

Investigation of Pelvic Floor Function in Women with and without Primary Dysmenorrhea

Primer Dismenoreli ve Dismenore Olmayan Kadınlarda Pelvik Taban Fonksiyonunun İncelenmesi

Özden BASKAN^{a*}, Muammer ÇORUM^b, Emine Nur DEMİRCAN^c, Nesrin YAĞCI^d

^a Assistant Professor, Department of Physical Therapy and Rehabilitation, Faculty of Health Sciences, İstanbul Rumeli University, İstanbul, Türkiye. [ROR](#)

^a Doktor Öğretim Üyesi, Fizyoterapi ve Rehabilitasyon Bölümü, Sağlık Bilimleri Fakültesi, İstanbul Rumeli Üniversitesi, İstanbul, Türkiye. [ROR](#)

^b Lecturer, Department of Therapy and Rehabilitation, Seydişehir Vocational School of Health Services, Necmettin Erbakan, Konya, Türkiye. [ROR](#)

^b Öğretim Görevlisi, Terapi ve Rehabilitasyon Bölümü, Seydişehir Sağlık Hizmetleri Meslek Yüksekokulu, Necmettin Erbakan Üniversitesi, Konya, Türkiye. [ROR](#)

^c Assistant Professor, Department of Physical Therapy and Rehabilitation, Faculty of Health Sciences, İstanbul Kent University, İstanbul, Türkiye. [ROR](#)

^c Doktor Öğretim Üyesi, Fizyoterapi ve Rehabilitasyon Bölümü, Sağlık Bilimleri Fakültesi, İstanbul Kent Üniversitesi, İstanbul, Türkiye. [ROR](#)

^d Professor Doctor, Faculty of Physical Therapy and Rehabilitation, Pamukkale University, Denizli, Türkiye. [ROR](#)

^d Profesör Doktor, Fizyoterapi ve Rehabilitasyon Fakültesi, Pamukkale Üniversitesi, Denizli, Türkiye. [ROR](#)

* Corresponding Author / İletişimden Sorumlu Yazar, E-mail: ozdenbaskan@gmail.com.tr

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ABSTRACT

Introduction: This study investigated the relationship between primary dysmenorrhea and pelvic floor function.

Methods: A total of 145 women aged 18 to 35 participated in this study. Participants provided demographic information via questionnaire. Pain intensity was measured using the Visual Analogue Scale. Pelvic floor function was assessed using the Pelvic Floor Distress Inventory-20, and the impact of pelvic floor problems on daily life was evaluated using the Pelvic Floor Impact Questionnaire-7.

Results: The mean age of the women was 23.79±0.348 years, with 71.7% (n=104) experiencing primary dysmenorrhea. The mean pain intensity score was 6.23 ± 1.93. The mean Pelvic Floor Distress Inventory-20 score was 55.47 ± 47.13, and the mean Pelvic Floor Impact Questionnaire-7 score was 12.28 ± 36.28. Visual Analogue Scale and Pelvic Floor Distress Inventory-20 scores were significantly higher in the primary dysmenorrhea group compared to the healthy control group (p < 0.05). Correlations were found between Visual Analogue Scale scores and both Pelvic Floor Distress Inventory-20 and Pelvic Floor Impact Questionnaire-7 scores. A weak positive correlation was observed between Pelvic Floor Distress Inventory-20 and Pelvic Floor Impact Questionnaire-7 total scores (p < 0.05). Comparison of Pelvic Floor Distress Inventory-20 and Pelvic Floor Impact Questionnaire-7 results between women with and without primary dysmenorrhea revealed statistically significant differences in prolapse distress scores (p < 0.05) and total pelvic floor distress scores (p < 0.05).

Conclusion: Primary dysmenorrhea appears to negatively impact prolapse, colorectal-anal discomfort, and overall pelvic floor function. However, the study did not find a significant impact of pelvic floor problems related to primary dysmenorrhea on overall quality of life as measured by Pelvic Floor Impact Questionnaire-7.

