



Factors affecting pain and fatigue in females with chronic widespread pain

Gamze EKİCİ, Uğur CAVLAK, Nesrin YAĞCI, Ummuhan BAŞ ASLAN,
Tuba CAN GÜLER, Veli ÇOBANKARA

[Ekici G, Cavlak U, Yağcı N, Baş Aslan U, Can Güler T, Çobankara V. Factors affecting pain and fatigue in females with chronic widespread pain. Fizyoter Rehabil. 2009;20(2):64-69.]

Research Article

G Ekici

Ahi Evran University, School of Physical Therapy and Rehabilitation, Kırşehir, Türkiye
PT, PhD, Assist Prof

U Cavlak

Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, Türkiye
PT, PhD, Prof

N Yağcı, U Baş Aslan

Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, Türkiye
PT, PhD, Assoc Prof

T Can Güler

Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, Türkiye
PT, MSc

Veli Çobankara

Pamukkale University, Faculty of Medicine, Department of Rheumatology, Denizli, Türkiye
MD, Assoc Prof

Address correspondence to:

Yard. Doç. Dr. Gamze Ekici;
Ahi Evran Üniversitesi
Fizik Tedavi ve Rehabilitasyon
Yüksekokulu, Kırşehir, Türkiye
E-mail: fztgamze@yahoo.com

Purpose: This study was conducted to investigate factors related to pain intensity and global fatigue in females with Chronic Widespread Pain (CWP). **Material and methods:** One hundred four patients with CWP were included. The mean age was 40.28±10.82 years. Both Pain intensity and global fatigue were assessed using a Visual Analogue Scale (VAS). The Hospital Anxiety and Depression Scale was used to describe anxiety and depression symptoms. Three different questionnaires (leisure time activity, and physical activity at home, at work) were used to determine physical activity levels. Dorsal regression was used to analyze the data. **Results:** The anxiety score was the most common factor affecting pain intensity (p=0.003). On the other hand, a moderate level of physical activity at home (p=0.027), physical activity level at work (p=0.008), and the anxiety score (p=0.027) were significant factors affecting global fatigue. **Conclusion:** Our results show that anxiety is the most important factor affecting both pain and global fatigue in women with CWP. These results also support the idea that the characteristics of pain, fatigue and anxiety should be evaluated separately.

Key words: Pain, Fatigue, Physical activity, Anxiety, Depression.

Kronik yaygın ağrılı kadınlarda ağrı ve yorgunluğu etkileyen faktörler

Amaç: Bu çalışma Kronik Yaygın Ağrı'lı (KYA) kadınlarda ağrı şiddeti ve genel yorgunlukla ilişkili faktörleri incelemek amacıyla yapıldı. **Gereç ve yöntem:** KYA'lı 104 hasta dahil edildi. Yaş ortalaması 40.28±10.82 yılıdır. Hem ağrı şiddeti hem de genel yorgunluk görsel analog skalası kullanılarak değerlendirildi. Hastane Anksiyete ve Depresyon Ölçeği anksiyete ve depresyon bulgularını tanımlamak için kullanıldı. Üç farklı anket (boş zaman aktivitesi, iş ve evde fiziksel aktivite) fiziksel aktivite düzeylerini tanımlamak için kullanıldı. **Sonuçlar:** Anksiyete skoru ağrı eşliğini etkileyen en yaygın faktördü (p=0.003). Diğer taraftan, orta düzeydeki evdeki fiziksel aktivite (p=0.027), işteki fiziksel aktivite (p=0.008) ve anksiyete skoru (p=0.027) genel yorgunluğu etkileyen anlamlı faktörlerdir. **Tartışma:** Sonuçlarımız anksiyetenin KYA'lı kadınlarda ağrı ve genel yorgunluğu etkileyen en önemli faktör olduğunu göstermiştir. Bu sonuçlar ağrı, yorgunluk ve anksiyete özelliklerinin ayrıca değerlendirilmesinin gerekli olduğu düşüncesini desteklemektedir.

Anahtar kelimeler: Ağrı, Yorgunluk, Fiziksel aktivite, Anksiyete, Depresyon.

