H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
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Özgün araştırma

Orta Yaşlı Kadınlarda Spinal Ağrının Jinekolojik ve Obstetrik Belirleyicileri

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Öz

Amaç: Yorgunluk, spinal ağrı ve obstetrik ve jinekolojik öykü arasındaki bağlantı net değildir. Bu çalışmanın amacı, orta yaşlı kadınlarda spinal ağrı prevalansını ve spinal ağrının sosyodemografik, obstetrik ve jinekolojik belirleyicilerini belirlemektir.
Gereç ve Yöntem: Bu kesitsel çalışmaya 705 orta yaşlı kadın (ortalama yaş: 47.55 ± 8.0 yıl) katılmıştır. Katılımcıların demografik verileri, yaşam tarzı alışkanlıkları, jinekolojik ve obstetrik öyküleri kaydedilmiştir. Katılımcıların yorgunluk ve enerji düzeyleri, Yorgunluk için Görsel Analog Skala (GAS-Y) ile değerlendirilmiştir.
Bulgular: Spinal ağrı prevalansı %71,8 idi. Demografik faktörler ve yaşam tarzı alışkanlıkları boyun ağrısı ile ilişkili değildi. İleri yaş ve yüksek Beden Kütle İndeksi (BKİ), üst sırt ağrısı ($p<0.01$), alt sırt ağrısı ($p<0.001$) ve çoklu omurilik ağrısı ($p<0.01$) sıklığı ile ilişkili bulunmuştur. Memur ($p<0.01$) veya işçi ($p<0.05$) olmak üst sırt ağrısı için koruyucu etkiye sahiptir. Menopoz döneminde olmak artan oranda üst sırt ($p<0.1$), alt sırt ($p<0.001$) ve çoklu bel ağrısı ($p<0.01$) ile ilişkiliydi. Artmış Gebelik sayısı ($p<0.001$), canlı doğum sayısı ($p<0.001$) ve yorgunluk düzeyi ($p<0.001$) artan oranda bel ağrısı ile ilişkiliydi. Yorgunluk düzeyinin artması tüm spinal ağrı tiplerinin artışı ile ilişkiliydi ($p<0.001$).
Sonuç: İleri yaş, yüksek BKİ, menopozal durum, artmış gebelik sayısı ve yorgunluk düzeyi spinal ağrının belirleyicileri olabilir. Orta yaş kadınlarda spinal ağrı değerlendirilirken bu risk faktörleri de göz önünde bulundurulmalıdır.

Anahtar kelimeler: *kesitsel çalışmalar, menopoz, orta yaş, ağrı*

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H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

Original Research

Gynecologic and Obstetric Determinants of Spinal Pain in Middle-aged women

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Abstract

Objectives: The link between fatigue, spinal pain, and obstetric and gynecologic history is unclear. The aim of this study was to determine spinal pain prevalence and sociodemographic, obstetric and gynecological determinants of spinal pain in middle-aged women.
Materials and Methods: Seven hundred and five middle-aged women (mean age: 47.55 ± 8.0) participated in this cross-sectional study. The demographic data, lifestyle habits, and gynecologic and obstetric history of the participants were recorded. The fatigue and energy levels of the participants were assessed with Visual Analogue Scale for Fatigue Scale (VAS-F).
Results: Spinal pain prevalence was 71.8%. Sociodemographic factors and lifestyle habits were not associated with neck pain. Advanced age and higher body mass ındex (BMI) were associated with a higher rate of upper back pain ($p<0.01$), lower back pain ($p<0.001$) and multiple spinal pain ($p<0.01$). Being a civil servant ($p<0.01$) or worker ($p<0.05$) has a protective effect on upper back pain. Being in post-menopausal status was associated a higher rate of upper back ($p<0.1$), lower back ($p<0.001$) and multiple spinal pain ($p<0.01$). An increased number of pregnancies ($p<0.001$), and multiparity ($p<0.001$) were associated with a higher rate of upper back pain. Increased fatigue level was associated with a higher rate of all types of spinal pain ($p<0.001$).
Conclusion: Advanced age and higher BMI, post-menopausal status, multiparity and fatigue level might be the determinants of spinal pain. These risk factors should also be considered when evaluating spinal pain in middle-aged women.

