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INVESTIGATION OF THE EFFECT OF AN ONLINE YOGA-BASED EXERCISE PROGRAM ON WOMEN WITH PRIMARY DYSMENORRHEA: A RANDOMIZED CONTROLLED TRIAL

ORIGINAL ARTICLE

ABSTRACT

Purpose: It was aimed to investigate the effects of telerehabilitation method and online yoga-based exercise program on pain, menstrual attitude, body awareness and quality of life in women with primary dysmenorrhea (PD).

Methods: This study is an experimental randomized controlled single-blind study. Fifty women (25 in the intervention group, and 25 in the control group) between the ages of 18-35 were included in the study. At the beginning of the study, both groups were given informational training on PD and treatment methods. In addition to informational training, an online yoga-based exercise program was applied individually to the intervention group, twice a week for 8 weeks, for a total of 16 sessions. Visual analog scale (VAS), menstrual attitude scale (MAS), body awareness questionnaire (BAQ), short form-36 (SF-36), and satisfaction questionnaire were used for data collection.

Results: The VAS score of the intervention group decreased from 6.76 to 3.76 points. VAS ($p<0.001$), MAS ($p<0.001$), BAQ ($p<0.001$), and SF-36 ($p<0.05$) questionnaire scores in the intervention group were found to be significant compared to the control group. While VAS scores increased significantly ($p<0.001$) in the control group, no change was observed in MAS ($p=0.791$) and BAQ ($p=0.174$) scores. In SF-36, improvement was observed only in social functionality ($p=0.050$), pain ($p=0.002$) and general health ($p=0.004$).

Conclusion: The results of this study showed that the online yoga-based exercise program had a positive effect on pain, menstrual attitude, body awareness and quality of life in PD.

Keywords: Dysmenorrhea, Exercise, Pain, Telerehabilitation, Yoga

ÇEVRİMİÇİ YOGA TEMELLİ EGZERSİZ PROGRAMININ PRİMER DİSMENORELİ KADINLARDA ETKİSİNİN ARAŞTIRILMASI: RANDOMİZE KONTROLLÜ ÇALIŞMA

ARAŞTIRMA MAKALESİ

ÖZ

Amaç: Bu çalışmada primer dismenoreli (PD) kadınlarda çevrimiçi yoga temelli egzersiz programının ağrı, menstrual tutum, beden farkındalığı ve yaşam kalitesi üzerine etkisinin araştırılması amaçlanmıştır.

Yöntem: Bu çalışma deneysel, randomize kontrollü, tek kör bir çalışmadır. Çalışmaya 18-35 yaş arası 50 kadın (müdahale grubunda 25, kontrol grubunda 25) dahil edildi. Çalışmanın başında her iki gruba da PD ve tedavi yöntemleri hakkında bilgilendirme eğitimi verildi. Müdahale grubuna bilgilendirme eğitimine ilave olarak, haftada iki kez, 8 hafta boyunca toplam 16 seans bireysel olarak çevrimiçi yoga temelli egzersiz programı uygulandı. Verilerin toplanmasında Görsel Analog Ölçeği (GAS), Menstruasyon Tutum Ölçeği (MTÖ), Vücut Farkındalığı Anketi (VFA), Kısa Form-36 (SF-36) Anketi ve Memnuniyet Anketi kullanıldı.

Sonuçlar: Müdahale grubunun GAS puanı 6,76›dan 3,76›ya düştü. Müdahale grubundaki GAS ($p<0,001$), MTÖ ($p<0,001$), VFA ($p<0,001$) ve SF-36 ($p<0,05$) anket puanları kontrol grubuna göre anlamlı bulundu. Kontrol grubunda GAS puanı anlamlı derecede artarken ($p<0,001$), MTÖ ($p=0,791$) ve VFA ($p=0,174$) puanlarında herhangi bir değişiklik gözlenmedi. SF-36'da ise sadece sosyal işlevsellik ($p=0,05$), ağrıda ($p=0,002$) ve genel sağlıkta ($p=0,004$) iyileşme gözlendi.

