



Original Article

EVALUATION OF THE EFFECT OF MYOFASCIAL RELEASE TECHNIQUES ON PAIN AND GENERAL HEALTH STATUS IN PRIMARY DYSMENORRHEA

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ABSTRACT

Objective: The aim of this study is to evaluate the effect of myofascial release techniques on pain and general health status in primary dysmenorrhea.

Methods: Eighty women aged 18-25 years with primary dysmenorrhea were included in the study. After obtaining demographic information and information about the first menstrual cycle pain of all women, the severity of pain was evaluated with the Numerical Pain Scale, and general health status was evaluated with the General Health Questionnaire. After the evaluation, the subjects were divided into two groups. Myofascial release techniques were applied to the experimental group in the second menstrual cycle. No treatment was administered to the control group. The evaluations were repeated after the completion of the treatment.

Results: The mean age of the women participating in the study was 21.17 ± 1.65 years. When the first and second menstrual cycle parameters were compared between the groups, it was found that pain and general health status parameters showed a significant improvement in the experimental group ($p < 0.05$), while there was no significant difference in the control group ($p > 0.05$).

Conclusion: Our results show that myofascial release techniques in primary dysmenorrhea are effective in reducing pain and improving the general health status of individuals. Myofascial release techniques may be an alternative treatment for the relief of dysmenorrhea, reduction of drug use, and improvement of conservative treatment of dysmenorrhea.

Keywords: Dysmenorrhea, fascia, pain, sleep, depression

ÖZET

Amaç: Bu çalışmanın amacı primer dismenorede miyofasyal gevşetme tekniklerinin ağrı ve genel sağlık durumu üzerine etkisini değerlendirmektir.

Yöntem: Primer dismenorezi olan 18-25 yaş arası 80 kadın çalışmaya dahil edildi. Demografik bilgiler ve ilk menstrüel siklus ağrısı ile ilgili bilgiler alındıktan sonra, ağrı şiddeti Sayısal Ağrı Ölçeği ile, genel sağlık durumları ise Genel Sağlık Anketi ile değerlendirildi. Değerlendirme sonrasında bireyler iki gruba ayrıldı. Tedavi grubuna ikinci menstrüel siklusta miyofasyal gevşetme teknikleri uygulandı. Kontrol grubuna herhangi bir tedavi uygulanmadı. Değerlendirmeler tedavi tamamlandıktan sonra tekrarlandı.

Bulgular: Çalışmaya katılan kadınların yaş ortalaması 21.17 ± 1.65 yılıdır. Gruplar arasında birinci ve ikinci menstrüel siklus parametreleri karşılaştırıldığında, ağrı ve genel sağlık durumu parametrelerinin miyofasyal gevşetme grubunda anlamlı bir iyileşme gösterdiği ($p < 0,05$), kontrol grubunda ise anlamlı bir fark olmadığı tespit edilmiştir ($p > 0,05$).

Sonuç: Sonuçlarımız primer dismenorede miyofasyal gevşetme tekniklerinin ağrıyı azaltmada ve bireylerin genel sağlık durumunu iyileştirmede etkili olduğunu göstermektedir. Miyofasyal gevşetme teknikleri, dismenorenin giderilmesinde, ilaç kullanımının azaltılmasında ve dismenorenin konservatif tedavisinin iyileştirilmesinde alternatif bir tedavi olabilir.

Anahtar Kelimeler: Dismenore, fasya, ağrı, uyku, depresyon

INTRODUCTION

Dysmenorrhea is a word meaning pain observed during the menstrual cycle. It is a gynecological problem that restricts the daily life activities of majority of women in the reproductive age group, affects their lives negatively and causes loss of work (1). Epidemiological studies conducted in our country in the recent years show that the incidence of dysmenorrhea is approximately 60% (2, 3). Dysmenorrhea is categorized in two types as primary and secondary. Primary dysmenorrhea is defined as painful menstruation characterized by pain in the lower abdomen and usually accompanied by symptoms including sweating, headache, nausea, vomiting, diarrhea, and chills (4). Primary dysmenorrhea manifests itself as the painful cramps during the menstrual period without a pelvic pathology. Pain may radiate to the lumbar region, pelvis, and upper part of the leg (5, 6).