Keywords: cross-sectional studies, menopause, middle aged, pain

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H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

Introduction

Spinal pain is one of the most frequently reported musculoskeletal disorders (Manchikanti et al., 2009). Chronic neck, upper back, and lower back pain are components of spinal pain. Any spinal structure innervated by muscles, synovial joints, intervertebral discs, dura mater, and ligaments can cause spinal pain (Peng et al., 2019). The prevalence of chronic neck pain, upper back pain and low-back pain were reported that they are range from 14.5% to 51% (Azevedo et al., 2012; Huisstede et al., 2008), 10% to 20% (Azevedo et al., 2012) and 15% to 45% (Manchikanti et al., 2009), respectively.

Factors that can increase the risk of chronic spinal pain include: Female gender, advanced age, low education level, low socioeconomic status, anxiety and depression (Jiménez-Sánchez et al., 2012; Meucci et al., 2013). It has been found that after menopause, low back pain prevalence is higher among women than in young and adults age (Wáng et al., 2016). Results of a 9-year follow-up study conducted on middle-aged women showed that obesity, depressive symptoms, low education level and low physical activity level increase the risk of low back pain (Brady et al., 2018). Postmenopausal women with poor posture, decreased spinal mobility, and decreased trunk strength experience more upper back pain (Gong et al., 2019; Spencer et al., 2019). It was observed that the fatigue levels of the participants with neck pain and low back pain were higher than the healthy controls. The reason was found to be related to neuropathic pain, female gender, and psychological status (Fishbain et al., 2014). Fatigue prevalence is 63% in middle-aged women and post-menopausal status and gynecological history are found to be associated with fatigue (Jabeen et al., 2018). The link between the triad of fatigue, spinal pain, and obstetric and gynecologic history is unclear.

Although there are studies examining all these factors separately in middle-aged women, no study examining all these risk factors together in the same population has been found. The aim of this study was to determine spinal pain prevalence and sociodemographic, obstetric and gynecological determinants of spinal pain in middle-aged women.

Materials and Methods

Study Design

This cross-sectional study was carried out in Denizli between February and July 2021. In order to ensure the accessibility of the study population, 2 of the 31 Family Health Districts (FHD) (Adalet FHD and Merkezefendi FHD) with the highest density were selected. The study was performed in accordance with the principles of the Declaration of Helsinki and approved

H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

by the Pamukkale University Clinical Research and Ethics Committee (approval date: 05.01.2021, approval number: 01).

Participants

The study inclusion criteria were as follows: age between 35-65 years, being female, and being a resident of the selected FHD area. The study exclusion criteria were as follows: having a history of chronic fatigue syndrome, having a history of spinal pain that may cause functional activity loss, having undergone spinal surgery, having inflammatory and tumoral complaints in the spine, significant deformity in the spine (such as scoliosis), and being pregnant.

A total of 976 participants were screened. 271 participants were excluded because they did not meet the inclusion criteria (n=110) and did not want to participate in the study (n=161). Finally, 705 participants attended the study.

Outcome Measures

The demographic data (age, body mass index, marital status, educational status, occupation), lifestyle habits (smoking habit, alcohol consumption, exercise habits), gynecologic history (menarche age, duration of menstrual flow and frequency of menstrual periods, post-menopausal status, post-menopausal age, type of menopause), and obstetric history (parity, maternal age, number of pregnancies, number of abortion, mode of delivery) of the participants were recorded.

Spinal pain prevalence was recorded by questioning whether there was pain in any spinal region in the last 7 days. The patient was asked to localise the pain on the body map. In addition, the localisation of the painful spinal region was recorded as neck, upper back, lower back and multiple areas. Multiple pain was defined as having pain in more than one spine region.

After the priori assessment, fatigue and energy levels of the participants were assessed with Visual Analogue Scale for Fatigue Scale (VAS-F). VAS-F consists of 18 items related to the subjective experience of fatigue. A visual analogue line represents fatigue level from “not at all tired” to “extremely tired”. The participants are asked to mark the point on the visual analogue line of how they currently feel. VAS-F consist of two subscales: fatigue and energy. The higher score of the fatigue and the lower score of the energy subscales represent a higher fatigue level. The maximum score is 13 for the fatigue subscale and 5 the for energy subscale (Yurtsever, 2003).

