

Effects of Dry Figs on Primary Dysmenorrhea Symptoms, perceived Stress Levels and the Quality of Life

Keziban Amanak

Objective: The aim of this study was to examine the effects of eating dried figs on the symptoms of primary dysmenorrhea, perceived stress levels, and quality of life during all menstrual cycles.

Methods: This randomized, placebo-controlled study was performed with 115 midwifery students. Each student was randomly assigned to the placebo (n = 31), cinnamon (n = 33), or dried fig (n = 34) groups. Data were gathered through the Total Dysmenorrhea Score, a descriptive information form, the Visual Analogue Scale, a pain duration assessment form, the Menstrual Distress Questionnaire, the Perceived Stress Scale, and the short version of the World Health Organization Quality of Life Scale-TR.

Results: During the 3 menstrual cycles in which the intervention was implemented, the dried-fig group had significantly lower scores for pain severity and duration, menstrual distress, and perceived stress than did those of the cinnamon and placebo groups. In addition, during these 3 cycles, the dried-fig group had significantly higher quality-of-life scores than the cinnamon and placebo groups.

Conclusion: The results showed that eating dried figs during menstruation decreased pain severity and duration, menstrual symptoms, and perceived stress and increased quality of life. [*PR Health Sci J* 2020;39:319-326]

Key words: Complementary therapies, Dysmenorrhea, Herbal medicine, Pain

Primary dysmenorrhea is a serious health problem affecting women in the reproductive age and considerably decreasing their quality of life. According to reports, 80 to 99% of the women who suffer from primary dysmenorrhea experience impairment of their daily lives, decreases in their efficiency in school or work (or both), job loss, or a combination of any 2 or all 3 of the previous (1-4). In fact, the annual loss attributed to dysmenorrhea in the USA is 600,000,000 work hours and \$2,000,000 (5,6). In addition, in a study in Canada that included 934 women over 18 years old with dysmenorrhea, 60% of the women had moderate to severe pain, 50% had restricted daily lives, and 17% could not go to school or work due to dysmenorrhea (7). Currently, there is an increased tendency to utilize alternative or complementary (or both) medicine for the treatment of dysmenorrhea.

It has been noted in several studies that eating dried figs has a positive effect on various types of pain (8-12). In Turkey, eating dried figs is traditionally known to alleviate pain (13,14). Although it has been reported in the literature that primary dysmenorrhea can be treated with many alternative and complementary treatment methods, there have not been any studies about eating dried figs for the treatment of this condition. Therefore, this study was performed to examine the effects of eating dried figs on the symptoms of primary dysmenorrhea, perceived stress levels, and quality of life.

Materials and Methods

This was a randomized, placebo-controlled study and was performed with midwifery students at the Health Sciences Faculty of Adnan Menderes University from 15 September 2018 through 15 March 2019. The study included 115 students, of which 31 were assigned to the placebo group, 33 to the cinnamon group, and 34 to the dried-fig group. The lowest number of students that could be included in the study was determined based on data from a study by Jaafarpour et al. (2015) (15); our study had a confidence interval of 95% ($\alpha = 0.05$) and a power of 0.80 (80%). Each group, then, comprised 13 individuals. To achieve this sample size, 360 students from the Midwifery Department were screened for dysmenorrhea. Students having a total dysmenorrhea score higher than 3 were considered as having dysmenorrhea (16,17); thus, 230 students were invited to participate in the study. A total of 124 students were excluded. Of those 124 students, 27 had

Ass. Prof. Faculty of Health Sciences, Midwifery Department, Adnan Menderes University, Aydın, Turkey

The authors have no conflict of interest to disclose.

Address correspondence to: Keziban Amanak, Faculty of Health Sciences, Midwifery Department, Adnan Menderes University, Kepez Area, Central Campus, 09100, Aydın, Turkey. Email: keziban.amanak@adu.edu.tr

secondary dysmenorrhea, 1 was not in the desired age range (18 to 30 years), 22 had a chronic disease, 17 had vaginal burning/itching/discharge or pelvic inflammatory disease, 3 had a diagnosis of a tumor or fibroma, 41 did not have a body mass index of from 19 to 26, 8 were taking drugs (including oral contraceptives) for their dysmenorrhea, and 5 declined to participate in the study. The 106 students included in the study were assigned numbers for randomization. The first student who fulfilled the eligibility criteria was assigned the number 1, and the other students were numbered consecutively. Each student was assigned to the placebo group (n = 35), the cinnamon group (n = 35), or the dried-fig group (n = 35) using simple randomization (based on the table at the website www.randomizer.org). Four women in the placebo group (3 who did not regularly receive empty capsules and 1 who had to take painkillers), 2 women in the cinnamon group (1 who did not regularly take cinnamon and 1 who had to take painkillers), and 2 women in the dried-fig group (1 who did not regularly eat dried figs and who was not available at the time of data collection) were excluded from the study because they did not comply with the instructions (Figure 1).

Instruments

The Total Dysmenorrhea Score (TDS)

This was used to detect the presence of dysmenorrhea (18,19).

A Descriptive Information Form (DIF)

The form, which was developed by the researcher in light of the relevant literature, is composed of 8 questions that explore the socio-demographic features of the participants (17,20,21,22).

The Visual Analogue Scale (VAS)

This was used to measure pain severity in the participants with dysmenorrhea (23,24,25).

A Pain Duration Assessment Form (PDAF)

This form, which was created by the researcher in light of the relevant literature, was used to determine the minimum duration of each participant’s pain during menstruation (17,20).