Tartışma: Bu çalışmanın sonuçları çevrimiçi yoga temelli egzersiz programının PD'de ağrı, menstrual tutum, vücut farkındalığı ve yaşam kalitesi üzerinde olumlu etkisinin olduğunu gösterdi.

Anahtar Kelimeler: Ağrı, Dismenore, Egzersiz, Telerehabilitasyon, Yoga

INTRODUCTION

Primary dysmenorrhea (PD) is defined as painful cramps without any diagnosed pelvic pathology (1,2). This situation causes a serious decrease in women's quality of life and most of the women do not demand any health care services (3).

In the treatment of PD, individuals often prefer non-prescription pharmacological agents, and try various approaches such as physiotherapy, exercise, psychotherapy, and aromatherapy (4,5). Although PD is a common problem, it is perceived as normal by most women. It has been reported that the frequency of consulting a doctor due to dysmenorrhea varies between 7.1 and 32.6%, and the rate of over-the-counter drug use varies between 70-82%. However, drug therapy can also cause side effects such as headache, gastrointestinal problems, and heart attack (6,7).

Exercise is an important application that increases the secretion of beta-endorphin hormone, which has a natural pain reliever effect in the body, and reduces stress, pain and prostaglandin levels (8). Although the effectiveness of exercise practices in reducing the symptoms of PD has been proven, there is a need to improve its routine application in PD and other gynecological problems (9). Telerehabilitation is the ability to provide rehabilitation remotely using electronic information and communication technologies. Telerehabilitation facilitates access to both patients' rehabilitation services and researchers' access to individuals (10). A study investigating the effects of tele-yoga practice on chronic pain reported that the practice improved both physical and psychological aspects of individuals and reduced the stress load with its motivation-increasing feature (11). Due to the limited number of studies in the literature investigating exercise-oriented telerehabilitation in the treatment of PD, this study aimed to investigate the effect of an online yoga-based exercise program in women with PD.

METHODS

Study design and participants

The protocol of the study was approved by Istanbul Medipol University Non-Interventional Clinical Research Ethics Committee (Meeting date: 22/10/2021, Decision No. 10840098-772.02-E.60605). This study was registered at the Clinical.Trials.gov Protocol Registration and Results System (Protocol ID Number NCT05081869).

This study was performed in line with the principles of the Declaration of Helsinki in participants' own settings and online between November 2020 and February 2021. An informative consent form and explanations that the participation was voluntary and they had the freedom to withdraw from the study were added to the online questionnaire for the participants. Written consent was obtained from all participants before the study.

Participants were informed that they would be evaluated on the first day of their menstrual cycle. Participants who met the inclusion criteria were randomized in a 1:1 ratio via closed-envelope method to receive either intervention or control groups. Evaluation (G.A.B.) and treatment (Y.S.) were performed by two different physiotherapists. The physiotherapist who made the evaluations was blind in knowing which group the patients belonged to.

In the current study included women who applied to us with the complaint of PD, had a regular menstrual cycle (28±7 days), aged 18-35, and had a menstrual visual analog scale score higher than 4 cm in the last 6 months (12). Those who had a history of birth or current pregnancy, had undergone pelvic surgery, had a history of secondary dysmenorrhea, used an intrauterine device, and used oral contraceptives or antidepressant derivatives at least 6 months before the study were excluded from the study (13). Individuals were followed over three menstrual cycles (9, 14, 15). In total, 58 people were evaluated. 2 people from the intervention group and 4 people from the control group were excluded from the study because they did not meet the inclusion criteria. Two people from the intervention group dropped out of the study because they refused to participate in the study. Fifty women who met the inclusion criteria and agreed to participate

in the study were divided into two groups as intervention (n=25) and control (n=25) (Figure 1).