Statistical Analysis

H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

Statistical analyses were performed with IBM SPSS Statistics 25 software. Continuous variables were expressed as the mean ± standart deviation and median (minimum-maximum values) and categorical variable values were presented as absolute frequency and percentages. The conformity of continuous variables with normal distribution was evaluated using the Shapiro-Wilk test. Logistic regression analysis is the most commonly used method in the literature when risk factor analysis is aimed. With the support of the high number of subjects, in line with our aims, sociodemographic, obstetric and gynecological determinants of spinal pain were analysed with binary logistic regression analysis. Statistical significance was set at $p \leq 0.05$.

Results

A total of 705 participants (mean age: 47.55 ± 8.0 years) were initially interviewed in this cross-sectional study, 506 (71.8%) of them reported spinal pain in the last week prior to the interview date, being included in the final analysis. Neck pain, upper back pain, lower back pain and multiple pain prevalence were 20.9% (n=106), 8.3% (n=42), 37.2% (n=188), 33.6% (n=170), respectively (Figure 1). Most of the participants were married (82.1%), educated ≤ 5 years (62.3%), not smoking (77.4%) and not having an alcohol habit (96.3%). More than half (65.5%) of the participants were housewives, and 245 (34.8%) of the participants had exercise habits (Table 1). The gynecologic and obstetric characteristics of the participants with spinal pain were shown in Table 2.

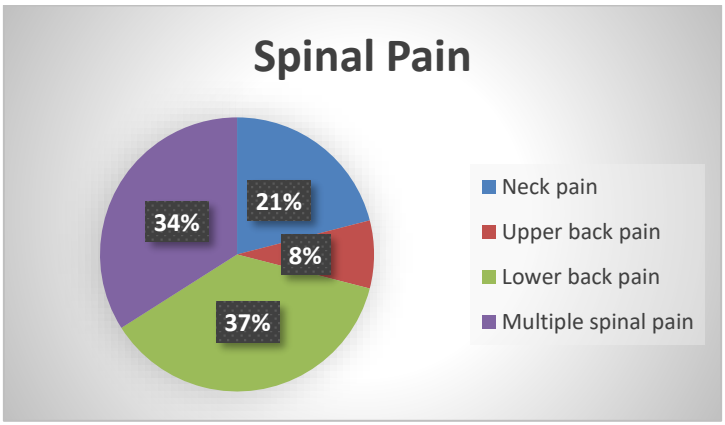

Figure 1: Proportion of pain according to the spinal region

H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

Table 1: Sociodemographic characteristics and life-style habits of the participants

Characteristics	**Mean±SD**	**Median (Min-Max)**
Age (years)	47.55 ± 8.00	47 (35 - 65)
BMI (kg/m^2)	27.08 ± 4.29	26.67 (17.78-44.44)
Marital status	**n**	**%**
Married	578	82.1
Single	40	5.7
Divorced	86	12.2
Educational level		
≤ 5 years	439	62.3
6-11 years	112	15.9
>11 years	154	21.8
Occupation		
Housewife	448	63.5
Civil servant	143	20.3
Worker	73	10.4
Self-employment	41	5.8
Smoking status		
Yes	159	22.6
No	544	77.4
Alcohol consumption status		
Yes	45	6.4
No	658	93.6
Exercise habits		
Yes	245	34.8
No	459	65.2

BMI: Body Mass Index; SD: Standart Deviation; Min-Max: Minimum-Maximum

Table 2: Gynecologic, obstetric characteristics, fatique and energy level of the 506 participants with spinal pain.

Characteristics	**Mean±SD / n**	**Median (Min-Max) / %**
Gynecologic		
Menarche age (years)	13.02±1.42	13 (8-18)
Post-menopausal status		
Yes	277	54.7
No	229	45.3
Menopausal age	46.32±4.75	47 (26-56)
Type of menopause		
Natural menopause	195	85.2
Surgical menopause	34	14.8
Obstetric		
Parity		
Mono/primi-parous	468	92.5
Nulliparous	38	7.5
Maternal age	21.59±3.78	21 (14-40)
Multiparous	2.77±1.36	2 (1-9)
Number of abortion	1.55±1.09	1 (0-9)
Mode of delivery		
Cesarean section	68	14.4
Vaginal birth	400	85.6
Fatigue level	4.23 ± 1.83	4.08 (0-10)
Energy level	5.17 ± 2.01	5.2 (0-10)

