

RESEARCH ARTICLE

- Hanife Dogan¹**
Melike Demir Caltekin²
Taylan Onat²
Demet Aydoğan Kirmizi²
Emre Baser²
Ethem Serdar Yalvac²

¹Yozgat Bozok University,
Sarıkaya School of Physiotherapy
and Rehabilitation, Yozgat,
Turkey

²Yozgat Bozok University,
Medical Faculty, Department of
Obstetrics and Gynecology,
Yozgat, Turkey,

Corresponding Author:

Hanife Dogan
Yozgat Bozok University, Sarıkaya
School of Physiotherapy and
Rehabilitation, Yozgat, Turkey
mail: hanife_dogan@yahoo.com.tr
Phone: +90 5075346142

Received: 27.04.2020

Acceptance: 22.06.2020

DOI: 10.18521/ktd.727929

Konuralp Medical Journal
e-ISSN1309-3878
konuralptipdergi@duzce.edu.tr
konuralptipdergisi@gmail.com
www.konuralptipdergi.duzce.edu.tr

Approaches of Dealing with Primary Dysmenorrhea and Relationship between Kinesiophobia and Pain Severity

ABSTRACT

Objective: In this study, the most preferred methods of Primary Dysmenorrhea (PD) individuals to cope with menstrual pain and the relationship between kinesiophobia and pain severity were investigated.

Methods: This prospective study was conducted at Yozgat Bozok University Obstetrics and Gynecology Clinic. Sociodemographic information and complementary and alternative techniques which used to reduce pain with PD diagnosis were recorded. Pain severity with visual analog scale and motion fear levels of PD patients were evaluated with Tampa Kinesiophobia questionnaire.

Results: The study included 100 PD individuals with an average age of 20.05 ± 2.6 years and Body Mass Index (BMI): 22.17 ± 3.35 kg / m². As a result of the study; it was stated that in order to overcome the pain related to PD, 72% of individuals lay down and rest, 63% cotton dressing, 56% rub the abdomen, 54% listen to music, 52% apply hot on feet, 50% take analgesics, 49% apply hot to the lower abdomen, 47% take hot shower, 36% pray, 34% classic massage, 31% distraction, 31% keep the waist area warm, 26% lie facedown, 26% drink chamomile tea, 25% drink green tea, 25% daydreaming, 22% do diaphragmatic breathing exercises, 23% do aerobic exercises. In addition, a positive correlation was found between kinesiophobia and pain severity. ($p<0,05$).

Conclusions: This study showed that traditional methods were more preferable than exercise in PD and individuals with high pain severity had more fear of movement. The fear of movement of women with PD, doing or not doing exercise should be investigated.

Keywords: Pain, Exercise, Movement, Fear, Primary Dysmenorrhea, Complementary Treatments

Primer Dismenore ile Baş Etmek için Kullanılan Yöntemler ve Kinezyofobinin Ağrı Şiddeti ile İlişkisi

ÖZET

Amaç: Bu çalışmada Primer Dismenoreli (PD) bireylerin menstrüel ağrı ile baş etme konusunda en çok tercih ettiği yöntemler ve kinezyofobinin ağrı şiddeti ile ilişkisi araştırıldı.

Gereç ve Yöntem: Bu prospektif çalışma Bozok Üniversitesi Kadın Hastalıkları ve Doğum Polikliniğinde gerçekleşti. PD tanısı alan bireylerin sosyodemografik bilgileri ve ağrıyı azaltmak için kullandığı tamamlayıcı ve alternatif yöntemler kaydedildi. PD'li bireylerin ağrı şiddeti vizüel analog skalası ile hareket korku düzeyleri ise Tampa Kinezyofobi anketi ile değerlendirildi.