The aim in the treatment of dysmenorrhea is to relieve pain by affecting the physiological mechanisms causing pain or by alleviating the symptoms (7). Defining dysmenorrhea according to the severity of pain and the degree of limitation of daily activity may help to determine the treatment strategy (8). Treatment methods are directed towards the pathophysiology of the disease, regulation of myometrial tone and reduction of the prostaglandin level (4).

Myofascial Release Technique (MRT) is a technique applied with low load and over a long period of time to reduce adhesions which are present in the myofascial complex and to correct and optimize fascia mobility. The aim of this technique is to reduce pain and improve function (9, 10). Compared to other tissues, the numbers of studies on fascia are limited. In the literature, there is a hypothesis that fascial restrictions in one part of the body may cause excessive tension in another part of the body and this may cause stress in structures wrapped, divided, or supported by fascia (11). The MRT is considered to reduce the pressure on pain-sensitive structures by allowing the fascia to regain its functionality (12). The aim of this study is to evaluate the effect of myofascial release techniques on pain and general health status in primary dysmenorrhea. Therefore, we hypothesized that the MRT applied to individuals with

primary dysmenorrhea would be effective in the improvement of pain and general health status.

METHODS

The protocol of the present study was approved by the Clinical Research Ethics Committee of İnönü University (2017/68). The design of the present study is a randomized-controlled study. In the present study, a total of 80 participants were randomly assigned to either the intervention or control group, with a 1:1 allocation ratio. We performed the interventions at the Faculty Health Sciences, Department of Physical Therapy and Rehabilitation, İnönü University. The assessments were conducted at two different time points: first and second menstrual cycles.

Participants

Inclusion criteria were determined as 1) being between the ages of 18-25, 2) having pain and spasm complaints in the first 2 days of the menstrual cycle, 3) two or more symptoms according to the Weissmann scale, 4) agree to participate in the study, 5) being present at the faculty or clinical practice area on the days the data were collected, and 6) being a student with primary dysmenorrhea. Exclusion criteria were as follows: 1) having pelvic pathology, 2) having a history of pregnancy, 3) using a drug that causes or affects dysmenorrhea, and 4) not filling in the evaluation form completely.

Interventions

The myofascial release technique (MRT) was applied in the participants' second menstrual cycles. The treatment program consisting of MRT includes the following applications: anterolateral abdominal wall release; superficial fascia (Camper's, Scarpa's), transvers fascia, extraperitoneal fascia and posterior abdominal wall release; thoracolumbar fascia, and erector spina (Figure 1). The MRT begins with placing the dorsal surface of the fingers/hand on the fascia. Pressure is applied on the soft tissue. Once the restricted layer is felt, the fascia is moved along the surface while in contact with the substrates. The technique is applied for 60-90 s but can be continued until relaxation is felt (13-15). The applications were performed while the individual was lying in the supine

and prone position, respectively, supported by pillows. The application was performed with dry hands.