SD: Standart Deviation; Min-Max: Minimum-Maximum

H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

Sociodemographic Factors and Lifestyle Habits Influencing Spinal Pain

Taken into account the main results obtained with the linear regression analysis, the sociodemographic factors were not associated with a higher prevalence of neck pain. Factors associated with a higher prevalence of upper back pain were: advanced age (p<0.01, OR: 1.031), and higher BMI (p<0.01, OR: 1.050). Being a civil servant (p<0.01, OR: 0.551) or worker (p<0.05, OR: 0.566) compared to a housewife has a protective effect on upper back pain. Factors associated with a higher prevalence of lower back pain were: advanced age (p<0.001, OR: 1.043), and higher BMI (p<0.001, OR: 1.102). Factors associated with a higher prevalence of multiple spinal pain were: advanced age (p<0.01, OR: 1.03, 95% CI: 1.008-1.052), and higher BMI (p<0.01, OR:1.064) (Table 3).

Table 3: Sociodemographic factors and lifestyle habits influencing spinal pain

Factors	**Neck Pain**				**Upper Back Pain**				**Lower Back pain**				**Multiple spinal pain**			
	p	**OR**	**95% C.I.for O.R**		**p**	**OR**	**95% C.I.for O.R**		**p**	**OR**	**95% C.I.for O.R**		**p**	**OR**	**95% C.I.for O.R**	
			Lower	**Upper**			**Lower**	**Upper**			**Lower**	**Upper**			**Lower**	**Upper**
Age (years)	0.614	1.005	0.986	1.025	**0.006**	1.031	1.009	1.053	**<0.001**	1.043	1.023	1.063	**0.007**	1.03	1.008	1.052
BMI (kg/m^2)	0.377	1.016	0.980	1.054	**0.017**	1.050	1.009	1.093	**<0.001**	1.102	1.063	1.144	**0.002**	1.064	1.023	1.107
Educational level *(≤ 5 years)*[a]																
6-11 years	0.855	0.96	0.62	1.487	0.664	1.111	0.69	1.789	0.785	0.944	0.623	1.43	0.677	1.104	0.693	1.759
>11 years	0.922	0.981	0.667	1.443	0.643	0.901	0.581	1.399	0.601	0.932	0.563	1.079	0.119	0.698	0.444	1.097
Occupation *(Housewife)*[a]																
Civil servant	0.534	0.881	0.591	1.313	**0.003**	0.551	0.374	0.813	0.754	1.072	0.694	1.658	0.352	0.811	0.521	1.261
Worker	0.638	0.882	0.521	1.491	**0.029**	0.566	0.34	0.943	0.533	0.824	0.449	1.514	0.058	0.532	0.277	1.022
Self-employment	0.608	0.836	0.421	1.659	0.393	0.755	0.397	1.438	0.942	1.028	0.488	2.166	0.3	0.655	0.294	1.458
Smoking habits	0.667	0.921	0.634	1.339	0.390	1.195	0.797	1.792	0.183	0.784	0.548	1.122	0.979	0.994	0.66	1.499
Alcohol habits	0.466	0.780	0.400	1.520	0.585	0.810	0.381	1.723	0.170	0.642	0.341	1.209	0.459	0.753	0.355	1.597
Exercise habits	0.076	1.340	0.970	1.853	0.331	0.832	0.574	1.205	0.101	0.769	0.562	1.053	0.23	0.799	0.553	1.153

OR: Odds Ratio; CI: confidence Interval; BMI: Body Mass Index

H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

Gynecologic Factors, Obstetric Factors and Fatigue Level Influencing Spinal Pain

Taken into account the main results obtained with the linear regression analysis, a factor associated with a higher prevalence of neck pain was: increased fatigue level (p<0.001, OR: 1.012). Factors associated with a higher prevalence of upper back pain were: being post-menopausal status (p<0.001, OR: 2.004), increased number of pregnancies (p<0.001, OR: 1.248), multiparous (p<0.001, OR: 1.319), increased fatigue level (p<0.001, OR: 1.02). Increased maternal age (p<0.01, OR: 0.931), and decreased energy level (p<0.001, OR: 0.963) have protective effects for upper back pain. Factors associated with a higher prevalence of lower back pain were: being post-menopausal status (p<0.01, OR: 1.607), and increased fatigue level (p<0.001, OR: 1.017). Factors associated with a higher prevalence of multiple spinal pain were: being post-menopausal status (p<0.01, OR: 1.667), and increased fatigue level (p<0.001, OR: 1.018). Decreased energy level (p<0.01, OR: 0.977) has a protective effect for multiple spinal pain (Table 4).