Bulgular: Çalışmaya yaş ortalaması $20,05 \pm 2,6$ yıl, ortalama Vücut Kütle İndeksi (VKİ): $22,17 \pm 3,35$ kg/m² olan 100 PD'li birey dahil edildi. Çalışmanın sonucunda bireylerin %72'si yatıp dinlenme, %63'ü pamuklu giyinme, %56'sı karnı ovalama, %54'ü müzik dinleme, %52'si ayaklara sıcak uygulama, %50'si ağrı kesici, %49'u alt karına sıcak uygulama, %47'si sıcak duş, %36'sı dua etme, %34'ü klasik masaj, %31'i dikkati dağıtma, %31'i bel kısmını bağlama, %26'sı yüzüstü yatma, %26'sı papatya çayı, %25'i yeşil çay, %25'i hayal kurma, %22'si diyaframatik nefes egzersizleri, %23'ü aerobik egzersiz yaptığını belirtti. Ayrıca kinezyofobi ile ağrı şiddeti arasında pozitif yönde bir korelasyon bulundu ($p<0,05$).

Sonuç: Bu çalışma PD'de geleneksel yöntemlerin egzersizden çok daha fazla tercih edildiğini ve ağrı şiddeti yüksek olan bireylerde hareket korkusunun daha fazla olduğunu göstermektedir. Egzersiz yapan ve yapmayan PD'li kadınların hareket korkusu araştırılmalıdır.

Anahtar Kelimeler: Ağrı, Egzersiz, Hareket, Korku, Primer Dismenore, Tamamlayıcı Tedaviler

INTRODUCTION

Primary Dysmenorrhea (PD) is described pain during menstruation without any organic pathology (1). The incidence is greatest in young women and decreases with age (2). Pain is the most common symptom that is localized in the lower abdomen, resembling birth pain and can spread to the suprapubic region, thighs, lumbar region and lower back. Also headache, nausea, constipation, diarrhea, incontinence and vomiting can be seen. It usually starts on the 1st day of menstruation and ends on the 3th day (3). Women with PD participate in less social activities, are less able to take responsibility, need more time to rest, have higher rates of absenteeism at work or school (4). Although PD does not threaten life, it negatively affects the quality of life and has become a public health problem in the world (5). Many women with PD have used complementary and alternative medicine, for examples reducing physical activity, change their diet, apply hot application, reducing sleep duration, walking, using ginger, vitamin and mineral supplements (eg. magnesium and vitamin B1), omega 3 and 6, wearing cotton clothes, taking hot showers, taking hot liquids, and taking analgesics (6-8). These methods inhibit prostaglandin production, which causes pain with their physiological or psychological aspects, and some of them have been traditionally practiced for years.

In studies, vitamin B and E and omega-3 inhibit protein kinase C, inhibiting the conversion of arachidonic acid and phospholipids into prostaglandins in the cell membrane. The anti-inflammatory feature of ginger is that fennel tea inhibits the production of prostaglandins by secreting mefenamic acid, and rose tea contains abundant amounts of vitamin A, B, C, E, K; local temperature application reduces pain as it causes vasodilation, listening to music provides cognitive pain management and methods such as lying down can reduce uterine contraction (9-12). It is also stated in the literature that regular exercises can decrease the menstrual pain and symptoms by increasing the blood flow to the uterus. In this way, inflammatory cytokines are removed faster (13-16).

Kinesiophobia means fear of movement, and as a result of increased pain perception, the person is afraid of move and shows the avoidance response to coping with pain. It shows that kinesiophobia usually occurs between low back and neck region, and as a result, individuals avoid to act (17). Our aim in this study, which we came up with the hypothesis that symptoms such as thigh, abdomen, and lower back pain, which are frequently encountered during menstrual pain, can also cause movement avoidance, and that immobility may increase pain, is to determine the alternative and complementary treatment methods preferred by women with PD in the treatment and to evaluate the relationship of dysmenorrhea with kinesiophobia.

MATERIAL AND METHODS

This prospective study consisted of 18-35 ages nulliparous women who applied to the Obstetrics and Gynecology outpatient clinic of Yozgat Bozok University and diagnosed with PD. According to the Primary Dysmenorrhea Consensus Guide, our study was performed on 100 individuals having a regular menstrual cycle (28 ± 7 days) and menstrual pain higher than 4 mm according to Visual Analogue Scale (VAS) for the last 6 months. "Informed consent form" was taken from the cases and the cases were informed about the study in accordance with the Helsinki Declaration. This study was approved by the clinical ethics committee (Decision No: 2017-KAEK-189_2020.02.12_02).