Measurements

Participants' personal and menstrual period information "sociodemographic information form", pain intensity "visual analog scale (VAS)", menstruation attitudes "menstruation attitude scale (MAS)", body awareness "body awareness questionnaire (BAQ)", quality of life was evaluated with ''short form-36 (SF-36)'' and treatment satisfaction with ''satisfaction scale''. Evaluations were repeated by the same physiotherapist, blinded to group distribution, at the start of the study (based) and for two consecutive menstrual periods (first and second measurements), on the first day of the cycle. All assessments were administered individually online.

All participants filled out a sociodemographic information form in which information such as age, height, weight, educational status, medication use, family history, previous surgery, exercise habits, age at menarche, menstrual pattern, pain, treatment methods used, accompanying physical and mental symptoms, number of absenteeism at school or work (days) was questioned.

Visual analog scale (VAS) used to measure participants' pain levels. The level of pain was requested to be scored between 0-10 (0=No pain at all, 10=The most severe pain). It was developed by Bryant in 1993 and was adapted into Turkish by Aydin et al (16,17).

Menstruation attitude scale (MAS) is a scale consisting of 5 categories and 33 sub-items. Each item is scored between 1 (strongly disagree) and 5 (strongly agree). A high score on the scale indicates a "positive" attitude towards menstruation. MAS was developed by Brooks-Gunn and, Ruble in 1980 and was validated in Turkish by Kulakaç et al (18, 19).

Body awareness questionnaire (BAQ) consists of 18 questions in total. Each question is scored from 1 (Not at all true for me) to 7 (Totally true for me). A high score on the questionnaire means high body awareness. BAQ was developed by Shields et al. in 1989 and was validated in Turkish by Karaca (20, 21).

The Short Form-36 questionnaire (SF-36) was used to assess the participants' quality of life. The questionnaire has 36 questions and 8 subscales. The answers to the questions are scored between 0 (low) and 100 (high). SF-36 was developed by Ware and Sherbourne in 1992 and was validated in Turkish by Kocyigit et al (22, 23).

The treatment satisfaction of the participants in the intervention group was evaluated with 3 questions. Q1: Rate your satisfaction with the program on a scale of 1-10. Q2: Rate your level of recommending this treatment protocol to another woman with the same complaint as you, on a scale of 1-10. Q3: Which of the face-to-face and online treatment options do you prefer?"

Interventions

At the beginning of the study, both groups were given informational training on PD and treatment methods. Participants in the control group at the beginning of the study; 20-minute informational training including the female reproductive system organs, the structure of the pelvis, the position and functions of the pelvic floor muscles, the definition and physiology of menstruation, the types and risk factors of dysmenorrhea, the definition and symptoms of PD, the treatment methods for coping with the pain in PD, online given individually. This intervention was made once.

In addition to the information training, the intervention group implemented a 50-minute online yoga-based exercise program consisting of 5 categories (14, 15). The exercise program continued twice a week for a total of 8 weeks. The created online exercise program was implemented in the individuals' own environments, online and individually.

In the first category of the 5-category exercise program, yoga poses were performed to stretch the iliopsoas, hamstring, adductor group, tensor fascia lata and iliotibial band, piriformis, quadratus lumborum, quadriceps femoris, plantar fascia and gastrocnemius muscles associated with the pelvic region. Stretching for 20-30 seconds was