Table 4: Gynecologic, obstetric factors, fatique and energy levels influencing spinal pain

Factors	**Neck Pain**				**Upper back pain**				**Lower back pain**				**Multiple spinal pain**			
	p	**OR**	**95% C.I.for O.R**		**p**	**OR**	**95% C.I.for O.R**		**p**	**OR**	**95% C.I.for O.R**		**p**	**OR**	**95% C.I.for O.R**	
Gynecologic factors																
Menarche age (years)	0.207	1.07	0.963	1.19	0.484	1.037	0.937	1.147	0.413	0.952	0.846	1.071	0.3	1.063	0.947	1.195
Post-menopausal status																
Reference:Not being menopause	0.22	1.217	0.889	1.667	**<0.001**	2.004	1.478	2.718	**0.008**	1.607	1.134	2.278	**0.004**	1.667	1.18	2.353
Menopausal age	0.171	1.037	0.984	1.092	0.557	1.015	0.966	1.066	0.192	1.038	0.981	1.098	0.103	1.048	0.991	1.108
Type of menopause	0.213	0.624	0.297	1.31	0.082	1.903	0.922	3.924	0.385	0.704	0.319	1.555	0.493	0.765	0.355	1.647
Obstetric factors																
Parity	0.437	1.25	0.712	2.192	0.112	1.545	0.904	2.64	0.76	0.911	0.502	1.653	0.436	1.287	0.682	2.431
Maternal age	0.297	0.977	0.934	1.021	**0.001**	0.931	0.891	0.973	0.664	0.989	0.941	1.039	0.029	0.944	0.897	0.994
Multiparous	0.298	1.066	0.945	1.203	**<0.001**	1.319	1.162	1.496	0.179	1.094	0.96	1.248	0.013	1.176	1.035	1.336
Number of abortion	0.371	1.118	0.876	1.428	0.205	0.85	0.661	1.093	0.052	1.299	0.997	1.693	0.349	1.13	0.875	1.459
Mode of delivery																
Cesarean section	0.927	1.021	0.653	1.596	0.145	1.379	0.896	2.123	0.995	1.002	0.608	1.65	0.718	1.096	0.666	1.803
Vaginal birth	0.962	0.943	0.083	10.766	0.999	0	0	0	0.999	0	0	0	0.999	0	0	0
Fatigue level	**<0.001**	1.012	1.006	1.019	**<0.001**	1.02	1.013	1.026	**<0.001**	1.017	1.01	1.024	**<0.001**	1.018	1.011	1.025
Energy level	0.135	0.989	0.974	1.004	**<0.001**	0.963	0.949	0.977	0.071	0.985	0.969	1.001	**0.005**	0.977	0.961	0.993

OR: Odds Ratio; CI: confidence Interval

H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

Discussion

This study determined the prevalence of spinal pain in middle-aged women and revealed the sociodemographic, obstetric and gynecological determinants of the spinal pain. The frequency of spinal pain was 71.8%, and neck pain, upper back pain, lower back pain and multiple spinal pain frequencies were 20.9%, 8.3%, 37.2% and 33.6%, respectively. Age and BMI for upper back, lower back and multiple spinal pain were identified as sociodemographic determinants of spinal pain. Post-menopausal status for low back pain and multiple spinal pain, parity and multiparous for upper back pain were identified as obstetric and gynecological determinants. Fatigue level was the determinant of pain in all spinal regions.