Keywords: Dysmenorrhea, Pelvic floor, Pain, Function

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ÖZET

Giriş: Çalışmanın amacı primer dismenore ile pelvik taban fonksiyonu arasındaki ilişkiyi araştırmaktır.

Yöntem: Çalışmaya yaşları 18 ile 35 arasında değişen yüz kırk beş kadın katıldı. Katılımcılara demografik bilgilerini belirlemek için sorular soruldu. Ağrı şiddetini belirlemek için Görsel Analog Skala, pelvik taban fonksiyonunu belirlemek için Pelvik Taban Sıkıntı Envanteri-20 ve pelvik taban sorunlarının kişinin yaşamı üzerindeki etkisini değerlendirmek için Pelvik Taban Etki Anketi-7 kullanıldı.

Bulgular: Katılımcıların yaş ortalaması 23.79±0.348 yıldır ve %71.7'sinde (n=104) primer dismenore vardı. Katılımcıların ortalama ağrı şiddeti 6.23±1.93 idi. Pelvik Taban Sıkıntı Envanteri-20 puan ortalaması 55.47±47.13 iken, Pelvik Taban Etki Anketi-7 puan ortalaması 12.28±36.28 idi. Primer dismenoreli olgularda sağlıklı gruba göre Görsel Analog Skala, Pelvik Taban Sıkıntı Envanteri-20 puanları anlamlı derecede yüksek bulundu (p<0.05). Katılımcıların Görsel Analog Skala ile Pelvik Taban Sıkıntı Envanteri-20 ve Pelvik Taban Etki Anketi-7 puanları arasında korelasyon bulunmuştur. Katılımcıların Pelvik Taban Sıkıntı Envanteri-20 ve Pelvik Taban Etki Anketi-7 toplam puanları arasında pozitif yönde düşük bir korelasyon bulunmuştur (p<0.05). Primer dismenoreli olan ve olmayan katılımcıların Pelvik Taban Sıkıntı Envanteri-20 ve Pelvik Taban Etki Anketi-7 sonuçları karşılaştırıldığında, prolapsus sıkıntısı puanlarında (p<0.05) ve pelvik taban sıkıntısı toplam puanlarında (p<0.05) istatistiksel olarak anlamlı bir fark bulundu.

Sonuç: Primer dismenoreli olan kadınlarda prolapsus, kolorektal anal sıkıntı ve total pelvik taban fonksiyonunun etkilendiği sonucuna varılabilir. Ancak primer dismenore nedeniyle gelişen pelvik taban problemlerinin kişinin yaşamı üzerine etkisi bulunmadı.

Anahtar Kelimeler: Dismenore, Pelvik taban, Ağrı, Fonksiyon

1. Introduction

The term dysmenorrhea is defined as painful menstrual cramps (Situmorang et al, 2024). The prevalence of dysmenorrhea, which is the most common gynaecological problem in women of all ages, varies between 16.8% and 81% (Kim et al, 2019). An estimated 600 million hours, or \$2 billion, are lost in the United States annually because of missed work or decreased functional abilities brought on by menstrual pain and associated symptomatology (Ferries-Rowe et al, 2020). Primary dysmenorrhea (PD) and secondary dysmenorrhea (SD) are the two categories into which dysmenorrhea is divided when examined pathophysiologically (Bernardi et al, 2017). While SD describes menstrual pain linked to underlying pelvic pathology, PD refers to menstrual pain that does not have an organic or underlying pelvic pathology. PD pain occurs with an increase in the intensity of contractions in the uterine muscles due to the rise in the level of the hormone prostaglandin (Jensen et al, 2018).

Dysmenorrhea causes various limitations in the social environment, daily life, academic, and sports activities of adolescents and young women. In addition, it negatively affects concentration, mental health, and performance (Kim et al, 2019; Guimaraes et al, 2020). The pelvic floor is a dynamic structure of bones, connective tissue, and muscles. It supports intra-abdominal organs and maintains urinary, anal and sexual function (Quaghebeur et al., 2021). The structures forming the pelvic floor provide support in the event of physiological chronic intra-abdominal pressure increases with evolutionary changes.