Data Collection

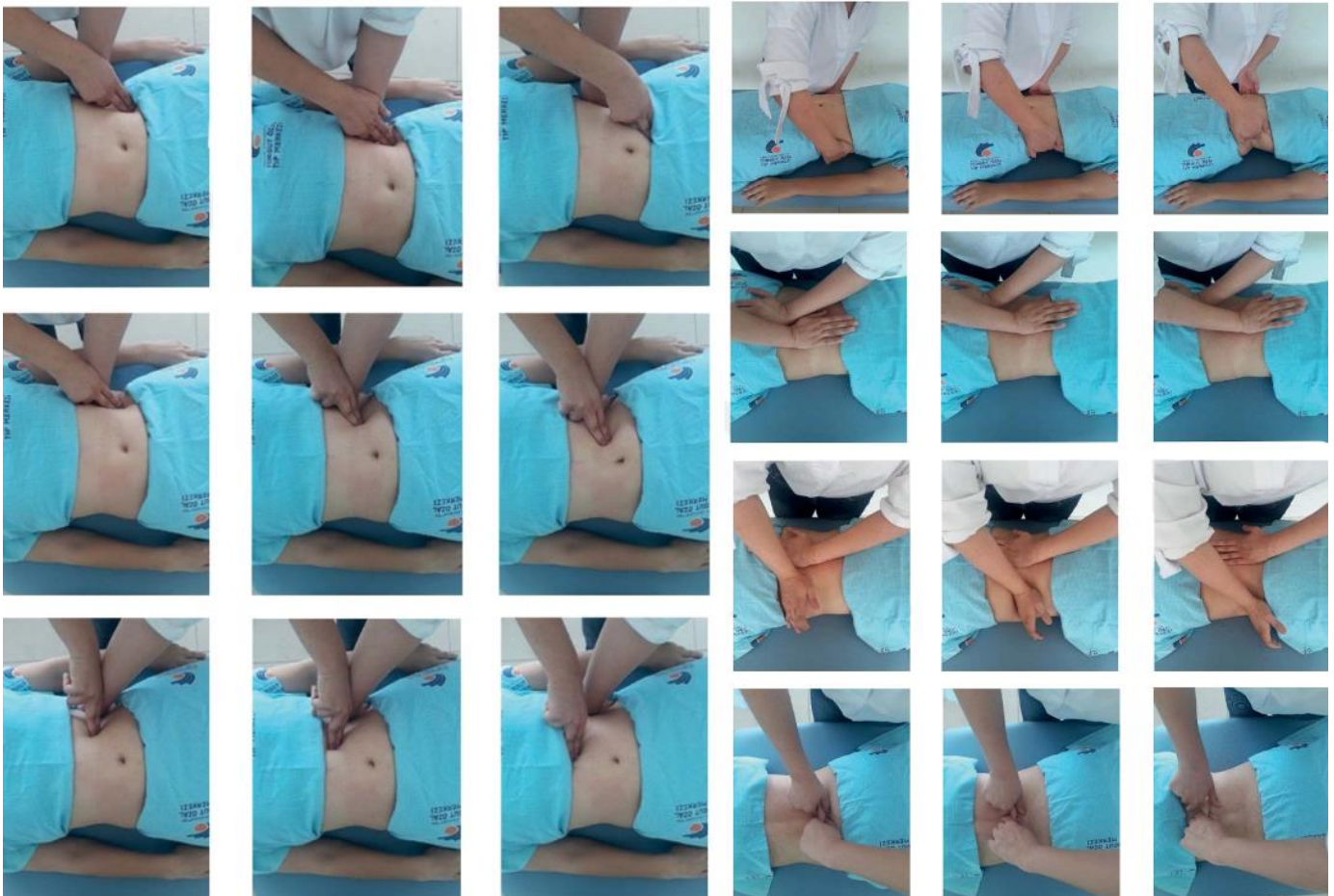
Age, height, weight, smoking, and alcohol habits were recorded. To obtain information about dysmenorrhea, the duration of pain during the menstrual cycle, type, location, intensity of pain and coping methods with pain were recorded. All subjects were evaluated in terms of demographic characteristics and pain on the day of the most intense pain during their first menstrual cycle. They were asked to complete the general health questionnaire in the next day, since it included the evaluation of sleep parameters. The reason for the evaluation in the first menstrual cycle was to obtain information about the pain and general health status of the individuals in the control and experimental groups. To evaluate the subscales of the general health questionnaire correctly, it was thought to be more appropriate to perform a pre-test and post-test. The first evaluation provided control

and increased the reliability of the study. In the second menstrual cycle, the experimental group underwent a treatment program consisting of MRT on the day when the pain was the most intense. The patients in the experimental group were asked to fill in the pain-related sections of the evaluation form immediately after the application, 4 and 8 hours after the application. Immediately after the application, 4 and 8 hours after the menstruation, the pain severity was recorded, and the general health status was evaluated in the next day with the use of the sleep subscale. Individuals in the control group were asked to fill in the evaluation form when the pain started in the day when the pain was the most intense, 4 and 8 hours after the application and the next day.

Assessment of Pain

The Numeric Pain Scale (NPS) was used to determine the severity of pain in dysmenorrhea. The NPS is used to quantify values that cannot be measured numerically.

Figure 1. Anterior and posterior abdominal wall release



The patient is asked to rate her current severity of pain between the score of 0 and 10. The advantage of the test is easy to apply. The NPS has been used for the scientific and clinical purposes for a long time and it is accepted that the NPS has sufficient reliability (16).

