonvulsant (pregabalin), and combination pharmacotherapy (defined as the concurrent use of SNRI/TCA and pregabalin).

To evaluate the social support perceptions of the participants, the Medical Outcome Study Social Support Scale (MOS-SSS) was utilized. This scale comprises 19 items and measures social support across four primary dimensions: emotional/informational, positive social interactions, affectionate, and tangible support.[10] The questionnaire was translated from its original English into Turkish and its validity and reliability were evaluated by Yılmaz and Bozo.[14] It demonstrated an internal consistency reliability of 0.96 and a test-retest reliability of 0.73. Individuals scoring in the lowest 25th percentile of the MOS-SSS were classified under poor social support (PSS; Group 1, n=42), whereas those scoring above this threshold were classified as having normal social support (NSS; Group 2, n=127), consistent with findings from prior research.[15]

The level of pain was determined by the patient using a 0-10 cm Visual Analog Scale (VAS).

In addition, pressure pain threshold (PPTh) and pressure pain tolerance (PPTo) were measured using an algometer (Baseline® Dolorimeter, NY, USA). While the patient sat in an upright position, a 1.52 $\text{cm}^2$ flat circular probe was placed on the upper trapezius muscle of the dominant extremity, perpendicular to the skin. Before the measurement, the procedure was explained to the patient. The value at which the patient reported feeling pain was recorded as PPTh, and the value at which the patient stated they could no longer tolerate pressure was recorded as PPTol in pounds (lb). The upper trapezius muscle was preferred, as it is one of the common pain points in FM patients, is accessible and allows for the ability to follow a standard methodology.[16]

General health status and disease-related QoL were evaluated using the Nottingham Health Profile (NHP) scale. The NHP contains 38 items in total and assesses the health profile in six subsections (physical activity, pain, energy, social isolation, emotional reaction and sleep). Each item is answered with Yes or No. The item answered with "Yes" is scored with a weighted value assigned to it. The total score for each section ranges from 0 to 100.[17]

The Turkish version of the Fibromyalgia Impact Questionnaire (FIQ) was used to assess multiple symptom domains associated with FM. It is a 21-question questionnaire consisting of three sections: functions, general impact, and symptoms. The study on the validity and reliability in Turkish was conducted by Ediz et al.[18]

### Statistical analysis

Study power analysis and sample size calculation were performed using the G*Power version 3.1.9 software (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany). Considering an alpha error level of 5%, an effect size of 0.6, and a statistical power of 95%, the minimum required sample size for each group was calculated. This analysis was based on a previous study design, the target number of participants was determined as 42 for Group 1 and 127 for Group 2.[15]

Statistical analysis was performed using the IBM SPSS version 21.0 software (IBM Corp., Armonk, NY, USA). The distribution of each continuous variable was tested for normality using the Shapiro-Wilk test. Descriptive data were presented in mean ± standard deviation (SD), median and interquartile range (IQR) or number and frequency, where applicable. Depending on the distribution of the data, parametric and nonparametric tests were applied to compare the groups. Independent samples t-test and Mann-Whitney U test were used to compare independent groups according to distribution forms. The chi-square test was used to compare categorical

**TABLE 1**
Demographic and clinical characteristics of participants

| | Group 1 (n=42) | | | Group 2 (n=127) | | | |
|---|---|---|---|---|---|---|---|
| | n | % | Mean±SD | n | % | Mean±SD | *p* |
| Age (year) | | | 50.3±8.6 | | | 49.3±9.5 | 0.545$^{a}$ |
| Education | | | | | | | 0.747$^{b}$ |
| Elementary (incompleted) | 9 | 21.4 | | 19 | 14.9 | | |
| Elementary | 20 | 47.6 | | 61 | 48.03 | | |
| Secondary | 10 | 23.8 | | 34 | 26.7 | | |
| University | 3 | 7.1 | | 13 | 10.2 | | |
| Marital status | | | | | | | 0.135$^{b}$ |
| Not married | 6 | 14.2 | | 12 | 9.4 | | |
| Married | 34 | 80.9 | | 114 | 89.7 | | |
| Widowed | 2 | 4.7 | | 1 | 0.7 | | |
| Medications | | | | | | | |
| NSAIDs | 14 | 33.3 | | 30 | 23.6 | | 0.298$^{b}$ |
| Myorelaxants | 9 | 21.4 | | 32 | 25.1 | | 0.775$^{b}$ |
| SNRI/TCA | 26 | 61.9 | | 77 | 60.6 | | 1.000$^{b}$ |
| Anticonvulsant | 4 | 9.5 | | 8 | 6.2 | | 0.495$^{c}$ |
| Combined therapy | 3 | 7.1 | | 6 | 4.9 | | 0.692$^{c}$ |
| Not using | 8 | 19 | | 32 | 25.1 | | 0.416$^{b}$ |

SD: Standard deviation; SNRI: Serotonin and norepinephrine reuptake inhibitors; NSAIDs: Non-steroidal anti-inflammatory drugs; SNRI: Serotonin-norepinephrine reuptake inhibitors; TCA: Tricyclic antidepressant; Significance level $p<0.05$; $^{a}$ Two independent samples t-test *p* value; $^{b}$ Chi-square test; $^{c}$ Fisher exact test.