An examination of the literature revealed no study that evaluated the pelvic floor functions of women with or without primary dysmenorrhea. This study hypothesizes that women with primary dysmenorrhea experience more severe impairment in pelvic floor function compared to healthy individuals and that this impairment negatively affects their quality of life. By evaluating pelvic floor function in both groups, this study aims to provide insight into the potential role of pelvic floor dysfunction in primary dysmenorrhea and its impact on daily life. The study aims is to assess pelvic floor function and its effects on quality of life in women with primary dysmenorrhea and a healthy control group and to investigate the relationship between primary dysmenorrhea and pelvic floor function.

2. Methods

The study was carried out between 30.12.2021 and 15.04.2022 with women from Istanbul Rumeli University Physiotherapy and Application Center who agreed to participate. This study was designed as a prospective, single-centre, non-randomized cross-sectional study.

This study aimed to test the hypothesis that women with primary dysmenorrhea exhibit more significant impairment in pelvic floor function compared to healthy controls and that this impairment negatively impacts their quality of life. To achieve this, pelvic floor function and its effects on quality of life were evaluated in women with primary dysmenorrhea and a healthy control group. The study was planned to examine pelvic floor function in women with or without primary dysmenorrhea. According to the G power analysis, a minimum of 130 women needed to be included with an effect size of 0.5, a margin of error of 0.05, and a power of 80%, and 145 individuals participated in our study (Armour et al., 2019). With 145 participants enrolled (104 in the primary dysmenorrhea group and 41 in the healthy control group), the sample size exceeded the minimum requirement, ensuring sufficient statistical power for valid comparisons between groups. The study included a total of 145 women aged 18 to 35 years who provided written informed consent. Participants were divided into two groups based on specific diagnostic criteria: the primary dysmenorrhea group and the healthy control group.

The primary dysmenorrhea group consisted of 104 women diagnosed with primary dysmenorrhea, defined as recurrent menstrual pain in the absence of underlying pelvic pathology, confirmed through self-reported history and the exclusion of secondary causes via clinical evaluation. The healthy control group comprised 41 women with no history of dysmenorrhea, reporting regular menstrual cycles without significant pain, and meeting the same exclusion criteria. Exclusion criteria for both groups included motor disability, regular use of non-steroidal anti-inflammatory drugs, secondary dysmenorrhea, endometrial polyps, myoma uteri, endometriosis, and pregnancy. Group classification was based on a detailed medical history collected via a structured questionnaire, which also assessed age, height, weight, marital and educational status, occupation, number and types of births, and miscarriage history.

Menstrual duration and frequency were recorded. The visual analogue scale (VAS) was used to determine the severity of pain, the Pelvic Floor Distress Inventory (PFDI) to determine pelvic

floor function, and the Pelvic Floor Impact Questionnaire (PFIQ) to assess the impact of pelvic floor problems on the person's life.

2.1. Data Collection Tools

The VAS was used to measure the severity of pain. The participants were asked to mark zero (0) if they had no pain and ten (10) if they had very severe pain (Iacovides et al., 2015).

The PFDI scale, developed by Barber et al., consists of 20 questions and 3 subfactors [Pelvic Organ Prolapse Distress Inventory (POPDI), Colorectal-Anal Distress Inventory (CRADI), and Urinary Distress Inventory (UDI)] (Barber et al., 2011). A high score represents an increase in pelvic floor dysfunction (Burnett and Lemyre, 2017).

The PFIQ, whose reliability and validity in Turkish were confirmed by Balkanlı Kaplan et al., consists of 3 subdomains, namely urinary incontinence, bowel complaints, and pelvic organ prolapse, and a total of 7 questions (Kho and Shields, 2020). The questionnaire assesses the impact of these problems on a person's life. Scores range from 0 to 300, with higher scores indicating a greater negative impact of pelvic floor dysfunction on quality of life

2.2 Statistical Analysis

The statistical analyses were performed using IBM SPSS 22.0 (SPSS Inc.; Chicago, IL, USA). Continuous variables were given as mean ± standard deviation and minimum and maximum, and categorical variables as numbers and percentages. Spearman correlation analysis was used to examine the relationship between nonparametric variables, and the Mann–Whitney U test was used to compare paired groups.