Assessment of General Health Status

The General Health Questionnaire (GHQ) is a scale consisting of sixty questions used to determine mental illness in primary care (17). The scale developed by Goldberg was adapted into Turkish by Kılıç in 1996. Short forms of the scale consisting of 30, 28 and 12 questions were developed over time and found to be reliable. In this study, the short form of GHQ consisting of 28 questions was used (18). The GHQ is a scale filled in by the patient and the patient is asked to select the option which nearly defines her. There are 4 answer options for each question. These options are "never", "as often as usual", "more often than usual", and "very often". There are two types of scoring methods. Scoring can be done in the form of Likert scale (0-1-2-3) and in the form developed by Goldberg for GHQ (0-0-1-1) as recommended in the GHQ manual. In this study, scoring with the Goldberg method was preferred. In the evaluation of the scores of the scale, scores of 2 and below indicate the absence of psychopathology (17).

Sample Size

The population of the study consisted of students studying at Inonu University Faculty of Health Sciences between the data collection dates. The sample; individuals who met the inclusion criteria were selected from the relevant population

by probabilistic simple random sampling method. For the simple random sampling method, students with dysmenorrhea were listed and numbered, and the patients to be included in the sample were selected using a random numbers table. In the power analysis, with $\alpha=0.05$ and $1-\beta$ (power) =0.80, it was calculated that at least 80 individuals, 40 experimental and 40 control, should be included. NCSS PASS 13 program was used to calculate the sample size (19).

Data Analyses

Data were analysed electronically. Descriptive statistics were presented as mean \pm standard deviation and/or number (percentage). The Fisher's exact test was used for the evaluation of categorical variables. The conformity of the variables to normal distribution was analyzed using the visual (histogram and probability graphs) and analytical methods (Kolmogorov Smirnov Test). Since the data showed normal distribution because of the analyses, independent sample t test for between-groups comparison and paired sample t test for within-groups comparisons were used. The significance level was set as 0.05.

RESULTS

The 80 individuals included in the study were randomly grouped as 40 in the experimental group and 40 in the control group. The distribution of demographic characteristics between the groups is shown in Table 1. The age, BMI, the day of the most intense pain and the type of pain were similar in the experimental and control groups ($p>0.05$) (Table 1).

Table 1. Comparison of demographic characteristics of the groups.

	MRT Group	Control Group	Total	p
Age (year)	21.12 \pm 1.60	21.22 \pm 1.73	21.17 \pm 1.65	0.85 ^a
BMI (kg/m²)	21.6 \pm 2.26	21.33 \pm 2.67	21.47 \pm 2.46	0.42 ^a
Most painful day	First day	17	17	0.79 ^b
	First 2-3 days	22	21	
	Throughout the period	1	1	
	Other	0	1	
Type of pain	Constantly	19	18	0.82 ^b
	Intermittent	21	22	

Data were presented as mean \pm standard deviation or number; BMI: Body Mass Index; MRT: Myofascial releasing techniques.

Assessment of Pain

The mean values of the severity of pain at the onset, four hours, and eight hours after the first and second menstrual cycles within and between groups are presented in Table 2. While there was no difference between the groups in pain values at the onset of pain, 4 and 8 hours after the first menstrual cycle ($p>0.05$), there was a significant difference in the severity of pain 4 and 8 hours after the second menstrual cycle ($p<0.05$). In the second menstrual cycle, the mean severity of pain of the patients in the experimental group at the 4 and 8 hours after the application were less than the mean severity of pain values of the patients in the control group ($p<0.05$).

When the pain levels recorded at the onset of pain in the first and second menstrual cycles were compared within the groups, no difference was found in both groups ($p>0.05$).

When the severity of pain at the 4 and 8 hours after the application were compared, there was a significant difference; in the experimental group, there was a significant decrease in the second menstrual cycle ($p<0.05$), while there was no difference in the control group ($p>0.05$).

General Health Assessment

Table 3 shows the GHQ total score and 4 subscales of somatic, sleep, social and depression scores in the first and second menstrual cycles within and between the groups. When the GHQ scores in the first and second menstrual cycles were compared between the groups, no difference was

found between the groups in the total score and the scores of the 4 subscales in the first menstrual cycle ($p>0.05$).

In the second menstrual cycle, a significant difference was found in the total score, sleep, social and depression subscales ($p<0.05$). There was no significant difference in the somatic subscale in the second menstrual cycle (Table 3). When the first and second menstrual cycle scores were evaluated within the groups, a significant difference was found in the total score, sleep, and depression subscales of the GHQ questionnaire in the experimental group ($p<0.05$), while the difference was not significant in the somatic and social scales. In the control group, when the total score, somatic, sleep, social and depression subscales of the GHQ questionnaire were analyzed, no significant difference was found between the first and second menstrual cycle scores (Table 3).