Gastrointestinal, urogynecological, autoimmune, psychiatric diseases, other chronic pain syndromes, childbirth, positive pregnancy test, those who use intrauterine devices, those who have had pelvic surgery, those with irregular menstrual cycles (those who have a cycle period shorter than 21 days or longer than 35 days) and those who have a pathological history of secondary dysmenorrhea and ultrasonographic imaging were not included in the study.

Physical (age, height, body weight, body mass index) and demographic (age of menarche, mean cycle time, duration of menstruation, painful menstrual condition, duration of pain due to dysmenorrhea) informations were recorded for all participants.

VAS (ranging from 0 to 10 cm) was used to determine the severity of menstrual pain of each individual. VAS has also been shown to be a sensitive, valid and reliable tool for minor changes in pain intensity as a result of clinical pain and treatment (18). The point marked on the line was measured with a ruler, and the pain intensity that people felt during menstruation was recorded in cm. The most severe pain severity level experienced by the individuals in the first 3 days of menstruation was evaluated.

The questionnaire form included the most used methods in the literature used to reduce menstrual pain, such as green tea, rose tea, chamomile tea, black tea, fennel tea, ginger, linden, salt-free diet, Omega-3, vitamin E and B capsules, massage, praying, yoga, acupuncture, acupressure, reflexology, hypnosis, listening to music, breathing exercises, imagination, applying warm to the abdomen, applying warm to the feet, taking a hot shower, keeping the waist area warm, lying on her stomach, rubbing the abdomen, cotton dressing, lying down and resting, distraction, regular exercises were asked to mark which method the participants preferred.

The fear of movement that individuals experienced due to pain during menstruation was evaluated using the Tampa Kinesiophobia Scale (TKS). Vlaeyen et al. revised this scale in 1995. TKS

is a 17-question scale developed to measure the fear of injury again during the movement. TKS includes pain, injury/re-injury and fear-avoidance parameters in work related activities. The person gets a total score between 17-68. The high score on the scale shows that kinesiophobia is also high. It is recommended to use the total score in the studies. Tunca Yılmaz et al. validated the Turkish version of TKS (17).

Statistical Analysis: Statistical package program SPSS 20 (IBM Corp. released 2011. IBM SPSS Statistics for Windows, version 20.0, Armonk, NY: IBM Corp.) was used to evaluate the data. Data was expressed as mean±SD and in percentages. Continuous variables were investigated using analytical methods (Kolmogorov-Smirnov) to determine whether or not they are normally distributed. Bivariate correlations were investigated by Spearman’s correlation analysis. $p < 0.05$ were accepted as statistically significant.

Table 2. Menstrual information of women with Primary Dysmenorrhea

| | | n | % |
|-------------------------|-------|----|-----|
| Time since menarche (y) | 10-12 | 32 | %32 |
| | 13 | 52 | %52 |
| | 14-18 | 16 | %16 |
| Discontinuity to school | No | 37 | %37 |
| | Yes | 63 | %63 |
| Pain duration (hours) | <48 | 78 | %78 |
| | 48-72 | 20 | %20 |
| | >72 | 2 | %2 |
| Medication use (number) | Yes | 50 | %50 |
| | No | 50 | %50 |

Percentage expression of the complementary and alternative methods used by individuals to reduce menstrual pain were presented in Table 3. As a result of the study it was stated that, 72% of individuals lie down, 63% prefer cotton dressing, 56% rub the abdomen, 54% listen to music, 52% apply hot on feet, 50% take analgesics, 49% apply hot to the lower abdomen, 47% take hot shower, 36% pray, 34% had classical massage, 31% distraction, 31% keep the waist area warm, 26% lie facedown, 26% drink chamomile tea, 25% drink green tea, 25% daydream, 22% do diaphragmatic breathing exercises, 23% do aerobic exercise (which consists of 25% walking, 1% swimming, 7% plates, 3% cycling activity), 15% drink black tea, 15% drink fennel, 12% had unsalted diet, 10% drink ginger, 7% take vitamins E and B, 5% take omega 3 and 6, 3% take vitamin D and 2% do yoga.