2.3. Ethical Consideration

Ethical approval for the study was obtained from the Ethics Committee of İstanbul Rumeli University (Date: 01.11.2021, Issue number: 10/8). The Declaration of Helsinki conducted the study.

3. Results

The mean age of the 145 women between the ages of 18 and 35 who participated in the study was 23.79±0.348. While 22.8% (n=33) of the participants were married, 77.2% (n=112) were single. Moreover, 96.6% (n=140) of the participants did not have any pelvic disease and 71.7% (n=104) had a diagnosis of primary dysmenorrhea; 8.3% (n=12) of the participants had given birth and 2.1% (n=3) had had miscarriages. The demographic information of the participants is given in Table 1.

Table 1. Demographic Characteristics of the Participants

Variables	Min-Max	X±SD
Age (years)	19-35	23.79±4.19
Weight (kg)	22-90	59.02±10.71
Height (cm)	156-178	163.57±9.67
	n=145	%
Education Status		
Primary education	2	1.4
High school	7	4.8
University	108	74.5
Postgraduate	28	19.3
Employment Status		
Working	50	34.5
Not working	95	65.5
Parturition		
Yes	Vaginal	1
	Cesarean	10
	Both	1
No	133	91.7
Miscarriage		
Yes	3	2.1
No	142	97.9
Menstruation Frequency		
more than 28 days	43	29.7
every 28 days	63	43.4
every 20-28 days	37	25.5
less than 20 days	2	1.4
Menstruation Duration		
7-10 days	29	20
5-7 days	100	68.97
less than 5 days	16	11.03
Diagnosis of Primary Dysmenorrhea		
Yes	104	71.72
No	41	28.28

X= Mean, SD= Standard Deviation, Min= Minimum, Max= Maximum

The menstrual pain severity of the participants was evaluated with a visual pain scale, and the mean score was 6.23±1.93 (Table 2). The VAS of the groups is given in Table 3. Group 1 had higher VAS scores (Table 3). 53.8% of the participants stated that they did not use medication for dysmenorrhea. 63.1% of participants reported using hot applications for dysmenorrhea (Table 2).

Table 2. Participants' Data on Pain

	Min-Max	X±SD
VAS	0-10	6.23±1.93
	n	%
VAS	0-3	17
	4-7	88
	8-10	40
Medication use for pain	Yes	67
	No	78
Application of heat for pain	Yes	93
	No	52

X= Mean, SD= Standard Deviation, Min= Minimum, Max= Maximum

The participants' PFDI and PFIQ subscale and total scores for the comparison of the two groups are given in Table 3. This shows that there was a significant difference between the two groups in terms of VAS, PFDI-POPDI, PFDI-CRADI, and PFDI total scores (Table 3).

Table 3. Comparison of the VAS, PFDI And PFIQ Scores for the Groups

Variables	PD Group (n= 104)	Healthy Group (n= 41)	p
	X±SD	X±SD	
VAS	6.97±1.76	4.37±2.52	<0.001*
PFDI POPDI	25.27±19.72	15.44±16.56	0.005*
CRADI	19.05±18.79	13.33±14.28	0.081*
UDI	16.78±19.32	12.39±13.25	0.184
PFDI-Total	61.11±50.38	41.18±34.18	0.021*
PFIQ UIQ	4.39±14.63	1.39±3.23	0.196
CRAIQ	6.77±15.67	0.34±1.64	0.221
POPIQ	3.66±14.51	10.65± 1.66	0.148
PFIQ-Total	15.01±42.06	5.34±10.65	0.149