DISCUSSION

The MRT applied to individuals with primary dysmenorrhea was found to be positively effective in reducing the severity of pain, improving sleep quality, increasing social activities and depression. In our study, the pain level recorded at the onset of pain in the first and second menstrual cycles of individuals with primary dysmenorrhea was similar. There was a significant decrease in the pain level of the experimental group 4 and 8 hours after the MRT application in the second menstrual cycle, while there was no significant difference in the pain level of the control group.

Table 2. Comparison of pain values within and between groups

		MRT Group	Control Group	p
At baseline	1 st menstrual cycle	6±2.43	6.05±2.38	0.93 ^a
	2 nd menstrual cycle	6±1.97	6.05±1.98	0.91 ^a
	p	1.00 ^b	1.00 ^b	
4 hours after the application	1 st menstrual cycle	5.92±1.5	5.77±1.98	0.70 ^a
	2 nd menstrual cycle	4.1±1.48	5.92±1.81	0.00 ^a
	p	0.00 ^b	0.55 ^b	
8 hours after the application	1 st menstrual cycle	5.45±1.67	4.67±2.76	0.13 ^a
	2 nd menstrual cycle	2.6±1.51	4.95±2.85	0.00 ^a
	p	0.00 ^b	0.18 ^b	

a: Independent group t-test, b: Paired sample t-test; MRT: Myofascial releasing techniques.

In a case report in which MRT was applied to an individual with dysmenorrhea, the menstrual symptoms of the individual were examined. In the study, pain was not specifically evaluated, and a pain diary was asked to be kept based on the scale used. Not only fascial manipulation was applied to the case, but also different treatments to increase circulation and provide relaxation were added. Although it was a single case, not only fascial manipulation was applied and no specific pain assessment was performed, it was reported that menstrual pain decreased significantly during the therapy session (20). However, the fact that other treatments were also applied in this study obscured the effectiveness of MRT. In our study, it was found that pain decreased significantly at the end of 4 and 8 hours in the MRT group. The reason for this decrease may be that oxygenation and nutrition occur more efficiently with the stimulation of fascia. Fascia is a connective tissue that exhibits thixotropic behavior; it is more fluid or soft when manipulated and stiff when immobilized. Movement, body heat, stretching and MRT soften the fascia, making it more flexible and excitable. However, the fascia also slightly increases the temperature and energy level. This increased energy provides a more fluid ground for nutrients, oxygen and cellular wastes (21). Even if it is not possible to resolve all adhesions and tensions in the fascia at the end of a single application, we think that the increase in circulation is effective in reducing pain. chronic pelvic pain syndrome, it

was reported that dysmenorrhea was associated with chronic pelvic pain syndrome between 41-80% (22).

In a 2011 epidemiological study by Zondervan et al. on The most basic causes of chronic pelvic pain syndrome are endometriosis, chronic pelvic inflammation, and adhesions. Trauma, posture, or inflammation cause adhesions in the fascia. It can be said that chronic pelvic inflammation causes fascial adhesions with chronic pelvic pain syndrome. These adhesions can result in abnormal pressure on nerves, muscles, bones, and organs. This pressure may manifest itself with pain or dysfunction in the body and may sometimes cause symptoms that seem to be unrelated (23). Anderson et al. applied MRT and trigger point relaxation in their study on individuals with chronic pelvic pain. As a result of the study, it was reported that pain was significantly reduced (24). In our study, a significant decrease in pain was noted because of MRT applied for primary dysmenorrhea. It can be thought that any trauma or dysfunction of the fascia creates an environment for poor cellular activity, necrosis, disease, pain and dysfunction, and this fascial dysfunction in the pelvis causes pain.

Van Hemert et al. questioned the validity of the GHQ-28 on the grounds that the addition of somatic subscale items would reduce the discriminatory ability of the questionnaire.