Regarding the effect of these methods on their pain, 57% of these participants of reduced their pain with the method they used, 14% claimed to be psychological, 13% stated their complaints passed, 8% of them said that they were useless and 8% of them stated that they affected their health negatively (Table 4). There was a strong positive correlation between the pain severity levels experienced by the individuals during the menstrual period and the average fear of movement score obtained from the Tampa kinesiophobia questionnaire (Table 5) ($p < 0.05$, $r = 0.667$).

RESULTS

A total of 105 cases with PD diagnosis were evaluated for this study. 3 people who were not willing to participate in the study and 2 people who had undergone surgery were excluded from the study.

The study was carried out with 100 PD individuals with an average age of 20.05 ± 2.6 years, average BMI: 22.17 ± 3.35 kg / m². The physical and demographic characteristics of the individuals in the study were shown in Table 1 and the features associated with menstruation were shown in Table 2.

Table 1. Age and BMI information of cases with Primary Dysmenorrhea

| | n | Min ± Max | X±S.D. |
|--------------------------|-----|-----------|--------------|
| Age (years) | 100 | 17 ± 35 | 20.05 ± 2.60 |
| BMI(kg/ m ²) | 100 | 17 ± 32 | 22.17 ± 3.35 |

Min ± Max: Minimum ± maksimum, X±S.D: Aritmetik ortalama ± Standart Sapma, BMI: Vücut kütlesi indeksi

Table 3. Distribution of CAM used by women with PD to deal with dysmenorrhea

| CAM | n | % |
|--|----|-----|
| Nutritional methods | | |
| Green tea | 25 | %25 |
| Rose tea | 1 | %1 |
| Chamomile tea | 26 | %26 |
| Black tea | 25 | %25 |
| Fennel | 15 | %15 |
| Ginger | 10 | %10 |
| Salt-free diet | 12 | %12 |
| Vitamins E and B | 7 | %7 |
| Omega | 5 | %5 |
| Vitamin D | 3 | %3 |
| Other methods | | |
| Massage | 34 | %34 |
| Praying | 36 | %36 |
| Listening to music | 54 | %54 |
| Yoga | 2 | %2 |
| Breathing exercises | 22 | %22 |
| Imagination | 25 | %25 |
| Applying hot to the lower abdomen | 49 | %49 |
| Applying hot on feet | 52 | %52 |
| Hot shower | 47 | %47 |
| Keeping the waist area warm | 31 | %31 |
| Lying down | 26 | %26 |
| Rubbing the abdomen | 56 | %56 |
| Cotton dressing | 63 | %63 |
| Lay and rest | 72 | %72 |
| Drawing attention to another direction | 31 | %31 |
| Exercises | | |
| Walking | 23 | %23 |
| Swimming | 25 | %25 |
| Plates | 1 | %1 |
| Cycling activity | 7 | %7 |
| | 3 | %3 |

CAM: Complementary and Alternative Methods

Table 4. Effect of CAM used by Primary Dysmenorrhea individuals

| | n | % |
|---------------------------|----|-----|
| Complaints passed | 13 | %13 |
| Reduce pain | 57 | %57 |
| No benefit | 8 | %8 |
| Negative impact on health | 8 | %8 |
| Psychological effects | 14 | %14 |

Table 5. The relationship between pain severity and Tampa kinesiophobia score

| | | Tampa kinesiophobia score |
|----------------------|-----------------------------|---------------------------|
| Pain severity | Correlation coefficient (r) | 0.679 |
| | p | 0.001* |

DISCUSSION

PD is one of the most common non-pathological gynecological problems in young women. Individuals want to use fast and non-pharmacological methods without side effects in order to cope with this pain for many years. It is also stated that exercise and physical activity reduce pain, but there are still not enough studies whether individuals restrict their physical activities due to pain. In our study, we investigated the most commonly used methods of coping with PD. We determined that 72% of individuals with PD lie and rest, 54% listen to music, 49% prefer warm application to lower abdomen, 52% preferred warm applications to feet, 47% preferred traditional practices such as hot showers but exercise rates (23%) were quite low. In addition, we concluded that individuals with higher fear of movement had higher pain severity.