Mann-Whitney U test *p<0.05, PFDI= Pelvic Floor Distress Inventory, POPDI= Pelvic Organ Prolapse Distress Inventory, CRADI= Colorectal Anal Distress Inventory, UDI= Urinary Distress Inventory, PFIQ= Pelvic Floor Impact Questionnaire, UIQ= Urinary Impact Questionnaire, CRAIQ= Colorectal Anal Impact Questionnaire POPIQ= Pelvic Organ Prolapse Impact Questionnaire, Min= minimum, Max= maximum, X= Mean, SD= standard deviation

According to the results, there was a moderate positive correlation between the diagnosis of primary dysmenorrhea and a high level of menstrual pain (r= 0.45; p<0.01) (Table 4). In addition, a weak negative correlation was found between the diagnosis of primary dysmenorrhea and the PFDI-POPDI subscale (r=0.237; p=0.004). There was a positive correlation between the diagnosis and PFDI total score (r=0.165; p=0.047). We found no correlation between the diagnosis and PFDI scores. A negative correlation was found between giving birth and increased PFDI-POPDI subscale scores (r=-0.184; p=0.027).

In addition, we found a correlation between VAS and PFDI-POPDI (r=0.354; p<0.001). There was a correlation between VAS

and PFDI-CRADI (r= 0.275; p= 0.001). A positive correlation was found for pain and all PFDI scores (p<0.005). PFIQ-POPIQ and PFIQ-Total were correlated with VAS. The usage of medication (p<0.001) and the application of heat (p<0.001) due to menstrual pain were correlated with VAS. The usage of medication was correlated with PFDI total and PFIQ total scores (p=0.021; p=0.026). There was a correlation between the application of heat and PFDI scores (r=0.221; p=0.008) (Table 4).

In addition, a low positive correlation (p<0.05) was found between an increase in VAS and PFIQ-CRAIQ (r=0.163; p<0.05) and PFIQ (r=0.169; p=0.042) scores. A moderate positive correlation was found between the participant's usage of medication due to menstrual pain and the diagnosis of primary dysmenorrhea (r=0.428, p<0.01), increased menstrual pain scores (r=0.461, p<0.001), and PFIQ-POPIQ subscale scores (r=0.245, p<0.001). In addition, a low positive correlation was found between medication use due to dysmenorrhea and PFDI-POPDI (r=0.201, p<0.05), PFDI-UDI (r=0.181, p<0.05), PFDI (r=0.191, p<0.05), PFIQ (r=0.185, p<0.05), and PFIQ-CRAIQ (r=0.192, p<0.05) scores. Application of heat due to menstrual pain was moderately positively correlated with presence of primary dysmenorrhea (r=0.329, p<0.01), increased severity of menstrual pain (r=0.306, p<0.01), PFDI-POPDI6 score (r=0.247, p<0.01), and PFDI score (r=0.221, p<0.01), and slightly positively correlated (r=0.173, p<0.05) with PFDI-CRADI subscale scores. A low positive correlation was found between the participants' PFDI total scores and PFIQ total scores (r=0.174, p<0.05).

Table 4. Examination of the Correlation Between Descriptive Variables and Scales

	Diagnosis of PD	Visual pain scale	PFDI- POPDI	PFDI- CRADI	PFDI -UDI	PFDI- Total	PFIQ- UIQ	PFIQ- CRAIQ	PFIQ- POPIQ	PFIQ -Total	
Diagnosis of PD	r	1	0.45**	-0.237**	0.132	0.067	0.165*	0.008	0.084	0.094	0.101
	p	.	<0.001	0.004	0.114	0.420	0.047	0.919	0.314	0.260	0.228
Giving birth	r	-0.089	0.151	-0.184*	0.010	0.011	0.107	-0.055	-0.015	0.094	-0.014
	p	0.285	0.070	0.027	0.907	0.897	0.200	0.511	0.857	0.260	0.864
Visual pain scale	r	0.45**	1	0.354**	0.275**	0.231**	0.354**	0.115	0.163*	0.154	0.169*
	p	<0.001	.	<0.001	0.001	0.005	<0.001	0.167	0.050	0.064	0.042
Medication used for pain	r	0.428**	0.461**	0.201*	0.115	0.181*	0.191*	0.120	0.192*	0.245**	0.185*
	p	<0.001	<0.001	0.015	0.168	0.029	0.021	0.150	0.021	0.003	0.026
Application of heat for pain	r	0.329**	0.306**	0.247**	0.173*	0.142	0.221**	0.079	0.114	0.005	0.096
	p	<0.001	<0.001	0.003	0.038	0.088	0.008	0.344	0.172	0.957	0.250
PFIQ-Total	r	0.101	0.169*	0.269**	0.442**	0.241**	0.393**	0.639**	0.903**	0.504**	1
	p	0.228	0.042	0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	.