Table 3. Comparison of general health questionnaire scores within and between groups

	GHQ	MRT Group	Control Group	p
Somatic	1 st menstrual cycle	3.32±1.92	3.45±1.39	0.74 ^a
	2 nd menstrual cycle	3.07±1.57	3.42±1.44	0.31 ^a
	p	0.12 ^b	0.82 ^b	
Sleep	1 st menstrual cycle	3.35±2.05	3.4±1.75	0.91 ^a
	2 nd menstrual cycle	2.82±1.67	3.62±1.74	0.04 ^a
	p	0.02 ^b	0.21 ^b	
Social	1 st menstrual cycle	2.20±1.71	2.87±1.69	0.08 ^a
	2 nd menstrual cycle	1.75±1.58	2.9±1.76	0.00 ^a
	p	0.09 ^b	0.87 ^b	
Depression	1 st menstrual cycle	2.15±1.54	1.92±1.71	0.54 ^a
	2 nd menstrual cycle	1.17±1.37	2.00±1.64	0.02 ^a
	p	0.00 ^b	0.61 ^b	
Total Score	1 st menstrual cycle	11.02±5.27	11.65±5.18	0.59 ^a
	2 nd menstrual cycle	8.82±4.6	11.95±5.32	0.01 ^a
	p	0.00 ^b	0.33 ^b	

a: Independent group t-test, b: Paired t-test; GHQ: General Health Questionnaire, MRT: Myofascial releasing techniques.

They argued that the somatic subscale questions may elicit positive responses in the presence of any physical illness or psychological disorder. To support their claims, they showed that the validity coefficients of the somatic subscale were lower than those of the other 3 subscales (25). In our study, no significant change was observed in the somatic subscale of the GHQ. The fact that the questions were mainly focused on headache and nausea and were incomplete in terms of investigating dysmenorrhea symptoms may be effective in this situation.

Sleep is one of the most important functions of the central nervous system. Studies have shown that sleep deprivation, especially during REM sleep, increases the sensation of pain, and pain disrupts normal sleep patterns. This creates a vicious cycle between pain and sleep. It has been reported that back and abdominal pain due to dysmenorrhea negatively affects sleep and disrupts daily sleep patterns (26). In our study, we found that MRI had a positive effect on sleep and was effective in reducing pain in women with dysmenorrhea. We believe that this improvement in sleep may be related to the reduction in pain.

Studies have shown that menstrual pain has a negative impact on an individual's social life (27, 28). Potur et al. reported that the level of pain in dysmenorrhea was highly related to social activity/function (29). In our study, no significant increase in social relationships was found in individuals with primary dysmenorrhea who underwent MRT, but a significant difference was found when the two groups were compared. We believe that the reason for this may be that MRT may have increased oxytocin and AVP levels.

There are no studies in the literature that have investigated the effect of MRT on depression in individuals with primary dysmenorrhea. Chambers et al. found that the increase in vagal tone was effective in reducing the level of depression (30). There is a study by Henley et al. that examined the effect of MRT on autonomic nervous system activity. According to the results of this study, MRT application produces enough vagal stimulation to exceed sympathetic tone (31). In addition, massage therapy is known to increase dopamine and serotonin levels (32). In our study, MRT was found to be effective in reducing depression levels in women with

primary dysmenorrhea. We believe that the reason for this reduction may be the decrease in pain, decrease in abnormal sympathetic nerve activation, increase in vagal tone, and increase in dopamine and serotonin levels with MRT.

Limitations

Considering the limitations of our study, the study was conducted on university students with primary dysmenorrhea and there were difficulties in determining the most painful days of the students and ensuring that they applied on those days. Our study evaluated the acute effects of MRT applied to the abdominal and thoracolumbar regions in a single session for primary dysmenorrhea. It has limitations in terms of evaluating the effects of MRT. In our study, the effects of MRI on pain and general health were evaluated. The evaluation of menstrual symptoms was found to be inadequate.

CONCLUSION

As a result of this study, it was found that MRT had positive effects on pain and general health in primary dysmenorrhea. We believe that MRT applied to individuals with primary dysmenorrhea in the clinic can prevent the loss of school and work hours of women, reduce social isolation during menstruation, and improve the quality of sleep of individuals. We believe that scientific studies to be conducted in the light of this study may bring a new perspective to the treatment of primary dysmenorrhea.

Author Contribution

Aybüke Fanuscu: Conceptualization, Methodology, Formal Analysis, Investigation, Writing-Original Draft

Burcu Talu: Conceptualization, Writing-Review & Editing, Supervision

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