In his study on dysmenorrhea, Demirci found that 78.8% of women preferred more complementary and alternative methods (CAT) to cope with pain and that CAT was more common in women who did not use drugs to deal with dysmenorrhea (19). Kahyaoğlu et al. (20) found that 35.2% of individuals with PD had linden tea, 31% of whom preferred green tea, 30% chamomile tea, 27.3% hot milk, 22.4% black tea, 18.2% cinnamon, 14% fennel tea and 13.5% cherry stalk tea. Gün et al. (21) were determined that women with dysmenorrhea preferred more herbal methods (28.4%) such as 15.1% chamomile tea, 11.8% black tea, 11.8% sage, 7.9% linden, 6.6% parsley tea, 6.0% rose tea, 5.3% yarrow tea, 5.3% thyme tea, 5.3% balm tea, 2.6% green tea and 5.7% drink warm milk. Graz et al. (22) found that 23% of individuals with dysmenorrhea problems preferred nutritional supplements and herbal drinks. Houston et al. (23) concluded that 20% of individuals with dysmenorrhea used black tea. In our study, the rate of using herbal beverages in dealing with PD was similar to the literature. This might be due to the fact that the beliefs and traditional structure of the different society continues and they did not know much about different herbal products. Eryılmaz et

al. (24) investigated the drug use rate of adolescents in dealing with dysmenorrhea and found the amount 46.1%. Gün et al. (21) found that 51.7% of individuals with dysmenorrhea used analgesics in their studies. In our study, we found that the rate of analgesia use in women with PD 50%. These results showed that women used medication to deal with menstrual pain without consulting a Physician. So their health might be effected negatively.

Chen et al. (25) talked about reducing physical activity, using herbal or pain medication, paying attention to nutritional changes and emotional support in terms of personal care strategies of women with PD. Şentürk Erenel et al. (26) in his studies, resting (65.4%) took the first place to deal with the complaints of dysmenorrhea. Yılmaz et al. (27) stated that the most preferred methods of dysmenorrhea students in dealing with pain were sleep (64.2%), massaging the painful area (53.4%) and hot showers (51.6%). In our study, we found that their methods were more traditional and did not require sufficient physical activity. We found that exercise was very low (23%) and these exercises were mostly walking. The high rate of pain intensity of these individuals and the low rate of relieving their pain suggested that sedentary life might contribute to their pain.

In studies related to kinesiophobia, it was mostly investigated in problems such as chronic low back pain and knee pain, and it was mentioned that it made individuals' daily activities difficult, and that immobility could cause chronic diseases and this may effect the rehabilitation process negatively (28). Güçlü et al. (29) stated in his study on 105 people with low back pain that as the severity of pain increased, the level of kinesiophobia increased. Many symptoms such as lumbal, sacral, abdominal, general body ache and headache, limb cramps, difficulty in normal activities, tenderness and edema in breasts can cause movement limitation (30). In the literature, studies showing whether the level of physical activity for individuals with PD will increase or decrease pain severity (31). William et al. (32) stated that exercise will decrease the sense of pain and symptoms by increasing beta endorphin levels. Motesharee et al. (33) found that PD symptoms decreased with 8-week stretching exercises in women with PD. Abbaspour et al. (34) stated that physical exercise had positive affects in students with dysmenorrhea and decreased their situations such as discontinuity to school. There was no complete clarity about the relationship between exercise and dysmenorrhea. In our study, individuals with high kinesiophobia levels had higher severity of pain and a relatively low rate of exercising might show that individuals had avoided exercise due to pain.

Lack of a healthy control group was among the limitations of the study. The strength of the study was that it addressed both alternative and

complementary methods used in PD and raised awareness that individuals with PD might have exercise avoidance behaviours for fear of pain. In the future, studies involving individuals who control and do not exercise that should be planned.

As a result, individuals with PD used various complementary and alternative methods and preferred methods that did not require high physical

activity. Kinesiophobia could be seen in individuals with PD due to pain. This situation created a tendency for negative behaviours such as being sedentary and discontinuity to school in individuals with PD. Therefore, it may be more effective in order to manage pain by preferring methods such as exercise in order to ensure the combination of daily work life in women with PD.