In order to determine the frequency of spinal pain, the current study questioned whether there was pain in any spinal region in the last 7 days. According to current study results, the frequency of spinal pain was 71.8%, and separate frequencies of neck, upper back, lower back and multiple spinal pain were 20.9%, 8.3%, 37.2%, and 33.6%, respectively. The chronic spinal pain prevalence was 22% in Brazil and the separate prevalence estimates for neck pain, upper back pain and lower back pain were 5.7, 6.8 and 18.4% (Depintor et al., 2016). The variance in spinal pain prevalence may be due to differences between study groups (such as age and gender) or different definitions of spinal pain (Wáng et al., 2016). Besides, there may also be cultural differences in the pain perception or reporting (Zajacova et al., 2022). Some ethnic groups may prefer to endure the pain rather than report it. The biopsychosocial model of chronic pain reported that biological, psychological and sociocultural factors are related to gender differences in pain perception (Bartley & Fillingim, 2013). We only examined the middle-aged women, therefore, we obtained higher pain prevalence than in the literature.

We concluded that age and BMI have an increasing effect on the prevalence of upper back pain, low back pain and multiple spinal pain. Neck pain was not affected by age and BMI in the current study. We saw in the literature that the neck pain prevalence peaks in middle age and then decreases (Hoy et al., 2010; Safiri et al., 2017). In the current study, the participants were middle-aged and the prevalence was already the highest level. So it is not expected to increase with ageing. Also, we concluded that BMI has no effect on neck pain prevalence. Neck pain may be less affected by obesity than other non-weight-bearing joints (Son et al., 2013). Because of this, obesity may not be the determinant for neck pain. It has been shown that increased BMI is a predictor of low back pain in middle-aged women (Brady et al., 2017). In contrast, obesity and age have no direct influence on low back pain, but they could prolong healing (Ibrahimi-Kaçuri et al., 2015). Due to the contradiction in the literature, there is a need for a long-term follow-up study examining the effects of increasing age and BMI on spinal pain.

H.Ü. Sağlık Bilimleri Fakültesi Dergisi
Cilt:10, Sayı:3, 2023
Doi:10.21020/husbfd.1250169

We found that being in post-menopausal status has an increasing effect on the prevalence of low back pain and multiple spinal pain. It has been reported that musculoskeletal pain seen in perimenopausal women may be due to estrogen deficiency (Dedicação, 2017). The most important predictive parameter of musculoskeletal pain in postmenopausal women was found to be climacteric symptoms (Lee, 2019). We did not question climacteric symptoms as a predictor of spinal pain. Many study results approved increased spinal pain during pregnancy, but few studies have examined the multiparity and maternal age as a risk factors for spinal pain. We concluded that the multiparity has an increasing effect on the prevalence of upper back pain. We think that one of the reasons is breastfeeding. The higher incidence of osteoporosis as a result of prolonged breastfeeding experience (Malik et al., 2022) and the incorrect breastfeeding position (Lee, 2019) may have caused more upper back pain.

It has been reported that fatigue, which is frequently seen in patients with chronic pain, may be associated with pain. It has been shown that patients with chronic low back pain and chronic neck pain are more fatigued than healthy controls. More fatigue level attributes to neuropathic pain, female gender, and psychiatric comorbidities (depression and decreased self-efficacy (Fishbain et al, 2014; Salvetti et al., 2013). The current study results showed that the increase in fatigue level has an increasing effect on the frequency of pain in all spinal regions. We think that this result may be related to the female gender or chronic pain.

Limitations

The current study's inclusion criteria included middle-aged women of both post-menopausal and non-menopausal status. For this reason, participants who were in the menopausal period and had climacteric symptoms were also included in the study. However, the presence or severity of climacteric symptoms was not questioned. Evaluation of climacteric symptoms severity could have helped us better interpret the interaction effects. We think that the effect of the severity of climacteric symptoms on pain prevalence should be investigated in future studies. However, the current study is the first to investigate the obstetric and gynecologic determinants of musculoskeletal pain in all spinal regions separately.

In conclusion, this study showed that the frequency of spinal pain in middle-aged women was high in Turkey. Being in post-menopausal status, the number of parous, and fatigue severity may be determinative in explaining the variation in spinal pain prevalence rate. Turkish healthcare policymakers should develop the necessary strategies to decrease spinal pain prevalence in middle-aged women. A prospectively planned cohort study will further elucidate the temporal nature of the relationship between predictive factors and high spinal pain prevalence.

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Conflict of Interest

The authors declare that there is no conflict of interest between them.

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