**TABLE 2**

Comparison of clinical outcome scores of groups

| | Group 1 (n=42) | | Group 2 (n=127) | | |
|---|---|---|---|---|---|
| | Median | Q1-Q3 | Median | Q1-Q3 | *p* |
| Visual Analog Scale | 8 | 6-9 | 7 | 6-8 | **0.01** |
| Pressure pain | | | | | |
| Pain threshold | 8 | 8-11 | 10 | 8-14 | **0.003** |
| Pain tolerance | 14 | 11-17 | 17 | 14-22 | **<0.0001** |
| Fibromyalgia impact questionnaire | 61.41 | 53.04-76.16 | 45.66 | 35.83-59.66 | **<0.0001** |
| Nottingham health profile | | | | | |
| Pain | 70.26 | 44.39-100 | 58.78 | 33.09-72.45 | **0.002** |
| Physical activity | 32.56 | 21.36-53.4 | 32.04 | 21.36-43.29 | 0.97 |
| Emotional reaction | 48.60 | 27.00-76.88 | 33.73 | 17.55-64.73 | **0.006** |
| Social isolation | 57.30 | 22.01-100 | 37.98 | 0-58.34 | **0.003** |
| Sleep | 76.41 | 38.30-83.90 | 55.93 | 27.26-77.63 | **0.04** |
| Energy | 100 | 90.80-100 | 100 | 63.20-100 | 0.11 |

Q: Quartile; Significance level p<0.05.

variables. Spearman correlation coefficients were calculated to determine the relationships between variables. A *p* value of <0.05 was considered statistically significant.

## RESULTS

There was no significant difference between the groups regarding demographic characteristics and FM-related medications (p>0.05) (Table 1).

Higher FIQ scores were observed in the PSS group compared to the NSS group (p<0.0001). The PSS group had lower PPTh (p=0.003) and PPTo (p<0.0001) levels and higher VAS levels (p=0.01) (Table 2).

In NHP, the subcategories of pain, emotional reaction, social isolation, and sleep were significantly different in favor of the NSS group (Table 2). A comprehensive summary of the NHP subscales is presented in Figure 1.