PFDI= Pelvic Floor Distress Inventory, POPDI= Pelvic Organ Prolapse Distress Inventory, CRADI= Colorectal Anal Distress Inventory, UDI= Urinary Distress Inventory, PFIQ= Pelvic Floor Impact Questionnaire, UIQ= Urinary Impact Questionnaire, CRAIQ= Colorectal Anal Impact Questionnaire POPIQ= Pelvic Organ Prolapse Impact Questionnaire, **p<0.01, *p<0.005, Spearman Correlation Analysis

4. Discussion

The present study aimed to investigate the effect on pelvic floor function and its impact on life quality in women with primary dysmenorrhea. According to the results of the study, the presence of primary dysmenorrhea affects prolapse, colorectal-anal discomfort, and overall pelvic floor function in women but does not impact quality of life. Nevertheless, a relationship was found between pain intensity and both pelvic floor function and the quality of life.

Primary dysmenorrhea is the most common gynecological disease in menstruating women (Iacovides et al., 2015; Burnett and Lemyre, 2017). In the literature, the prevalence of dysmenorrhea is 70.8%, although it varies from country to country (Armour et al, 2019). Consistent with the literature, 71.72% of the participants in our study were found to have primary dysmenorrhea. Moreover, 64% of the women stated that they had had pain due to dysmenorrhea for more than 3 years, and 89.3% classified the severity of pain as 4 or more. Despite this, 71% of the women did not seek medical help. It was observed that 64% of the women applied heat due to the severity of dysmenorrhea pain, and 46.2% took medication. Pelvic floor dysfunction is emerging as a significant health problem affecting women's quality of life (Binkova et al, 2021). Age and body mass index are important factors that can affect pelvic floor health (Rafique and Al-Sheikh, 2018). The women who participated in our study had an average age of 23 years and a normal body mass index range.

In our study, more than 80 percent of the participants had a university education and above. Education level is an important factor that can influence women's decisions to seek health services. Higher levels of education can lead to greater awareness of health knowledge and access to health services. This can influence treatment seeking and attitudes towards treatment. A study shows that individuals with higher levels of education pay more attention to health problems and are more active towards treatment (Payne et al., 2017).

A correlation was found between pelvic organ prolapse and the presence of primary dysmenorrhea, delivery status, and between dysmenorrhea-related pain severity and PFDI score. Therefore, it is seen that an increase in pain intensity increases pelvic floor dysfunction. A correlation was also found between pain severity and PFIQ score. As the pain intensity of the women who participated in our study increases, the problems experienced with

the pelvic floor affect the quality of life of the person. Moreover, pelvic floor dysfunction was observed in patients seeking medication due to dysmenorrhea, and their quality of life was affected by pelvic floor symptoms. However, although pelvic floor dysfunction was observed in women who applied heat for dysmenorrhea, there was no correlation with quality of life. Therefore, it can be concluded that in women with primary dysmenorrhea, pelvic floor dysfunction and its effect on their quality of life increase the need for medical treatment.

Women with pelvic floor disorders are assessed by the PFDI and the PFIQ (Barber et al., 2011; Barner et al, 2001). In clinical practice, the former is utilized to evaluate the severity of distress caused by pelvic floor symptoms.

In a study on women with chronic pelvic pain, abnormal musculoskeletal findings were reported. It was found that there are more trigger points in the abdominal and pelvic floor muscles and less pelvic floor muscle control. In other research, it was reported that pelvic myofascial pain also presents as pelvic pain or as urogynecological problems (Adams et al, 2013; Zhuo et al., 2021). In a study conducted on women with dysmenorrhea, it was reported that pelvic floor muscles may affect the bladder, bowel and sexual functions and it was stated that it should be questioned (Navroski et al, 2024).