REFERENCES

1. De Sanctis V, Ashraf S, Sergio B, et al. Definition and Self-Reported Pain Intensity in Adolescents with Dysmenorrhea: A Debate Report. *J Pediatr & Child Health Care*. 2016; 1(1): 1-6.
2. Beckmann CRB, Link FW, Barzansky BM, Herbert WNP, Laube DW, Smith RP. Obstetric and Gynecology. In: Beckmann CRB, Link FW, Barzansky BM, Herbert WNP, Laube DW, Smith RP, editörs. *Dysmenorrhea and Chronic Pelvic Pain*. China: Lippincott Williams and Wilkins; 2010; p.277-282. Available from: <http://blog.utp.edu.co/doctorgaviria/files/2015/11/Obstetrics-Gynecology-ACOG.pdf>;
3. Mayo JL. A Healthy Menstrual Cycle. *Clinical Nutrition Insights*. 1997; 5(9); 1-8.
4. Chiu MH, Wang HH, Hsu SC, et al. Dysmenorrhea and self-care behaviours among hospital nurses: a questionnaire survey. *J Clin Nurs*. 2013; 22: 3130-40.
5. Hailemeskel S, Demissie A, Assefa N. Primary dysmenorrhea magnitude, associated risk factors, and its effect on academic performance: evidence from female university students in Ethiopia. *Int J Womens Health*. (2016) 19; 8: 489-496
6. Biro F, Bloemer NL. "Complementary Medicine": Complementary and alternative health approaches in pediatric and adolescent gynecology. *Journal of Pediatric and Adolescent Gynecology*. 2018.
7. Abaraogu UO, Tabansi-Ochuogu CS. As Acupressure Decreases Pain, Acupuncture May Improve Some Aspects of Quality of Life for Women with Primary Dysmenorrhea: A Systematic Review with Meta-Analysis. *J Acupunct Meridian Stud*. 2015; 8(5): 220-228.
8. Chiou MH, Wang HH, Yang YH. Effect of systematic menstrual health education on dysmenorrheic female adolescents' knowledge, attitudes, and self-care behavior. *Kaohsiung J Med Sci*. 2007; 23(4):183-90.
9. Coşkuner Potur D, Kömürçü N. Dismenore Yönetiminde Tamamlayıcı Tedaviler. *Hemşirelikte eğitim ve araştırma dergisi*. 2013;10 (1): 8-13.
10. Proctor M1, Farquhar C. Diagnosis and management of dysmenorrhea. *BMJ*. 2006; 332(7550):1134-8.
11. McRee, LD, Noble, S, Pasvogel, A. Using Massage and Music Therapy to Improve Postoperative Outcomes. *AORN JOURNAL*. 2003; 78(3): 433-447.
12. Proctor, ML, Farquhar CM. Dysmenorrhea. *Clinical Evidence* 2007; 3(813): 1-25.
13. Hornsby PP, Wilcox AJ, Weinberg CR. Cigarette smoking and disturbance of menstrual function. *Epidemiology*. 1998;9(2):193-8.
14. Aykut M, Günay O, Gün I, ve ark. Biyolojik, sosyo-demografik ve nutrisyonel faktörlerin dismenore prevalansına etkisi. *Erciyes Tıp Dergisi*. 2007; 29: 392-402.
15. Ortiz MI, Cortés-Márquez SK, Romero-Quezada LC, et al. Effect of a physiotherapy program in women with primary dysmenorrhea. *Eur J Obstet Gynecol Reprod Biol*. 2015; 194:24-9.
16. Zurawiecka M, Wronka I. Association of primary dysmenorrhea with anthropometrical and socio-economic factors in Polish university students. *J Obstet Gynaecol Res*. 2018; 44(7): 1259-1267.
17. Tunca Yılmaz Ö, Yakut Y, Uygur F, Uluğ N. Tampa Kinezyofobi Ölçeği'nin Türkçe versiyonu ve test-tekrar test güvenilirliği. *Fizyoterapi Rehabilitasyon*. 2011; 22(1): 44-49.
18. Price D, McGrath P, Rafii A, Buckingham B. The validation of visual analogue scales as ratio scale measures for chronic and experimental pain. *Pain* 1983;17:45-56.
19. Demirci D. Dismenore ile baş etmede kullanılan tamamlayıcı ve alternatif tedavi yöntemleri (Yüksek Lisans Tezi). Aydın: Adnan Menderes Üniversitesi Sağlık Bilimleri Enstitüsü, Kadın Sağlığı ve Hastalıkları Hemşireliği Anabilim Dalı Yüksek Lisans Tezi; 2017.
20. Kahyaoğlu Süt H, Küçükaya B, Arslan E. Primer Dismenore ağrısında tamamlayıcı ve alternatif tedavi yöntemleri kullanımı. *CBU-SBED*, 2019; 6(4):322-327.
21. Gün C, Demirci N, Otrar M. Dismenore yönetiminde tamamlayıcı alternatif tedavileri kullanma durumu. *Spatula DD*. 2014; 4(4): 191-197.
22. Graz B, Savoy M, Buclin T, Bonvin E. Dysmenorrhea: patience, pills or hot-water bottle? *Rev Med Suisse*. 2014; 10: 2285-2288.
23. Houston AM, Abraham A, Huang Z, et al. Knowledge, attitudes, and consequences of menstrual heal thin urban adolescent females. *J Pediatr Adolesc Gynecol*. 2006; 19: 271-275.
24. Eryılmaz G, Özdemir F, Pasinlioğlu T. Dysmenorrhea prevalence among adolescent in Eastern Turkey: its effects on school performance and relationships with family and friends. *Journal of Pediatrics Adolescent Gynecology* 2010;23(5):267-272.