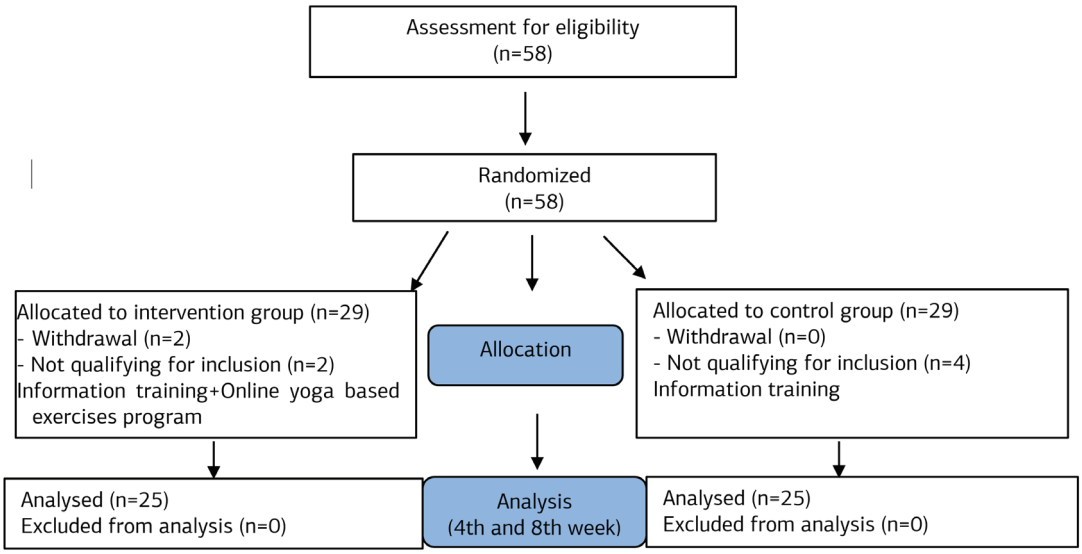

Figure 1. Flow Diagram of the Study

applied in each yoga pose. In the second category, stabilization and pelvic mobilization exercises for internal and external core muscles were applied. Each exercise was performed in 3 sets of 10 repetitions. In the third category, strengthening exercises were performed on the hip and surrounding muscle groups (gluteus maximus, gluteus medius), abdominal muscles (rectus abdominis, internal and external oblique muscles), erector spinae muscle group, quadriceps femoris and latissimus dorsi muscles. Each exercise was performed as 10 repetitions, 3 sets. In the fourth category, the correct activation pattern of the pelvic floor muscles was taught. Then, gradually supine, bridge, sitting position and standing kegel exercises were repeated 10 times in the form of fast and slow contractions (starting with 5 seconds and progressing according to the endurance of the person). The exercises were performed in 3 sets, with a rest period of 10 seconds between each set. In the fifth category, the participants performed two-minute diaphragmatic breathing in five different relaxation positions.

Statistical analysis

The G*Power (3.1 software) program was used to determine the number of participants. When the results of two studies similar to current study were evaluated in the literature review, it was found that the Effect size d value for the VAS score was between 0.17 and 2.06 and clustered around (15, 24). When effect size d=1, α=0.05, power (1-β)=0.90 (90%) were taken in the G power program, it was determined that the minimum sample size was 46 people, 23 in each group. Considering the possible data loss, it was decided to include a total of 50 people (25 people in each group) for the study.

Statistical analyses were performed using IBM SPSS Statistical Software (IBM Corporation, Armonk, New York) version 23. Compliance analyzes of numerical type variables (counted, measured) with normal distribution were evaluated using the Kolmogrow-Smirnov test. The relationships between categorical variables and groups were examined using the Chi-square test. In the conditions where parametric test assumptions were met, t-test was used to compare two independent groups, and ANOVA test was used for comparisons between groups. In the conditions where parametric test conditions were not met, Mann-Whitney U test was used for comparison of two independent groups, and Kruskal-Wallis analysis was used for comparisons between groups. The Mann-Whitney U test was used to compare the groups in the VAS scale, and the Friedman test was used to compare the periods. Test of variance was used for group and period comparisons in MAS, BAQ and SF-36 question-

Table 1. The Sociodemographic and Menstrual Period Characteristics of the Participants