The Menstrual Distress Questionnaire (MDQ)

The questionnaire was used to determine the dysmenorrhea symptoms of the students. It was developed

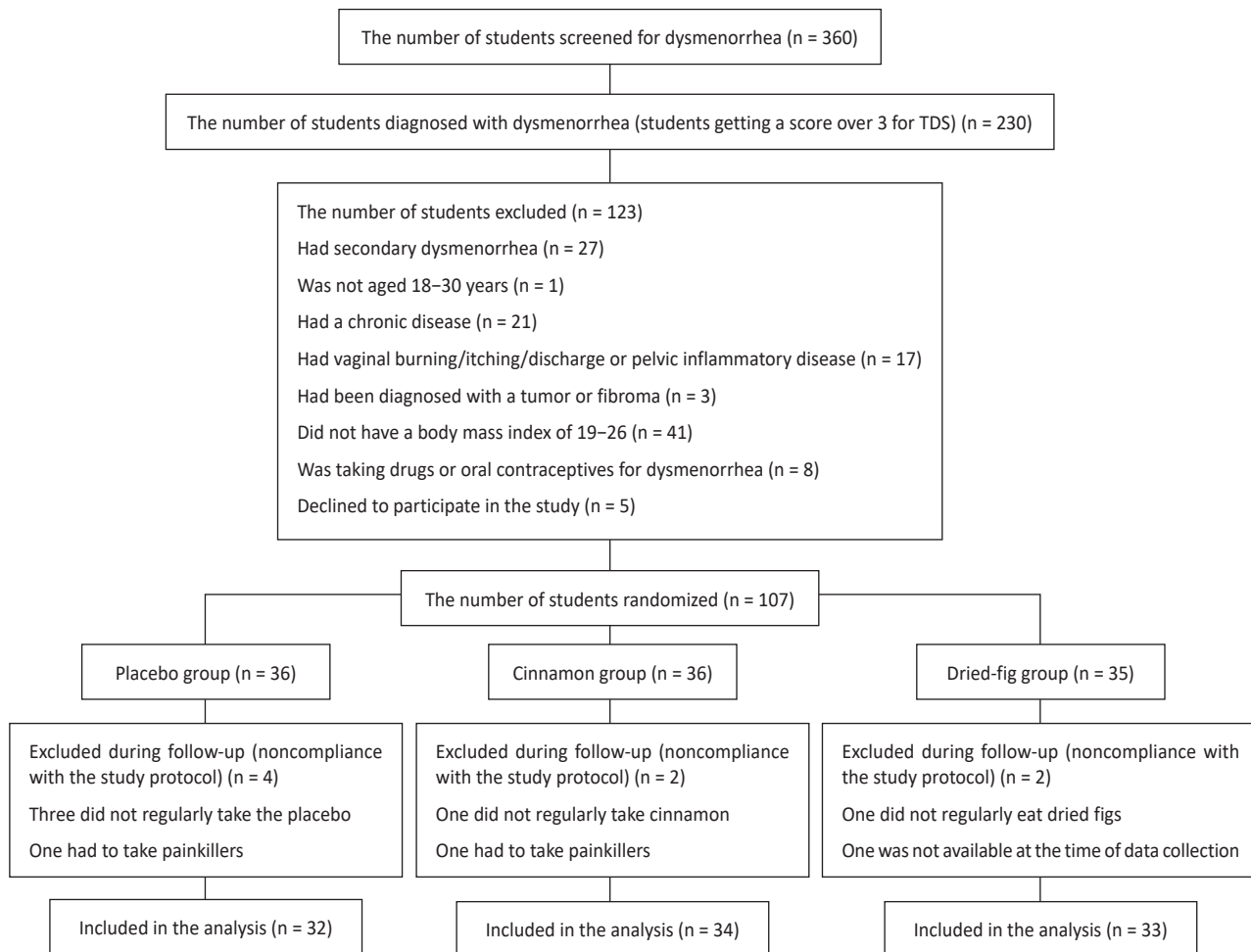


Figure 1. The randomization flow chart

by Moos (1968) (26) and translated into Turkish by Kızılkaya (1992) (27).

The World Health Organization Quality of Life (WHOQOL-BREF-TR)

The scale was used to determine the quality of life of the students. It was developed by the WHO (28), and its validity and reliability for the Turkish population were tested by Fidaner et al. (1999) (29). High scores indicate high quality of life (30).

The Perceived Stress Scale (PSS)

This scale was used to determine the stress levels of the students. It was developed by Cohen, Kamarck, and Mermelstein (31) in 1983. High scores on the scale correlate with high levels of stress. The validity and reliability of the scale for the Turkish population were tested by Eskin et al. (2009) (32).

Intervention

Stage 1

The members of the placebo, cinnamon, and dried-fig groups filled in the TDS, a DIF, the VAS, a PDAF, the MDQ, the WHOQOL-BREF-TR, and the PSS on the first day of their first menstrual cycle after the study was initiated (the cycle without an intervention).

Stage 2

At this stage, the students in the placebo group took a placebo 3 times a day (empty capsules), the students in the cinnamon group took 420 mg of cinnamon powder 3 times a day (1260 mg, daily), and the students in the dried-fig group ate 2 figs (dried in the same year that this study was conducted) 3 times a day (6 dried figs, daily) on the first, second, and third days of their 3 menstrual periods. The cinnamon group took each cinnamon dose after mixing it in a glass of warm water (200 ml). The dried-fig group ate each dose of figs with a glass of warm water (200 ml). The placebo group took each placebo dose with a glass of warm water (200 ml). The cinnamon powder and dried figs used in the study were obtained from companies having certificates from the Turkish Standards Institute ISO 22000 Food Safety Management System, Turkish Standards Institute ISO 9001 Quality Management System and BRC Global Standard for Food Safety, Issue 7. A hundred grams of dried figs contains 217 kcal, 138 mg of calcium, 163 mg of phosphorus, 4.2 mg of iron, 91.5 mg of magnesium, 0.073 mg of vitamin B1, and 0.072 mg of vitamin B2. A hundred grams of cinnamon powder contains 261 kcal, 4g of protein, 53 g of fiber, 1g of saturated fat, and 2g of sugar. In addition, cinnamon has manganese, calcium, magnesium, zinc, potassium, iron, and vitamins B6, E, A, C, and K.