Pain is considered widespread when all of the following are present: pain in the left side of the body, pain in the right side of the body, pain above the waist, and pain below the waist. In addition, axial skeletal pain (cervical spine, anterior chest, thoracic spine, or lower back) must be present. As previously mentioned, only three studies applied the American College of Rheumatology (ACR) 1990 criteria for widespread pain.¹⁻³ Moreover, pain is considered chronic when it has been persistent or regularly recurrent for more than three months during the previous 12 months.^{1,4,5} Chronic pain is a very common problem.⁵ Patients who have experienced widespread pain for at least 3 months but do not fulfill the tender point criteria are classified as suffering from Chronic Widespread Pain (CWP) according to the ACR.^{6,7} CWP is more common among females than among males.⁸

In CWP, patients often complain about some functional symptoms associated with pain. These symptoms include fatigue, sleep disturbance, headache, migraine, variable bowel habits, and diffuse abdominal pain. Psychological comorbidity is also very high.^{9,10} Moreover, fatigue is especially prominent.⁵ Individuals with CWP often report limitations in activities of daily living, such as carrying objects, walking, and working with their hands, and demonstrate impairments in the upper- and lower-extremity functions because of pain and fatigue.⁸ Chronic pain and fatigue are inherent in CWP, according to the knowledge in the literature, in terms of the high prevalence and relevance of these symptoms.⁴

Many studies about pain complaints in patients with CWP are available in the literature, since pain is the main concern in these patients. However, fatigue is rather underemphasized. The symptoms can impact a person's whole life.⁴ These reasons prompted us to design this study to analyze the factors affecting pain and fatigue in CWP patients.

MATERIALS AND METHODS

Subjects

One hundred four female participants with

CWP were evaluated in this study. The mean age with standard deviation was 40.28 ± 10.82 years (range, 26 to 65 years). Baseline information such as weight, height, body mass index (BMI) score, years of education, work hours, employment status, living area, and social security status is given in Table 1. All patients were diagnosed by a rheumatologist according to the physical examination findings and the ACR criteria.

This study was supported and approved by the Committee on Research of Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, Turkey. It was conducted in accordance with the rules of the Declaration of Helsinki. All subjects were informed before they were interviewed in terms of the aim and procedures of the study. All gave consent to participate in the study.

Each subject was eligible for the study if she met the following inclusion criteria: being female, being between 25 and 65 years old, having a diagnosis of CWP at least 3 months according to ACR, having never been treated for CWP, and having volunteered to participate in this study. The exclusion criteria were as follows: having a diagnosis of other rheumatic diseases such as a degenerative disease, inflammatory immune disease including systemic lupus erythematosus, Sjögren's disease, polymyalgia rheumatica, connective tissue disease, polymyositis/dermatomyositis and anemia, chronic infection, neuro-musculoskeletal problems, cardiovascular diseases, or somatic or severe psychiatric disorders.

One hundred forty-three patients suffering from CWP were recruited from Pamukkale University in Denizli and Hacettepe University in Ankara. Thirty-nine patients were excluded based on the criteria explained above, leaving 104 women. This multicenter study was conducted between January 2006 and June 2007.

Measures

The investigators used a picture of a human body, divided into grids, as described by Lindal.¹¹ Patients had to mark the grids where they experienced pain. The pain was defined as widespread if markings were both above and

below a horizontal line in the thoraco-lumbar region.¹² The line was not visible to the patients. Pain in the left and right sides of the body and above and below the waist was not always present. All patients completed the demographic data sheet and the self-report questionnaires including the Hospital Anxiety and Depression Scale (HADS), the Leisure Time Physical Activity Instrument (LTPAI), and the Physical Activity at Home-Work Instrument (PAHWI) at an arranged appointment. All patients agreed to answer the questionnaires carefully. At the same appointment, they were also evaluated in terms of pain and global fatigue using a Visual Analogue Scale (VAS).

The Visual Analogue Scale (VAS)

The scale was 10 cm long and anchored by the statements “no pain/fatigue” on the left and “the worst imaginable pain/fatigue” on the right. Self-evaluation of the pain and global fatigue was examined using VAS ratings from the previous month.¹³

The Hospital Anxiety and Depression Scale (HADS)

The HADS was used to measure symptoms of anxiety and depression. It is commonly used in people with physical illnesses as it omits the bodily symptoms of depression that may be caused by these illnesses (such as loss of appetite and sleep disturbance). This self-rated questionnaire consists of 14 items (7 for anxiety and 7 for depression). Each item is scored 0–3, with high scores representing high levels of symptoms of anxiety and/or depression. A score 11 or above on either scale indicates probable anxiety or depressive disorder. In view of the high correlation between anxiety and depression scores, a combined score (i.e. the total HADS score) was used for the main analyses.^{14,15} The Turkish version of the HADS was administered.¹⁶ It was selected for use in the present study since it is considered one of the best questionnaires for assessing depression and anxiety in patients.¹⁴