		Intervention Group (n=25)		Control Group (n=25)		
		$\bar{x}$	SD	$\bar{x}$	SD	p*
Age (year)		23.9	2.3	24.2	2.9	0.906[a]
BMI (kg/ $m^{2)}$		21.04	2.61	22.02	3.75	0.287[b]
		n	%	n	%	p*
Education	High school	1	4.0	4	16.0	0.157[c]
	University	24	96.0	21	84.0	
Exercise routine	Yes	9	36.0	9	36.0	1.000[c]
	No	16	64.0	16	64.0	
Menarch age	≤13 year	7	28.0	10	40.0	0.370[c]
	>13 year	18	72.0	15	60.0	
Positive family history of PD in mother or sister	Yes	12	48.0	17	68.0	0.152[c]
	No	13	52.0	8	32.0	
Use of pain medication for the management of PD symptoms	Yes	9	36.0	13	52.0	0.254[c]
	No	16	64.0	12	48.0	
Number of absences from school or work due to PD	Yes	11	44.0	16	64.0	0.156[c]
	No	16	64.0	12	48.0	

*Statistical significance level p<0.05; $\bar{x}$: Arithmetic Mean; S.D: Standard Deviation; BMI: Body mass index; , PD: primary dysmenorrhea. a: Man Whitney U Test, b: T Test, c: Chi-square test

naires. P<0.05 was accepted as a statistical significance level.

RESULTS

Table 1 shows the sociodemographic characteristics of the participants. At the beginning, there was no difference between the sociodemographic and menstrual characteristics of the participants in the control and intervention groups (p>0.05).

There was no difference between groups in pretreatment pain severity scores (p=0.499). While the pain scores of the intervention group decreased significantly during the periods in the in-group comparison (p<0.001), an increase was observed in the within-group evaluation of the control group (p=0.001). In the first and second measurements after the treatment, the pain intensity of the intervention group was found to be significantly lower than the control group (p<0.001). In the comparison between groups; the program applied to the intervention group was found to be more effective in reducing the severity of pain compared to the control group (Table 2).

There was no difference between the groups in the pretreatment MAS scores (p=0.781). An increase was noted between the first and second measurement after the treatment in the within-group analysis scores of the intervention group (p=0.42). The scores of the intervention group were higher than the control group in the second period (p=0.030). It was found that the treatment applied in the intervention group had a positive effect on menstruation attitude and behavior compared to the control group (p=0.030) (Table 3).

There was no difference between groups in pretreatment BAQ (p=0.652). The increase in the within-group comparison scores of the intervention group, both between the baseline and the first measurement (p=0.009) and between the first and second measurement, was statistically significant (p=0.007). When the evaluation results in the intervention and, control groups

Table 2. The Variation of VAS Scores within and between Groups

	Intervention group		Control group		
	$\bar{x}$ (95% CI)	SD	$\bar{x}$ (95% CI)	SD	P** (ES)
VAS					
Based	6.76 (6.28-7.24)	1.165	6.52 (6.09-6.95)	1.046	0.499 (0.21)
P.T-1st	4.72 (4.30-5.14)	1.021	6.48 (5.89-7.07)	1.418	**<0.001** (1.42)
P.T-2nd	3.76 (3.21-4.31)	1.332	7.20 (6.63-7.77)	1.384	**<0.001** (2.56)
P*	**<0.001**		**0.001**		

Statistical significance level p<0.05; $\bar{x}$ Arithmetic Mean; S.D: Standard Deviation, VAS: Visual analog scale, ES: Effect size. Based: pretreatment measurement; P.T-1st: First measurement after treatment (4. week), P.T-2nd: Second measurement after treatment (8. week)

P*: Friedman test (In-group assessment), P**: Mann-Whitney U test (Assesment between groups)

were compared, it was found that the 8-week online exercise program had a positive effect on increasing the body awareness of the individuals from the first month (p<0.001), (Table 3).