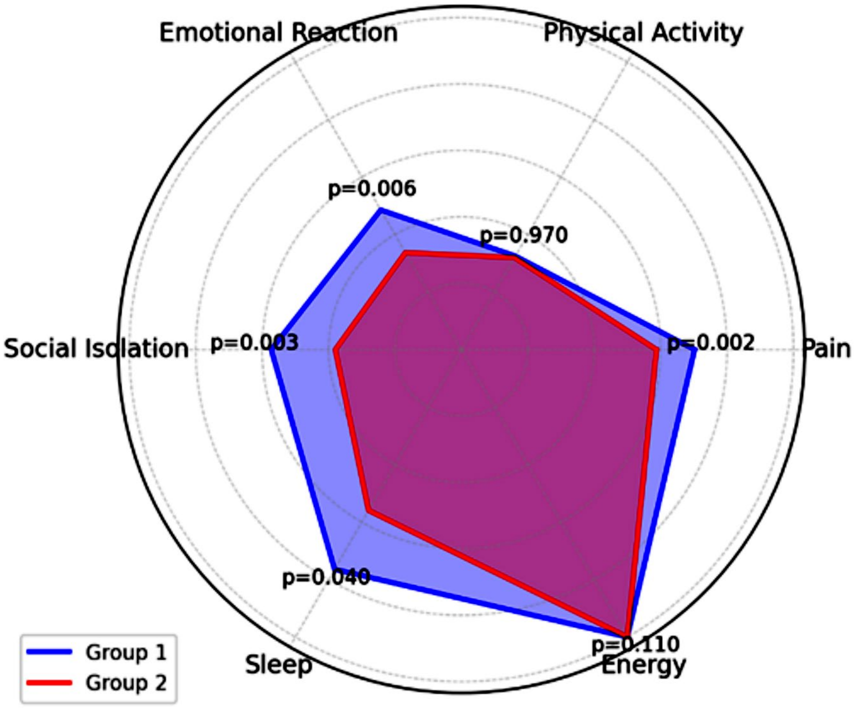

**Figure 1.** Comparison of quality of life scores between groups.

**TABLE 3**
Comparison of social support status between the two groups

| | Group 1 (n=42) | | Group 2 (n=127) | | |
|---|---|---|---|---|---|
| | Median | Q1-Q3 | Median | Q1-Q3 | $p^a$ |
| MOS-SSS | | | | | |
| Tangible | 9 | 8-11 | 15 | 13-17 | **<0.0001** |
| Affectionate | 6 | 6-8 | 11 | 9-12 | **<0.0001** |
| Positive social interaction | 9 | 8-10 | 13 | 11-14 | **<0.0001** |
| Emotional/informational | 16.5 | 14-20 | 26 | 23-30 | **<0.0001** |
| Total | 42 | 38.75-46 | 64 | 57-73 | **<0.0001** |

Q: Quartile; MOS-SSS: Medical Outcome Study Social Support Survey; Significance level p<0.05; $^a$: Mann-Whitney U test.

**TABLE 4**
Correlation between pain measures and different types of social support in FM patients

| | VAS | | PPTh | | PPTo | |
|---|---|---|---|---|---|---|
| | $r_s$ | $p$ | $r_s$ | $p$ | $r_s$ | $p$ |
| MOS-SSS | | | | | | |
| Tangible | 0.23 | **0.003** | 0.30 | **<0.0001** | 0.29 | **<0.0001** |
| Affectionate | −0.21 | **0.005** | 0.23 | **0.003** | 0.27 | **<0.0001** |
| Positive social interaction | −0.13 | 0.08 | 0.21 | 0.005 | 0.20 | **0.008** |
| Emotional/informational | −0.16 | 0.03 | 0.14 | 0.06 | 0.17 | **0.02** |
| Total | −0.22 | **0.004** | 0.24 | **0.002** | 0.26 | **0.001** |

FM: Fibromyalgia; VAS: Visual Analog Scale; PPTh: Pressure pain threshold; PPTo: Pressure pain tolerance; MOS-SSS: Medical Outcome Study Social Support Survey; $r_s$: Spearman's correlation; Significant level p<0.05.

Table 3 presents a comparison of the MOS-SSS and subcategories status between the groups. The PSS group had significantly lower scores in all MOS-SSS subscales as well as in the total score compared to the NSS group (p<0.0001).

Table 4 shows the relationships between types of social support and pain measurements in FM patients. All types of support, except for positive social interaction (r=−0.13, p=0.08), were found to be negatively correlated with the patients' VAS scores. All types of social support, except for emotional/informational support (r=0.14, p=0.06), were positively correlated with pressure-induced pain levels.

## DISCUSSION

In the present study, we examined the relationship between pain threshold, pain tolerance, and functionality of FM patients and their levels of social support. Our study results revealed that patients in the PSS group had higher VAS scores and lower PPTh and PPTo levels. Additionally, individuals with lower social support experienced more severe FM symptoms and had a greater impact on their QoL. No significant differences were observed between the groups in terms of physical activity and energy levels.

Both objective and perceived social isolation have been linked to poorer health outcomes across different age groups.[19] According to Montoya et al.,[20] social support modulates pain sensitivity at both behavioral and central nervous system levels. Galvez-Sánchez et al.[21] reported that low levels of social support may be a risk factor for poorer cognitive performance and increased depressive mood. An animal study found that social isolation reduced dendritic branching in the prefrontal cortex and hippocampus.[22] In a study involving healthy women, perceived social support was associated with brain-derived neurotrophic factor and cortisol levels.[23] These findings suggest that a supportive social environment may enhance biological resilience to stress. During the novel coronavirus disease 2019 (COVID-19) pandemic, when social interaction was significantly limited, volumetric increases were observed in the bilateral amygdala, putamen, and anterior temporal cortex, which appeared to reverse as social interaction increased.[24]

Gündüz et al.[25] reported that patients with FM perceive lower levels of social support compared to healthy controls. The aforementioned study found that decreased perceived social support was strongly associated with increased pain severity, depression, and burnout. In the literature, low perceived social support has also been shown to be associated with increased pain perception and reduced QoL in patients with chronic pain and juvenile FM.[7,26] These findings align with our results, emphasizing the clinical relevance of perceived social support in FM.

No significant difference in medication use was observed between the groups in our study. However, both pain levels and emotional state (NHP emotional reaction subscale) were found to be significantly more negative in the PSS group. A multi-center study conducted during the COVID-19 pandemic period also reported no notable change in medication use among FM patients, despite increased stressors and reduced social interaction.[27] On the other hand, a randomized-controlled study by Ghavidel-Parsa et al.[28] showed that while duloxetine and pregabalin reduced physical pain and depression levels in FM patients, they had no significant effect on social pain (invalidation). Although social experiences such as perceived support or invalidation are related to conditions such as depression and pain, they may persist independently despite psychological treatments and may exert their own distinct effects. Furthermore, the fact that only a portion of our sample used medications such as antidepressants or pregabalin may partially explain the difference observed in emotional reaction between the groups.