The Leisure Time Physical Activity Instrument (LTPAI)

Each subject was asked to remember the average number of hours spent during a week in activity at the given activity level over the previous

four weeks. The LTPAI includes three activity level categories: light, moderate, and vigorous. In the instrument a short description of each category was presented. The scale has the following steps: a) 0.5-1.5 hours a week, b) 2-4 hours a week, and c) more than 4 hours a week, which the respondent was asked to specify in hours. The mean value of the first two steps, being 1 and 3 hours, was used in the calculation of the total score. If no step was selected, the number of hours for the category was 0. The hours of the intensity categories were added together to produce the leisure time physical activity during a week.^{17,18}

The Physical Activity at Home or at Work Instrument (PAHWI)

The PAHWI includes three categories for work at home: light, moderate, and heavy activity, and four categories for employment: sedentary, light, moderate, and heavy activity. After a short description, the patient was asked to report the amount of time spent working in the given activity categories. The hours were added together to produce the total score for the PAHWI. The total score for the PAHWI was obtained based on the hours that the patient stated.¹⁷ For both LTPAI and PAHWI, two forward translations were done by independent translators from English to their native language which is Turkish.

Statistical analysis:

The data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS) (version 11.5), including descriptive statistics. The results were expressed as mean±standard deviation (SD). Factors related to pain and fatigue was studied using dorsal regression analyses. The significance level was set at 0.05.

RESULTS

The HADS-anxiety score was the only factor affecting pain intensity ($p=0.003$; $R^2=0.196$; Std. Error=0.082). On the other hand, global fatigue was affected by a moderate level of physical activity at home (carpet vacuuming, house cleaning weekly, bearing weight, carrying a baby etc.) ($p=0.027$; $R^2=0.306$; Std. Error=0.059),

physical activity at work (walking in the work place, going up and down stairs, bearing weight more than 3 kg etc.) ($p=0.008$; $R^2=0.214$; Std. Error=0.036), and HADS-anxiety score ($p= 0.020$; $R^2=0.129$; Std. Error=0.082). In other words, the HADS-anxiety score was the most important factor affecting pain and fatigue negatively among CWP patients.

Table 1. Socio-demographic data at study entry (N=104).

	X±SD
Age (years)	40.28±10.82
Height (m)	1.61±0.06
Body weight (kg)	66.65±11.30
Body mass index (kg/m ²)	25.78±4.65
Education duration (years)	10.64±5.73
Work hours in a week (N=44)	44.41±16.89
	n (%)
Employment status	
Working	44 (42.3)
Not working	47 (45.2)
Retired	13 (12.5)
Social security	
Yes	100 (96.2)
No	4 (3.8)
Living area	
Village	11 (10.6)
Town	15 (14.4)
City	44 (42.3)
Big city	34 (32.7)

Table 2. Factors affecting pain and global fatigue.

	R²	SE of E	p
Pain - HADS-A	0.196	0.082	0.003*
GF - MLPAaH	0.306	0.059	0.027*
GF - MLPAaW	0.214	0.036	0.008*
GF - HADS-A	0.129	0.082	0.020*

*p<0.05. SE of E: Standard error of the estimate. HADS-A: The Hospital Anxiety and Depression Scale, anxiety score. GF: Global Fatigue. MLPAaH: Moderate level of physical activity at home. MLPAaW: Moderate level of physical activity at work.

DISCUSSION

This is the first study which investigates the factors related to pain intensity and global fatigue in females with CWP using the new, suitable, validated, and reliable instruments, including PAHWI, LTPAI, HAD.^{14,16-18}

About 1% of the adult population develops a syndrome of chronic muscle pain characterized by long lasting pain, and an associated high frequency of fatigue.⁵ In addition, when studying pain results, gender should be accounted for as a potential confounder. Females often have lower thresholds, greater ability to discriminate, higher pain ratings, and less tolerance of noxious stimuli than males.⁴ Since CWP are more common in females, only female patients were included in this study.

The lack of specific disease mechanisms is reflected in the fact that no cure has been found for the disease, and the many interventions advocated in CWP target the more general characteristics of pain and disability.⁵ In addition, the number of investigations regarding a certain aspect of the chronic pain and fatigue is too small to give possible causes or treatment strategies for musculoskeletal pain complaints in CWP patients.