Quality of life scores before treatment were similar in both groups (p>0.05). Eight sub-headings of the SF-36 questionnaire were analyzed separately. Significant improvements were de-

Table 3. The Time-Dependent Variation of MAS and BAQ Scores within and between Groups

	Intervention group		Control group		
	$\bar{x}$ (95% CI)	SD	$\bar{x}$ (95% CI)	SD	P** (ES)
MAS					
Based	92.48 (88.49-96.47)	9.67	93.28 (88.94-97.62)	10.52	0.781 (0.07)
P.T-1st	94.40 (90.32-98.48)	9.87	92.24 (88.25-96.23)	9.68	0.438 (0.22)
P.T-2nd	97.56 (94.35-100.77)	7.78	91.20 (86.29-96.11)	11.90	**0.030** (0.63)
$*P_{B-1}$	0.202		0.692		
$*P_{B-2}$	**<0.001**		0.225		
$*P_{1-2}$	**0.042**		0.791		
BAQ					
Based	90.36 (86.12-94.60)	10.27	92.12 (85.33-98.91)	16.45	0.652 (0.12)
P.T-1st	93.44 (89.57-97.31)	9.39	93.48 (87.43-99.53)	14.65	0.991 (0.003)
P.T-2nd	96.84 (92.64-101.04)	10.18	91.44 (85.54-97.34)	14.30	0.131 (0.43)
$*P_{B-1}$	**0.009**		0.433		
$*P_{B-2}$	**<0.001**		0.942		
$*P_{1-2}$	**0.007**		0.174		

Statistical significance level p<0.05; $\bar{x}$: Arithmetic Mean; S.D: Standard Deviation, ES: Effect size. MAS: Menstruation attitude scale, BAQ: Body awareness questionnaire. Based: pretreatment measurement, P.T-1st: First measurement after treatment (4. Week), P.T-2nd: Second measurement after treatment (8. Week), P_{B-1}: Based-First measurement (0-4 week), P_{1-2}: First and second measurement (4-8 week), P_{B-2}: Based and second measurement (0-8 week), P*: Repeated Measure ANOVA (In-group assessment), P**: T test (Assesment between groups)

Table 4. The Comparative Evaluation of the Effect of the Interventions on the SF-36 within and between Groups

Sub-titles of the SF-36 questionnaire	Intervention group		Control group		
	$\bar{x}$ (95% CI)	SD	$\bar{x}$ (95% CI)	SD	p** (ES)
Physical Function					
Based	83.40 (79.37-87.43)	9.76	81.40 (75.55-87.25)	14.18	0.564 (0.16)
P.T-1st	90.00 (87.27-92.73)	6.61	82.40 (76.23-88.57)	14.94	**0.024** (0.65)
P.T-2nd	90.80 (87.78-93.82)	7.31	80.40 (74.21-86.59)	14.99	**0.004** (0.88)
$*P_{B-1}$	**<0.001**		0.814		
$*P_{B-2}$	**<0.001**		0.827		
$*P_{1-2}$	0.842		0.192		
Physical Role Difficulties					
Based	51.00 (40.91-61.09)	24.45	48.00 (34.70-61.30)	32.21	0.712 (0.10)
P.T-1st	61.00 (49.82-72.18)	27.08	43.00 (29.18-56.82)	33.48	**0.042** (0.59)
P.T-2nd	78.00 (71.13-84.87)	16.65	45.00 (31.68-58.32)	32.27	**<0.001** (1.28)
$*P_{B-1}$	0.109		0.643		
$*P_{B-2}$	**<0.001**		0.851		
$*P_{1-2}$	**<0.001**		0.920		
Emotional Role Difficulties					
Based	33.30 (20.75-45.85)	30.41	46.65 (28.88-64.41)	43.03	0.211 (0.35)
P.T-1st	50.63 (37.99-63.25)	30.60	42.64 (27.51-57.77)	36.66	0.407 (0.23)
P.T-2nd	66.62 (56.11-77.13)	25.47	41.30 (27.39-55.21)	33.71	**0.004** (0.84)
$*P_{B-1}$	**0.011**		0.863		
$*P_{B-2}$	**<0.001**		0.798		
$*P_{1-2}$	**0.010**		0.992		
Energy					
Based	50.60 (43.80-57.40)	16.48	54.40 (46.62-62.18)	18.84	0.451 (0.21)
P.T-1st	59.80 (54.80-64.80)	12.12	54.80 (46.75-62.85)	19.50	0.282 (0.30)
P.T-2nd	66.00 (59.81-72.19)	15.00	48.80 (39.08-58.52)	23.55	**0.004** (0.87)
$*P_{B-1}$	**0.002**		0.998		
$*P_{B-2}$	**<0.001**		0.228		
$*P_{1-2}$	0.099		0.116		
Mental Health					
Based	61.76 (54.90-68.62)	16.62	63.92 (54.65-73.19)	22.47	0.701 (0.11)