The total daily cinnamon dose was calculated based on the literature ($420 \text{ mg} \times 3 = 1206 \text{ mg}$) (15). In addition, since there have not been any studies on the effects of eating dried figs on primary dysmenorrhea and since the weight of dried figs corresponding to 1206 mg of cinnamon was very low, the

daily dose of dried figs providing the same calories as 1206 mg cinnamon was determined. To achieve this, the number of calories of the total daily cinnamon dose (1206 mg) was calculated: 100 g of cinnamon has 261 kcal; 1260 mg of cinnamon has 329 calories. In terms of the figs, 100 g of dried figs has 217 kcal, meaning that 152 g of dried figs has 329 calories. Therefore, the members of the dried-fig group ate 6 large figs, daily, weighing a total of 150 g (each was 25 g). The participants were told to avoid taking painkillers, and those taking painkillers were excluded from the study.

All the students included in the study were informed about the aim of the study and about the treatment given to the group to which they were assigned. All of them had been made aware that the treatments offered to them were intended to reduce the symptoms of dysmenorrhea. However, the students in each group were not given information about the treatments given to the other groups. The placebo group was informed that the capsules they were receiving contained a drug utilized for the treatment of dysmenorrhea.

The VAS and a PDAF were used to collect data in the first, second, third, fourth, eighth, 16th, 24th, 48th, and 72nd hours of menstruation, and the other data collection tools (the MDQ, WHOQOL-BREF-TR and PSS) were utilized in the 8th hour after the initiation of a given participant's menstruation, as determined by the self-reports of that participant. The stages of the study are presented in Figure 2.

Data analysis

SPSS 20 was used to analyze the obtained data. The comparisons of the 3 groups in terms of sociodemographic characteristics were carried out with the chi-square test. Comparisons between the 3 groups in terms of their mean scores for the VAS, a PDAF, the MDQ, the WHOQOL-BREF-TR, and the PSS for the menstrual cycle without the intervention and for the 3 menstrual cycles with the intervention were carried out with a 1-way ANOVA or Kruskal-Wallis test. The Scheffe test was used as a post-hoc test.

Ethical considerations

The study protocol was approved by the ethical committee for clinical research of the Health Sciences Faculty at Adnan Menderes University (protocol number: 2018/13). In addition permission was obtained from the dean of the Health Sciences Faculty of Adnan Menderes University. Both oral and written informed consents were obtained from the participants.

Results

The descriptive characteristics of the students included in the study are presented in Table 1. The students in the placebo, cinnamon, and dried-fig groups were similar in terms of age, income, the place they lived at the time of the study and the place they had lived for the longest period, type of family, the number of siblings, and their willingness to study midwifery.