Fatigue and pain are major symptoms in CWP. Therefore, knowledge of the related factors may be important when planning the target of the treatment program. Moreover, according to a study by Ericsson et al., fatigue is a multidimensional concept and different aspects of fatigue should be measured separately.⁷

The results of our study showed that anxiety had negative effects on pain intensity and fatigue. In addition, fatigue was affected by a moderate level of physical activity at home and at work.

In the study by Le Goff, non-specific degenerative changes in the muscles were explained by prolonged reduced activity.¹⁹ At the same time, Fibromyalgia (FM) and CWP patients show post-exercise intolerance which acts as a deterrent to regular strength and endurance training. Post-exertion pain in FM patients is not always associated with reduced cardiovascular fitness. Recently, it has been possible to motivate FM patients to persist with heavy-resistance

training.²⁰ Our study results showed that moderate physical activity at home and at work had negative effects on global fatigue. Information on physical activity capacity might be very important when planning treatment programs for patients with CWP.

In a population-based study, 94% of patients diagnosed with Chronic Fatigue Syndrome (CFS) reported muscle aches and pain.^{4,20,21}

Just as with CWP, pain intensity has greater negative effects on self-reported activity and functional status than does fatigue.¹⁵ Consequently, physical therapists should aim to improve the physical capacity of CWP patients so as to reduce pain and global fatigue.

It has been suggested that aerobic exercise of low to moderate intensity, such as walking and pool exercise, can improve symptoms in CWP patients.⁸ In another study, by Mannerkorpi et al., it was also emphasized that correlations between performance-based tests and activity limitations tended to be higher than those between performance and pain.²²

Physiological pain-processing mechanisms together with multiple psychological and environmental factors are thought to interact in the development and maintenance of FM.⁸

After all there are mounting data supporting an overlap between CWP and psychiatric conditions, including depression, panic disorders, and anxiety.²³ The prevalence of anxiety disorder in the general population was found to be 7% by Williams. Anxiety disorder is being increasingly identified as a co-morbid psychiatric concern in patients with chronic pain.²⁴ Although depression seemed not to be related to pain in CFS patients,⁴ mild psychiatric disturbances, e.g., depression and anxiety, were described in about one third of FM patients. This may increase the severity of the symptoms.²⁵ However, we found no relation between depressive symptoms and pain or fatigue in the present study.

The results obtained from this study highlight the clinical importance of chronic pain and fatigue in CWP. Few studies addressing the factors that affect pain and fatigue in CWP are currently

available. Recently, several hypotheses have been proposed, but they have been not proved.

We found a significant relation between anxiety and pain and fatigue in patients with CWP. In addition, physical activity at home and work has negative effects on global fatigue.

The results presented here tend to support the view that a considerable proportion of anxiety in CWP patients has negative effects. Thus, early assessment of anxiety symptoms might be crucial in evaluating CWP patients when planning physical therapy and rehabilitation programs to improve their symptoms. Therefore, the HADS, LTPAI and PAHWI, used here, should be a part of the routine assessment of CWP patients in clinical practice and in research. In future, attention should be paid to how anxiety and physical activity status affect pain and fatigue in these patients.

ACKNOWLEDGEMENT

The authors would like to thank Prof. Kaisa Mannerkorpi from Sahlgrenska Academy Göteborg University, Sweden for valuable contributions and for supporting this study. The authors also thank Dr. Beyza Akdag from Pamukkale University for her valuable contributions during statistical analyse process of the data

REFERENCES

1. Wolfe F, Smythe HA, Yunus MB, et al. The American College of Rheumatology 1990 criteria for the classification of fibromyalgia. *Arthritis Rheum.* 1990;33:160-172.
2. Andersson M, Bagby JR, Dyrehag L, et al. Effects of staphylococcus toxoid vaccine on pain and fatigue in patients with fibromyalgia/chronic fatigue syndrome. *Eur J Pain.* 1998;2:133-142.
3. Morriss RK, Ahmed M, Wearden AJ, et al. The role of depression in pain, psychophysiological syndromes and medically unexplained symptoms associated with chronic fatigue syndrome. *J Affect Disord.* 2007;55:143-148.
4. Meeus M, Nijs J, Meirleir KD. Chronic musculoskeletal pain in patients with the chronic fatigue syndrome: a systematic review. *Eur J Pain.* 2007;11:377-386.
5. Bliddal H, Danneskiold-Samsøe B. Chronic widespread pain in the spectrum of rheumatological