P.T-1st	68.88 (63.43-74.33)	13.19	63.36 (56.01-70.71)	17.80	0.219 (0.35)
P.T-2nd	72.52 (67.71-77.33)	11.65	60.56 (53.24-67.88)	17.73	**0.007** (0.80)
*P_{B-1}	**0.016**		0.994		
*P_{B-2}	**<0.001**		0.456		
*P_{1-2}	0.267		0.490		
Social Functioning					
Based	58.50 (50.65-66.34)	19.01	65.90 (58.86-72.93)	17.05	0.154 (0.40)
P.T-1st t	66.80 (60.36-73.24)	15.59	57.10 (48.73-65.46)	20.27	0.064 (0.53)
P.T-2nd	78.20 (72.46-83.93)	13.89	59.80 (51.89-67.70)	19.15	**<0.001** (1.10)
*P_{B-1}	**<0.001**		**0.010**		
*P_{B-2}	**<0.001**		**0.050**		
*P_{1-2}	**<0.001**		0.491		
Pain					
Based	55.50 (48.85-62.14)	16.11	57.10 (49.42-64.77)	18.59	0.746 (0.09)
P.T-1st t	65.20 (59.03-71.37)	14.95	54.70 (47.69-61.70)	16.98	**0.025** (0.65)
P.T-2nd	76.50 (72.02-80.97)	10.85	48.00 (40.67-55.32)	17.74	**<0.001** (1.93)
*P_{B-1}	**<0.001**		0.373		
*P_{B-2}	**<0.001**		**0.002**		
*P_{1-2}	**<0.001**		**0.023**		
General Health					
Based	71.20 (63.56-78.84)	18.50	70.20 (62.92-77.48)	17.65	0.846 (0.05)
P.T-1st	76.40 (70.08-82.72)	15.31	67.00 (60.42-73.58)	15.94	**0.039** (0.60)
P.T-2nd	83.20 (76.90-89.50)	15.27	63.80 (57.13-70.47)	16.16	**<0.001** (1.23)
*P_{B-1}	**0.005**		0.131		
*P_{B-2}	**<0.001**		**0.004**		
*P_{1-2}	**<0.001**		0.081		

Statistical significance level p<0.05; $\bar{x}$: Arithmetic Mean; S.D: Standard Deviation, ES: Effect size, SF-36: Short form-36, Based: pretreatment measurement, P.T-1st: First measurement after treatment (4. Week), P.T-2nd: Second measurement after treatment (8. Week), P_{B-1}: Based-First measurement (0-4 week), P_{1-2}: First and second measurement (4-8 week), P_{B-2}: Based and second measurement (0-8 week), P*:Repeated Measure ANOVA (In-group assessment), P**: T test (Assesment between groups)

that they would choose the online exercise program, 40% stated that they would prefer face-to-face treatment (Table 5). During the study period, no negative situation was reported verbally from any of the participants.

DISCUSSION

In the study we aimed to investigate the effect of an online yoga-based exercise program on women with PD. Positive developments were obtained in the pain, menstrual attitude, body awareness and quality of life in PD.