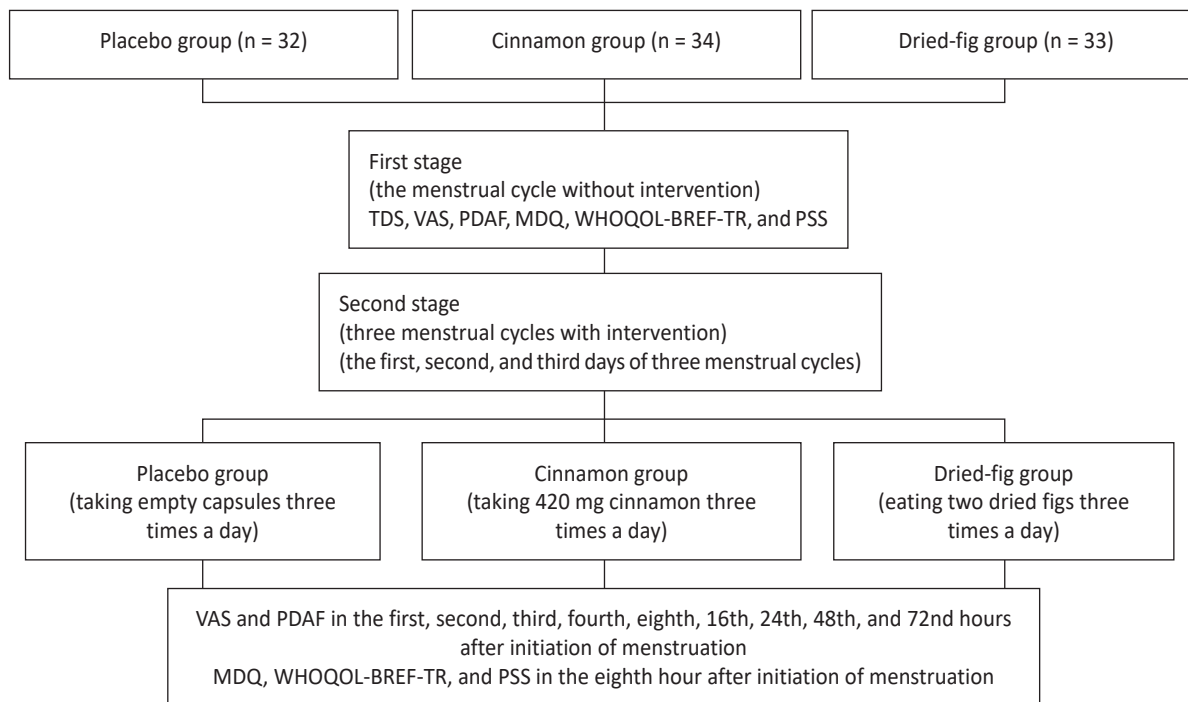


Figure 2. Stages of the study

When the intervention was not performed, there were no significant differences in mean pain scores in the menstrual cycle between the placebo, cinnamon, and dried-fig groups ($p > 0.05$). However, in the 3 menstrual cycles in which the intervention was performed, a 1-way ANOVA showed significantly lower pain scores in the cinnamon and dried-fig groups than in the placebo group ($p < 0.05$). According to the results of the Scheffe test, done to reveal which groups significantly differed, the cinnamon group had significantly lower pain scores than the placebo group did, and the dried-fig group had significantly lower pain scores than the placebo and the cinnamon groups did, in both cases during the 3 menstrual cycles in which the intervention was implemented (Table 2).

When the intervention was not performed, there were no significant differences between the placebo, cinnamon and dried-fig groups in mean minimum pain duration in the menstrual cycle ($p > 0.05$). Based on the results of a 1-way ANOVA, the cinnamon and dried-fig groups had significantly shorter durations of pain than the placebo group did during the 3 menstrual cycles in which the intervention was implemented ($p < 0.05$). According to results of the Scheffe test, during the 3 menstrual cycles in which the intervention was implemented, the members of the cinnamon group had significantly shorter

Table 1. Descriptive characteristics of the students (n = 99).

Descriptive characteristic	Placebo group N (%)	Cinnamon group N (%)	Dried-fig group N (%)	P
Age*	21.56 ± 2.85	21.89 ± 2.14	21.06 ± 2.01	0.710
The place the participant had lived the longest (type of settlement)				
Village	17 (53.1)	18 (53.0)	18 (54.5)	0.845
Small town	8 (25.0)	8 (23.5)	8 (24.2)	
City	7 (21.9)	8 (23.5)	7 (21.2)	
Current residence				
Dormitory	16 (50.0)	17 (50.0)	16 (48.5)	0.875
Family home	9 (28.1)	10 (29.4)	10 (30.3)	
In an apartment, alone	7 (21.9)	7 (20.6)	7 (21.2)	
Mother's highest level of education				
Primary school	13 (40.6)	14 (41.1)	13 (39.4)	0.758
High school	11 (34.4)	12 (35.4)	12 (36.4)	
University or higher	8 (25.0)	8 (23.5)	8 (24.2)	
Mother's employment status				
Employed	11 (34.4)	12 (35.4)	12 (36.4)	0.589
Unemployed	21 (65.6)	22 (64.6)	21 (63.6)	
Father's highest level of education				
Primary school	9 (28.1)	10 (29.4)	10 (30.3)	0.448
High school or two-year university program	13 (40.6)	13 (38.2)	13 (39.4)	
University or higher	10 (31.3)	11 (32.4)	10 (30.3)	
Father's employment status				
Employed by the government	9 (28.1)	10 (29.4)	10 (30.3)	0.654
Blue-collar	9 (28.1)	9 (26.5)	9 (27.3)	
Self-employed	14 (43.8)	15 (44.1)	14 (42.4)	
Income				
High	5 (13.3)	5 (14.7)	4 (12.1)	0.915
Middle	21 (66.7)	23 (67.6)	23 (69.7)	
Low	6 (20.0)	4 (17.7)	6 (18.2)	

*Mean ± SD

durations of pain than those in the placebo group did, and the members of the dried-fig group had significantly shorter durations of pain than those in the placebo and cinnamon groups did (Table 2).

When the intervention was not implemented, there were no significant differences in the mean menstrual distress scores in the menstrual cycle between the groups ($p > 0.05$). A 1-way ANOVA showed that the cinnamon and dried-fig groups had significantly lower mean menstrual distress scores than did the placebo group during the first, second, and third menstrual cycles (in which the intervention was implemented) ($p < 0.05$). According to the results of the Scheffe test, during the 3 menstrual cycles in which the intervention was implemented, the cinnamon group had significantly lower menstrual distress scores than the placebo group did, and the dried-fig group had a significantly lower menstrual distress score than the placebo and cinnamon groups did (Table 3).

During the menstrual cycle in which the intervention was not implemented, the mean stress scores did not differ significantly between the groups ($p > 0.05$). Based on the results of a 1-way ANOVA, the cinnamon and dried-fig groups had significantly lower mean stress scores during the first, second, and third menstrual cycles in which the intervention was implemented than the placebo group did ($p < 0.05$). According to results of the Scheffe test, during the 3 menstrual cycles in which the intervention was implemented, the cinnamon group had significantly lower stress scores than the placebo group did, and the dried-fig group had significantly lower stress scores than the placebo and cinnamon group did (Table 3).

The mean scores for quality of life and its subscales were not significantly different between the groups in the menstrual cycle in which the intervention was not implemented ($p > 0.05$). A 1-way ANOVA showed that the cinnamon and dried-fig groups had significantly higher mean scores for quality of life and its subscales than the placebo group did during the first, second, and third menstrual cycles in which the intervention was implemented ($p < 0.05$). According to results of the Scheffe test, during the 3 menstrual cycles in which the intervention was implemented, the cinnamon group had significantly higher scores for quality of life than the placebo group did, and the dried-fig group had significantly higher mean scores for quality of life than the placebo and the cinnamon groups did (Table 4).