- diseases. *Best Pract Res Clin Rheumatol.* 2007;21:391-402.
6. Nijs J, Cloostermans B, McGregor N, et al. Construct validity and internal consistency of the chronic fatigue syndrome activities and participation questionnaire (CFS-APQ), *Physioth Theory Pract* 2004;20:31-40.
 7. Ericsson A, Mannerkorpi K. Assessment of fatigue in patients with fibromyalgia and chronic widespread pain. Reliability and validity of the Swedish version of the MFI-20. *Disabil Rehabil.* 2007;29:1665-1670.
 8. Mannerkorpi K, Henriksson C. Non-pharmacological treatment of chronic widespread musculoskeletal pain. *Best Pract Res Clin Rheumatol* 2007;21:513-534.
 9. Walker EA, Katon WJ, Keegan D, et al. Predictors of physician frustration in the care of patients with rheumatological complaints. *Gen Hosp Psychiatry.* 1997;19:315-323.
 10. Bieber C, Müller KG, Blumenstiel K, et al. Long-term effects of a shared decision-making intervention on physician-patient interaction and outcome in fibromyalgia: A qualitative and quantitative 1 year follow-up of a randomized controlled trial. *Patient Educ Couns.* 2006;63:357-366.
 11. Lëndal E, Bergmann S, Thorlacius S, et al. The localization of pain in chronic fatigue syndrome on a pain drawing according to grid areas. *Percept Mot Skills.* 1996;83:508-510.
 12. Skouen JS, Grasdøl A, Haldorsen EM. Return to work after comparing outpatient multidisciplinary treatment programs versus treatment in general practice for patients with chronic widespread pain. *Eur J Pain.* 2006;10:145-152.
 13. Breivik H, Collett B, Ventafridda V, et al. Survey of chronic pain in Europe: Prevalence, impact on daily life, and treatment. *Eur J Pain.* 2006;10:287-333.
 14. Garcia-Campayo J, Pascual A, Alda M, et al. Coping with fibromyalgia: Usefulness of the Chronic Pain Coping Inventory-42. *Pain.* 2007;132:68-76.
 15. Keeley P, Creed F, Tomenson B, et al. Psychosocial predictors of health-related quality of life and health service utilisation in people with chronic low back pain. *Pain.* 2008;135:142-150.
 16. Aydemir Ö, Güvenir T, Küey L, Kültür S. Hastane Anksiyete ve Depresyon Ölçeği Türkçe Formunun Geçerlilik ve Güvenirliliği. *Türk Psikiyatri Dergisi.* 1997;8:280-287.
 17. Mannerkorpi K, Hernelid C. Leisure Time Physical Activity Instrument and physical activity at Home and Work. Developments, face validity, construct validity and test-retest reliability for subjects with fibromyalgia. *Disabil Rehabil.* 2005;27:695-701.
 18. Mannerkorpi K, Rivano-Fischer M, Ericsson A, et al. Experience of physical activity in patients with fibromyalgia and chronic widespread pain. *Disabil Rehabil.* 2008;30:213-221.
 19. Le Goff P. Is fibromyalgia a muscle disorder?. *Joint Bone Spine* 2006;73:239-242.
 20. Mengshoel AM, Vøllestad NK, Førre O. Pain and fatigue induced by exercise in fibromyalgia patients and sedentary healthy subjects. *Clin Exp Rheumatol.* 1995;13: 477-482.
 21. Nishikai M, Tomomatsu S, Hankins RW et al. Autoantibodies to a 68/48 kDa protein in chronic fatigue syndrome and primary fibromyalgia: a possible marker for hypersomnia and cognitive disorders. *Rheumatology (Oxford).* 2001;40:806-810.
 22. Mannerkorpi K, Svantesson U, Broberg C. Relationships between performance-based tests and patients' ratings of activity limitations, self-efficacy, and pain in fibromyalgia. *Arch Phys Med Rehabil.* 2006;87:259-64.
 23. Amital D, Fostick L, Polliack ML, et al. Posttraumatic stress disorder, tenderness, and fibromyalgia syndrome: are they different entities?. *J Psychosom Res.* 2006;61:663-669.
 24. Williams DA. Psychological and behavioural therapies in fibromyalgia and related syndromes. *Best Pract Res Clin Rheumatol* 2003;17:649-665.
 25. Krag NJ, Nørregaard J, Larsen JK, et al. A blinded, controlled evaluation of anxiety and depressive symptoms in patients with fibromyalgia, as measured by standardized psychometric interview scales. *Acta Psychiatrica Scandinavica.* 1994;89:370-375.