25. Chen CH, Lin YH, Heitkemper MM, Wu KM. The self-care strategies of girls with primary dysmenorrhea: a focus group study in Taiwan. *Heal Care Women Int.* 2006;27(5):418–27.
26. Şentürk Erenel A, Şentürk İ. Sağlık Meslek Lisesi Öğrencilerinin Dismenore Yaşama Durumları ve Dismenore ile Baş Etmeye Yönelik Uygulamaları. *Hemşirelik Yüksekokulu Dergisi.* 2007:48–60.
27. Yılmaz, AB, Ocakçı A.F. Kız Öğrencilerin Dismenore ile Baş Etme Yöntemlerinin Belirlenmesi. *Hemşirelik E-Dergisi.* 2016;4(1): 1-8.
28. Özmen T, Gündüz R, Doğan H, ve ark. Kronik Bel Ağrılı Hastalarda Kinezyofobi ve Yaşam Kalitesi Arasındaki İlişki. *F.Ü.Sağ.Bil.Tıp Derg.* 2016; 30 (1): 1-4.
29. Güçlü DG, Güçlü O, Ozaner A, et al. The relationship between disability, quality of life and fear-avoidance beliefs in patients with chronic low back pain. *Turk Neurosurg* 2011; 22: 724-731.
30. Doğan H, Eroğlu S, Akbayrak T. Primer dismenorede gevşeme eğitiminin kısa süreli etkinliğinin incelenmesi. *Journal of Exercise Therapy and Rehabilitation.* 2019;6(2):78-85.
31. Orhan C, Çelenay ŞT, Demirtürk F, et al. Effects of menstrual pain on the academic performance and participation in sports and social activities in Turkish university students with primary dysmenorrhea: A case control study. *J Obstet Gynaecol Res.* 2018;44(11):2101-2109.
32. William JK, Nicholas AR. Hormonal responses and adaptations to resistance exercise and training. *Sports Med.* 2005; 35(4): 339-361.
33. Motesharee E, Mehboodı M, Karemzade L. The Effect Of An 8-Week-Flexibility Training On Primary Dysmenorrhea's Physical And Psychological Syndromes In Nonathletic Girls. *IJBPAS.* 2015; 4(12): 6659-6667.
34. Abbaspour Z, Rostami M, Najjar S. The effect of exercise on primary dysmenorrhea. *J Res Health Sci* 2006; 6: 26-31.