Discussion

In this randomized, placebo-controlled study directed towards examining the effects of eating dried figs on the

Table 2. The mean severity and minimum duration of pain scores of the students during menstrual cycles (n = 99).

	Placebo group mean \pm SD (a)	Cinnamon group mean \pm SD (b)	Dried-Fig group mean \pm SD (c)	P	Post hoc
VAS*					
The cycle without intervention	1.2 \pm 3.1	1.1 \pm 7.4	1.1 \pm 3.3	0.412	
The first cycle with intervention	6.3 \pm 0.4	5.2 \pm 0.6	3.8 \pm 0.7	0.000	(a) vs. (b): 0.002 (a) vs. (c): 0.003 (b) vs. (c): 0.002
The second cycle with intervention	6.1 \pm 0.7	5.7 \pm 1.3	3.4 \pm 2.1	0.000	(a) vs. (b): 0.002 (a) vs. (c): 0.004 (b) vs. (c): 0.002
The third cycle with intervention	6.3 \pm 0.5	5.4 \pm 2.7	3.2 \pm 2.6	0.000	(a) vs. (b): 0.001 (a) vs. (c): 0.001 (b) vs. (c): 0.003
PDAF (minute)*					
The cycle without intervention	2.4 \pm 31.6	2.1 \pm 32.4	2.4 \pm 29.7	0.321	
The first cycle with intervention	14.7 \pm 1.6	9.1 \pm 0.7	6.2 \pm 0.5	0.000	(a) vs. (b): 0.001 (a) vs. (c): 0.001 (b) vs. (c): 0.001
The second cycle with intervention	14.3 \pm 2.1	8.9 \pm 0.3	6.9 \pm 0.4	0.000	(a) vs. (b): 0.003 (a) vs. (c): 0.002 (b) vs. (c): 0.002
The third cycle with intervention	13.7 \pm 2.6	9.3 \pm 0.3	6.5 \pm 0.8	0.000	(a) vs. (b): 0.001 (a) vs. (c): 0.003 (b) vs. (c): 0.001

*The mean VAS and PDAF scores in the first, second, third, fourth, eighth, 16th, 24th, 48th, and 72nd hours

symptoms of primary dysmenorrhea, perceived stress levels, and quality of life, both dried figs and cinnamon decreased the symptoms of primary dysmenorrhea (especially severity and duration of pain), reduced perceived stress levels, and increased quality of life. However, eating dried figs was more effective in reducing the symptoms of primary dysmenorrhea and perceived stress and improving quality of life. These findings show that eating dried figs can create effective relief for the symptoms of primary dysmenorrhea.

The students in the placebo, cinnamon, and dried-fig groups did not significantly differ in their descriptive characteristics. This indicated that these 3 groups were homogeneous and could be compared in terms of their symptoms of primary dysmenorrhea.

During the menstrual cycle without the intervention, the placebo, cinnamon, and dried-fig groups were not significantly different in terms of severity and duration of pain, the symptoms of primary dysmenorrhea, perceived stress levels, and quality of life. This allowed the comparing of the groups in terms of these variables when the intervention was implemented.

During the menstrual cycles in which the intervention was implemented, severity and duration of pain were lower in the dried-fig group than in the cinnamon and placebo groups. Several studies have evaluated the effectiveness of many alternative and complementary methods in the reduction of pain severity in primary dysmenorrhea. Heat therapy (33,34,35) acupressure (36,37,38), and exercise (39,40,41) have been reported to be effective in pain relief. While there have been several studies on the effects of cinnamon on pain (15,42,43), the effects of eating dried figs have not been investigated. The present study is the first to report the effects of eating dried figs on pain management in primary dysmenorrhea.

In this study, during the menstrual cycles in which the intervention was performed, the dried-fig group was found to have experienced fewer symptoms than the cinnamon and placebo groups did. Women with dysmenorrhea have not only pain in the abdomen, back, and groin but also sweating, headaches, dizziness, decreased attention spans, tiredness, fainting, fever, nausea, vomiting, lack of appetite, and diarrhea. These symptoms have a negative impact on women's health and social lives. In addition, the symptomatic treatment of

dysmenorrhea imposes financial burdens on the women who suffer from it and on the countries in which they reside (5,6). Eating dried figs, found to have a positive influence on the symptoms of primary dysmenorrhea, seems to be advantageous since they are easy to use (i.e. they are easy to carry and do not require any tools to consume), inexpensive, and readily available.

During the menstrual cycles in which the intervention was implemented, the students in the dried-fig group had lower scores for perceived stress than did those in the cinnamon and placebo groups. However, there have not been any studies examining the effectiveness of eating dried figs in terms of reducing stress in primary dysmenorrhea. This underlines the need to perform further studies to examine the effectiveness of eating dried figs in terms of alleviating the stress experienced by women with primary dysmenorrhea.

During the menstrual cycles in which the intervention was implemented, the students in the dried-fig group had higher scores for quality of life than those in the cinnamon and placebo groups did. This suggests that eating dried figs can induce a considerable decrease in the negative effects of primary dysmenorrhea for women and enhance the quality of their lives.

This study has several limitations. First, the data collected was based on self-reports of the participants. These data might be different from that garnered in situations observed by specialists. In addition, since the study was conducted at a single center, the results reflect only the study population. Therefore, they cannot be generalized to the whole population. Finally, although the students were informed only about the treatments given to the groups they were assigned to, they might have shared information with each other about the study since they all studied at the same school; such (potential) information sharing could be considered a limitation of the study.