According to the communal coping model, individuals suffering from chronic pain may catastrophize pain to gain more attention and seek social support. This could be one of their strategies for managing the condition, although greater catastrophizing has been associated with less social support and negative feedback.[29] Moreover, patients may avoid seeking support or refrain from openly expressing their pain-related issues to avoid negative social reactions (e.g., denial of the disease's existence or accusations of exaggerating symptoms) from family, friends, or even medical professionals.[30] Such social withdrawal and indirect attempts to seek support (e.g., through body language or facial expressions) may lead to more negative responses and rejection.[31]

In our study, PPTh and PPTo values obtained from the trapezius muscle showed significant differences based on the level of social support. However, a study conducted on Brazilian women with FM reported a significant association between social support and PPTh, but not with PPTo.[15] This difference may be due to ethnic or physiological characteristics, or the larger sample size in our study, which may have allowed this relationship to become evident. In a study comparing FM patients with healthy controls, lower PPTh and higher intramuscular pressures in the trapezius muscle were found.[32] It has been shown that cognitive stress increases muscle activity and that the trapezius muscle in particular gives a strong motor response to this situation. Motor unit activity patterns may contribute to the chronicity of pain by working together with other pain triggering mechanisms.[33] Johansson and Sojka[34] suggested that muscle pain was often caused by static and monotonous contractions, leading over time to muscle stiffness and tension, which might become chronic. This process may worsen with changes in metabolic activity and muscle fatigue. According to studies, lack of social support and isolation may increase pain sensitivity through the dysregulated secretion of stress hormones such as cortisol via the HPA axis, as well as through disruptions in the oxytocin system and chronic inflammation processes.[35,36]

In our study, sleep quality was significantly lower in the PSS group. This finding is consistent with previous research demonstrating an association between social support and both sleep quality and duration.[37,38] Perceived loneliness adversely affects sleep quality by increasing social threat perception and alertness levels, thereby leading to daytime functional impairments and increased fatigue and pain severity in FM patients.[19,39,40] We also found the highest scores in the energy subscale of the NHP, indicating that physical fatigue and low energy are at the forefront in FM patients.

Our findings highlighted the positive association of affectionate and tangible support with PPTh and PPTo. Freitas et al.[15] also observed a similar association between affectionate support and PPTh. Affectionate support may play an important role in pain management by enhancing patients' emotional well-being. Tangible support such as help with household chores, transportation, or financial aid can alleviate the physical burden of FM patients, who often report energy deficiency, thereby improving their pain endurance.[10] Accordingly, self-compassion programs, education of family members, and peer support groups may be helpful. Supportive communication by healthcare professionals can also facilitate coping with pain. Online and in-person support networks, along with community-based assistance programs can be effective in providing tangible support.[11,12]

In the current study, the separate identification of the relationships between different types of social support and pain levels suggests that targeted social support interventions may be more effective in pain management among FM patients. Our findings also revealed no significant difference between the groups in terms of pharmacological treatments, indicating that social support may play a significant role in pain management beyond pharmacological interventions and highlighting the need for biopsychosocial approaches in FM treatment.

Nonetheless, there are some limitations to this study. First, due to its cross-sectional design, causal relationships between variables cannot be definitively established. Another major limitation is that depression and anxiety were not directly assessed using standard psychiatric scales, which could provide valuable insights into the assessment of FM and perceived social support. Additionally, other medications used by the patients were not included in the analyses. Further comprehensive and longitudinal studies including these factors are warranted to confirm these findings.

In conclusion, among various support types, tangible and affectionate support showed the strongest associations with pain threshold and tolerance in our study. Patients with insufficient social support also reported greater social isolation. Based on these findings, we highlight the importance of incorporating targeted social support strategies into FM management. FM management should not rely solely on biomedical treatments, but rather adopt an integrated biopsychosocial approach to improve patient outcomes and overall well-being.

**Data Sharing Statement:** The data that support the findings of this study are available from the corresponding author upon reasonable request.

**Author Contributions:** Idea/concept, writing the article: G.S.; Design, control, supervision, critical review: G.S., A.M.Ç., İ.U., İ.G.G., H.M.G., C.B.; Materials, data collection and/or processing: G.S., A.M.Ç., İ.U., İ.G.G., H.M.G.; Analysis and/or interpretation: G.S., C.B.; Literature review: G.S., A.M.Ç., İ.U., İ.G.G., H.M.G.,

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