Table 5. The Treatment Satisfaction Rates of the Intervention Group

Questions		Intervention Group $\bar{x}$ ±SD
OEP satisfaction (scoring 1-10)		9.04±0.98
Recommending the OEP to someone else (scoring 1-10)		9.24±1.09
Which of the face-to-face and online treatmentoptions do you prefer?"	Online	15 (%60,0)
	Facetoface	10 (%40.0)

$\bar{x}$: Arithmetic Mean; SD: Standard Deviation, OEP: Online Exercise Program

Bavil et al. increasing physical activity can reduce dysmenoric pain (25). Rakhshaee et al. found that three yoga poses were effective in reducing the severity of PD (24). Based on these results, it was concluded that a categorized and versatile exercise program was effective in reducing dysmenoric pain.

Sönmezer and Yosmaoğlu determined that there was a decrease in pain but no change in attitude towards menstruation in PD women who applied connective tissue massage and kinesio taping for 2 weeks (26). In a study in which progressive relaxation exercises were applied; it was concluded that the scores in the menstruation attitude scale's debilitating and disturbing case parameters decreased after the intervention, resulting in an increase in the ability of individuals to cope with pain and a decrease in kinesiophobia thanks to exercise (27). In the current study, while no significant change was observed in menstrual attitude in the first measurement after starting exercise therapy, significant differences were observed in the menstruation attitude scores of individuals at the end of 8 weeks. As a result, it was concluded that a 4-week exercise program may be insufficient to have an effect on menstruation attitude and behavior, and an exercise program of at least 8 weeks should be applied.

Yoga-based exercises improved body awareness in young women (28). Dogan et al. reported that 4-week lifestyle recommendations, relaxation exercises, and kinesio taping program were insufficient to improve body awareness in women with PD (13). In the current study, a significant increase was found in body awareness scores starting from the 4th week. Unlike the literature, it can be stated that interventions such as yoga have a positive effect on both pain and body awareness in achieving positive results in as little as 4 weeks. However, it is clear that the BAQ is not a specific questionnaire for dysmenorrhea, and since current study was conducted during the COVID-19 pandemic, where women were affected both physically and psychologically, a body awareness questionnaire specific to dysmenorrhea is needed.

In the current study, a statistically significant improvement was found in the subheadings of physical function, physical role difficulty, energy, and mental health of the quality of life questionnaire starting from the 4th week and this improvement was maintained until the end of the 8th week. Emotional role difficulty, social functionality, pain and general health scores of the quality of life questionnaire showed a statistically positive improvement from the beginning and this development continued increasingly until the end of the 8th week. In a study investigating the effects of 12-week yoga practice on the quality of life of women with PD without a sports background, statistically significant improvements were found in the intervention group in the areas of physical function, vitality, mental health, social functionality, and pain of the SF-36 questionnaire (15). It is known that the level of pain in PD directly affects the quality of life of individuals. It is thought that the significant decrease in VAS scores in the intervention group contributed to the improvement of the SF-36 questionnaire scores, which included both physical, emotional and daily life questions.

A significant reduction in pain has been achieved with the application of telerehabilitation in pel-

vic girdle pain associated with pregnancy (29). It has been reported that tele-yoga practice in chronic pain contributes to both physical and psychological recovery of individuals (11). In the current study, the satisfaction rate from the online yoga-based exercise program is quite high, and the fact that the selection rates between online and face-to-face treatment are close to each other means that the concept of telerehabilitation is still open to development. The limitations of the study include the fact that no face-to-face evaluation was made with the participants, the treatment period was limited to 8 weeks, and the lack of reliable communication over the internet at some points.

This study, it has been shown that the online yoga-based exercise program has positive effects on pain, menstrual attitude, body awareness in PD and increases the quality of life of women. In the treatment of PD, creating an exercise program based on methods that improve both physical and mental health, such as yoga, and delivering it to people by combining it with technological developments can be an effective and sustainable solution method in the long run. Future studies, with a longer follow-up period, need to focus on the limitations of telerehabilitation, increase alternative data collection methods, and improve the routine application of online exercise programs by physiotherapists in PD and other gynecological problems.

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