Conclusion

Eating dried figs decreased the symptoms of primary dysmenorrhea, reduced perceived stress, and improved quality of life. In addition, figs are readily available, inexpensive, are carried easily, and do not require any tools to eat. In light of the results of this study and the practicality of eating dried figs, women with primary dysmenorrhea should be advised to eat dried figs. However, this study should be replicated in different samples to confirm the evidence obtained.

Table 3. The mean menstrual distress and stress scores of the students during menstrual cycles (n = 99).

	Placebo group mean ± SD (a)	Cinnamon group mean ± SD (b)	Dried-fig group mean ± SD (c)	P	Post hoc
<i>MDQ*</i>					
The cycle without intervention	42.51 ± 26.0	43.63 ± 29.0	42.72 ± 21.3	0.254	
The first cycle with intervention	39.41 ± 21.2	32.36 ± 11.3	29.01 ± 18.5	0.000	(a) vs. (b): 0.004 (a) vs. (c): 0.005 (b) vs. (c): 0.011
The second cycle with intervention	38.74 ± 20.1	34.25 ± 14.2	29.56 ± 18.7	0.000	(a) vs. (b): 0.001 (a) vs. (c): 0.014 (b) vs. (c): 0.021
The third cycle with intervention	38.21 ± 19.4	33.48 ± 15.5	28.85 ± 19.5	0.000	(a) vs (b): 0.003 (a) vs (c): 0.004 (b) vs (c): 0.003
<i>PSS*</i>					
The cycle without intervention	4.11 ± 0.4	4.08 ± 0.6	4.15 ± 0.2	0.578	
The first cycle with intervention	3.01 ± 0.8	2.99 ± 0.7	2.03 ± 0.3	0.000	(a) vs. (b): 0.004 (a) vs. (c): 0.005 (b) vs. (c): 0.011
The second cycle with intervention	3.04 ± 0.4	2.65 ± 0.8	2.11 ± 0.8	0.000	(a) vs. (b): 0.001 (a) vs. (c): 0.014 (b) vs. (c): 0.021
The third cycle with intervention	3.12 ± 0.6	2.59 ± 0.4	2.07 ± 0.2	0.000	(a) vs. (b): 0.003 (a) vs. (c): 0.004 (b) vs. (c): 0.003

*The mean MDQ and PSS scores in the eighth hour after initiation of the menstrual cycle.

Resumen

Objetivo: El objetivo de este estudio era examinar los efectos de comer higos secos sobre los síntomas de la dismenorrea primaria, los niveles de estrés percibidos y la calidad de vida durante todos los ciclos menstruales. **Métodos:** Este estudio aleatorio y controlado con placebo se realizó en 115 estudiantes de obstetricia. Cada estudiante fue asignado al azar a los grupos de placebo (n = 31), canela (n = 33) o higos secos (n = 34). Los datos se recopilaron mediante la Puntuación Dismenorrea Total, un formulario de información descriptiva, la Escala Visual Analógica, un formulario de evaluación de la duración del dolor, el Cuestionario de Angustia Menstrual, la Escala de Estrés Percibido y la versión abreviada de la Escala de Calidad de Vida de la Organización Mundial de la Salud-TR. **Resultados:** Durante los 3 ciclos menstruales que se ha aplicado la intervención. El grupo del higo seco alcanzó a tener una calificación significativamente más reducida en cuanto a la intensidad y duración del dolor, la angustia y el estrés menstrual, en comparación al grupo de canela e al grupo de placebo. Además, durante esos 3 ciclos, el grupo del higo seco se ha observado que estadísticamente el promedio de calidad de vida siendo alta significativamente en comparación a los grupos de canela y placebo. **Conclusión:** Los resultados mostraron que comer higos secos durante la menstruación disminuyó la intensidad y duración del dolor, los síntomas menstruales y el estrés percibido y aumentó la calidad de vida.

References

- Amiri Farahani ĖL, Hasanpoor-Azghdy SB, Kasraei H, Heidari T. Comparison of the effect of honey and mefenamic acid on the severity of pain in women with primary dysmenorrhea. Arch Gynecol Obstet 2017;296(2):277-283. doi:10.1007/s00404-017-4409-6
- Akduman AT, Budur OÇ. Treatment Modalities in Primary Dysmenorrhea. Article in Turkish. Anadolu Kliniği 2016;21(3):235-240. Accessed September 7, 2019. <https://dergipark.org.tr/pub/anadoluklin/issue/23865/254228>
- Ayan M, Taş U, Söğüt E, et al. Primer dismenore ağrılı hastalarda diklofenak sodyum ve parasetamol tedavi etkinliklerinin Vizüel Analog Skala kullanılarak karşılaştırılması [Comparing efficiencies of diclofenac sodium and paracetamol in patients with primary dysmenorrhea pain by using Visual Analog Scale]. Agri 2013;25(2):78-82. doi:10.5505/agri.2013.42103
- Momoeda M, Kondo M, Elliesen J, Yasuda M, Yamamoto S, Harada T. Efficacy and safety of a flexible extended regimen of ethinylestradiol/drospirenone for the treatment of dysmenorrhea: a multicenter, randomized,

Table 4. The students' mean scores for quality of life during menstrual cycles (n = 99).