In addition, it was observed that both pelvic organ prolapse and pelvic floor function were significantly affected in patients with primary dysmenorrhea. Pelvic floor function is affected in individuals with primary dysmenorrhea. It has also been found that giving birth affects pelvic organ prolapse. In a retrospective study reported in the literature, 300 mothers were evaluated, and there was no correlation between delivery mode and pelvic floor function in primiparous women three to four years after birth (Schütze et al., 2022). On the other hand, the negative effect of pain and fears related to childbirth has a significant negative impact on pelvic floor function years after birth.

In our study, there was no difference in quality of life between women with and without dysmenorrhoea. However, correlation analysis showed an association between pelvic floor function and quality of life scales. This may indicate that women with primary dysmenorrhoea may have high PFDI scores, but this may not be reflected in their quality of life (PFIQ). This may be because women with chronic pain may develop pain tolerance or develop different coping strategies to support quality of life. Individuals

use methods such as hot applications and breathing exercises to manage pain (Payne et al, 2017; Fillingim, 2017). In addition, the PFIQ scale may not have captured small changes in quality of life. Other scales may need to be used for a more detailed assessment (Guyatt et al, 1993; Hashim et al 2020).

4.1. Limitations

The present study has several limitations that should be acknowledged. First, the limitation of the study is that objective methods such as EMG of pelvic floor function were not used, and the participants were not physically evaluated. Second, the sample size may not have been large enough to detect subtle differences or generalize the findings to a broader population. A larger sample size would increase the statistical power and provide more robust conclusions. Lastly, the study did not investigate the impact of other potential influencing factors, such as psychological factors (e.g., stress, anxiety) or lifestyle behaviours (e.g., physical activity, diet), which could also affect pelvic floor health and quality of life.

5. Conclusion

Primary dysmenorrhea is a critical health problem in women's lives, and more studies are needed on the subject. The presence of primary dysmenorrhea affects pelvic floor function, but the presence of primary dysmenorrhea does not affect quality of life. These findings highlight the importance of further research to gain a deeper understanding of the complex relationship between pelvic pain and pelvic floor health. From a clinical perspective, the study emphasizes the importance of considering pelvic floor function in the management of women with primary dysmenorrhea. Given the potential for pelvic floor dysfunction to contribute to the severity of dysmenorrhea symptoms, healthcare providers should consider incorporating pelvic floor physiotherapy or other interventions aimed at improving pelvic floor function as part of comprehensive care for these patients. It sets the stage for future investigations that could influence clinical practice by improving the management and treatment strategies for women suffering from primary dysmenorrhea.

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It is declared that scientific and ethical principles were complied with during the preparation of this study and all the studies used in this study were cited in the bibliography.

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Veri Toplanması (CRediT 2)	OB (%30) - MÇ (%40) ED (%40)
Araştırma - Veri Analizi - Doğrulama (CRediT 3-4-6-11)	OB (%40) - MÇ (%40) ED (%30)- NY (%10)
Makalenin Yazımı (CRediT 12-13)	OB (%30) - MÇ (%30) ED (%20)- NY (%20)
Metnin Geliştirilmesi ve Tashihi (CRediT 14)	OB (%30) - MÇ (%20) ED (%20)- NY (%30)
Research Design (CRediT 1)	OB (%50) - MÇ (%20) ED (%20)- NY (%10)
Data Collection (CRediT 2)	OB (%30) - MÇ (%40) ED (%40)
Research - Data Analysis - Verification (CRediT 3-4-6-11)	OB (%40) - MÇ (%40) ED (%30)- NY (%10)
Writing the Article (CRediT 12-13)	OB (%30) - MÇ (%30) ED (%20)- NY (%20)
Development and Revision of the Text (CRediT 14)	OB (%30) - MÇ (%20) ED (%20)- NY (%30)

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