WHOQOL-BREF-TR	Placebo group mean ± SD (a)	Cinnamon group mean ± SD (b)	Dried-fig group mean ± SD (c)	P	Post hoc
<i>The cycle without intervention</i>					
Physical	12.45 ± 1.1	12.21 ± 2.2	12.97 ± 1.9	0.785	
Mental	13.74 ± 1.7	13.63 ± 1.4	13.34 ± 1.1	0.547	
Social	13.21 ± 1.5	13.41 ± 2.7	13.76 ± 2.9	0.654	
Environment-TR	13.15 ± 1.5	13.25 ± 1.8	13.89 ± 1.1	0.612	
Overall	13.12 ± 1.7	13.13 ± 1.4	13.25 ± 1.9	0.421	
<i>The first cycle with intervention</i>					
Physical	14.32 ± 1.2	15.21 ± 1.5	15.87 ± 1.7	0.021	
Mental	14.85 ± 1.5	17.22 ± 1.9	17.54 ± 1.7	0.000	(a) vs. (b): 0.001**
Social	15.12 ± 3.0	17.63 ± 2.0	18.21 ± 1.8	0.000	(a) vs. (c): 0.001**
Environment-TR	14.11 ± 1.5	16.21 ± 1.8	16.45 ± 1.9	0.000	(b) vs. (c): 0.003**
Overall	14.52 ± 2.5	16.61 ± 2.7	17.14 ± 1.5	0.000	
<i>The second cycle with intervention</i>					
Physical	13.52 ± 0.5	14.87 ± 1.2	14.21 ± 1.4	0.047	
Mental	15.21 ± 2.9	18.54 ± 3.4	18.42 ± 2.9	0.000	(a) vs. (b): 0.001**
Social	14.41 ± 1.52	16.54 ± 1.8	17.85 ± 1.8	0.000	(a) vs. (c): 0.001**
Environment-TR	14.25 ± 1.9	16.74 ± 1.8	16.33 ± 2.0	0.000	(b) vs. (c): 0.003**
Overall	14.61 ± 2.9	16.70 ± 2.4	17.23 ± 1.8	0.000	
<i>The third cycle with intervention</i>					
Physical	14.25 ± 1.6	15.54 ± 1.8	15.78 ± 1.9	0.044	
Mental	13.75 ± 0.9	16.11 ± 2.9	16.24 ± 2.9	0.000	(a) vs. (b): 0.001**
Social	15.75 ± 2.4	17.53 ± 3.7	18.63 ± 3.7	0.000	(a) vs. (c): 0.001**
Environment-TR	13.05 ± 0.5	15.01 ± 1.8	15.85 ± 1.5	0.000	(b) vs. (c): 0.003**
Overall	14.44 ± 1.9	16.52 ± 2.1	17.06 ± 1.7	0.000	

*The mean WHOQOL-BREF-TR scores in the eighth hour after initiation of the menstrual cycle. **Analysis of the overall mean WHOQOL-BREF-TR scores with the post hoc Scheffe test

- open-label, active-controlled study. Int J Womens Health 2017;9:295-305. Published 2017 May 2. doi:10.2147/IJWH.S134576
- Weissman AM, Hartz AJ, Hansen MD, Johnson SR. The natural history of primary dysmenorrhoea: a longitudinal study. BJOG 2004;111(4):345-352. doi:10.1111/j.1471-0528.2004.00090.x
- Slap GB. Menstrual disorders in adolescence. Best Pract Res Clin Obstet Gynaecol 2003;17(1):75-92. doi:10.1053/ybeog.2002.0342
- Burnett MA, Antao V, Black A, et al. Prevalence of primary dysmenorrhea in Canada. J Obstet Gynaecol Can 2005;27(8):765-770. doi:10.1016/s1701-2163(16)30728-9
- Bahadori S, Salamzadeh J, Kamalinejad M, Ardekani M.R.S, Keshavarz M, Ahmadzadeh A. Bahadori S, Salamzadeh J, Kamalinejad M, Shams Ardekani MR, Keshavarz M, Ahmadzadeh A. Study of the Effect of an Oral Formulation of Fig and Olive on Rheumatoid Arthritis (RA) Remission Indicators: A Randomized Clinical Trial. Iran J Pharm Res 2016;15(3):537-545. Accessed September 11, 2019. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5149042/>
- Deepa DN, Gupta AK, Das HB, Chakraborti A. Medicinal Plants of Tripura. Concept Publishing Company; 2009.
- Al-Snafi AE. Nutritional and pharmacological importance of ficus carica – A review. IOSR J Pharm 2017;7(3):33-48. Accessed September 11, 2019. <http://iosrphr.org/papers/v7i3V1/D0703013348.pdf>
- Park S, Han J, Im K, Whang WK, Min H. Antioxidative and anti-inflammatory activities of an ethanol extract from fig (Ficus carica) branches. Food Sci Biotechnol 2013;22(4):1071-1075. doi.org/10.1007/s10068-013-0185-7
- Kore KJ, Shete RV, Kale BN, Borade AS. Protective role of hydroalcoholic extract of Ficus carica in gentamicin induced nephrotoxicity in rats. Int J Pharm Life Sci 2011;2(8):978-982. Accessed September 15, 2019. <https://pdfs.semanticscholar.org/ce4b/731b607f4c626b73decdbdca21192f3026de.pdf>

13. Alam I, Jat RK, Srivastava V. A Review on traditional, pharmacological, pharmacognostic properties of ficus carica (anjir). *Int Res J Pharm* 2011;2(12):124-27. Accessed September 15, 2019. https://irjponline.com/admin/php/uploads/736_pdf.pdf
14. Öztalay GZ. Aydın yöresi halk hekimliğinde incirin kullanımı. *Karamanoğlu Mehmetbey Üniversitesi Sosyal ve Ekonomik Araştırmalar Dergisi* 2014;2014(4):151-154. <https://doi.org/10.18493/kmusekad.05098>
15. Jaafarpour M, Hatefi M, Khani A, Khajavikhan J. Comparative effect of cinnamon and Ibuprofen for treatment of primary dysmenorrhea: a randomized double-blind clinical trial. *J Clin Diagn Res* 2015;9(4):QC04-QC7. doi:10.7860/JCDR/2015/12084.5783
16. Patel V, Tanksale V, Sahasrabhojane M, Gupte S, Nevrekar P. The burden and determinants of dysmenorrhoea: a population-based survey of 2262 women in Goa, India. *BJOG* 2006;113(4):453-463. doi:10.1111/j.1471-0528.2006.00874.x
17. Şahin S, Kaplan S, Abay H, Akalın A, Demirhan İ, Pinar G. Evaluation of the frequency of dysmenorrhea and associated factors among the university students. Article in Turkish. *Ankara Sağlık Bilimleri Dergisi* 2015;4(1):25-45. https://doi.org/10.1501/Asbd_0000000049
18. Harada T, Momoeda M, Terakawa N, Taketani Y, Hoshiai H. Evaluation of a low-dose oral contraceptive pill for primary dysmenorrhea: a placebo-controlled, double-blind, randomized trial. *Fertil Steril* 2011;95(6):1928-1931. doi:10.1016/j.fertnstert.2011.02.045
19. Harada T, Momoeda M. Evaluation of an ultra-low-dose oral contraceptive for dysmenorrhea: a placebo-controlled, double-blind, randomized trial. *Fertil Steril* 2016;106(7):1807-1814. doi:10.1016/j.fertnstert.2016.08.051
20. Kollipaka R, Arounassalame B, Lakshminarayanan S. Does psychosocial stress influence menstrual abnormalities in medical students?. *J Obstet Gynaecol* 2013;33:489-493. doi:10.3109/01443615.2013.782272
21. Gagaa T, Tkeshelashvili B, Gagaa D, McHedlishvili N. Assessment of anxiety and depression in adolescents with primary dysmenorrhea: a case-control study. *J Pediatr Adolesc Gynecol* 2013;26(6):350-354. doi:10.1016/j.jpag.2013.06.018
22. Akyüz H, Yaşartürk F, Aydın İ, Zorba E, Türkmen M. The Investigation of the Relationship between University Students' Levels of Life Quality and Happiness [in Turkish]. *Int J Cult Soc Stud* 2017;3(Special Issue):253-262. Accessed September 11, 2019. <https://dergipark.org.tr/tr/pub/intjcss/issue/33182/369781>
23. Mirbagher-Ajorpaz N, Adib-Hajbaghery M, Mosaebi F. The effects of acupressure on primary dysmenorrhea: a randomized controlled trial. *Complement Ther Clin Pract* 2011;17(1):33-36. doi:10.1016/j.ctcp.2010.06.005
24. Aslan EF. The Assessment Methods of Pain [in Turkish]. *Cumhuriyet Üniversitesi Hemşirelik Yüksekokulu Dergisi* 2002;6(1):9-16. Accessed September 11, 2019. <http://eskidergi.cumhuriyet.edu.tr/makale/598.pdf>
25. Valiani M, Babaei E, Heshmat R, Zare Z. Comparing the effects of reflexology methods and Ibuprofen administration on dysmenorrhea in female students of Isfahan University of Medical Sciences. *Iran J Nurs Midwifery Res* 2010;15(Suppl 1):371-378. Accessed September 11, 2019. <https://www.ncbi.nlm.nih.gov/pubmed/22069413>
26. Moos RH. The development of a menstrual distress questionnaire. *Psychosom Med* 1968;30(6):853-867. doi:10.1097/00006842-196811000-00006
27. Kızılkaya N. Perimenstrual şikayetlerin hafifletilmesinde hemşirelik girişimlerinin etkinliği. Doctoral Dissertation. İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü, İstanbul; 1994.
28. The WHOQOL Group. The World Health Organization Quality of Life (WHOQOL) – BREF. World Health Organization; 2004.
29. Fidaner H, Elbi H, Fidaner C, Eser SY, Eser E, Göker E. Psychometric properties of WHOQOL-100 and WHOQOL-BREF. Article in Turkish. *Psikiyatri Psikoloji Psikofarmakoloji (3P) Dergisi* 1999;7(Suppl 2):23-40. Accessed September 11, 2019. <http://psikiyatridizini.net/viewarticle.aspx?articleid=24099>
30. Iacovides S, Avidon I, Bentley A, Baker FC. Reduced quality of life when experiencing menstrual pain in women with primary dysmenorrhea. *Acta Obstet Gynecol Scand* 2014;93(2):213-217. doi:10.1111/aogs.12287
31. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav* 1983;24(4):385-396.
32. Eskin M, Harlak H, Demirkıran F, Dereboy Ç. The Adaptation of the Perceived Stress Scale into Turkish: A Reliability and Validity Analysis. Article in Turkish. *New Symp J* 2013;51(3):132-40. Accessed September 11, 2019. <http://yenisympozium.com/Pdf/EN-YeniSempozyum-c1d2631c.PDF>
33. Potur DC, Bilgin NC, Komurcu N. Prevalence of dysmenorrhea in university students in Turkey: effect on daily activities and evaluation of different pain management methods. *Pain Manag Nurs* 2014;15(4):768-777. doi:10.1016/j.pmn.2013.07.012
34. Navvabi Rigi S, Kermansaravi F, Navidian A, et al. Comparing the analgesic effect of heat patch containing iron chip and ibuprofen for primary dysmenorrhea: a randomized controlled trial. *BMC Womens Health*. 2012;12:25. Published 2012 Aug 22. doi:10.1186/1472-6874-12-25
35. Chaudhuri A, Singh A, Dhaliwal L. A randomised controlled trial of exercise and hot water bottle in the management of dysmenorrhoea in school girls of Chandigarh, India. *Indian J Physiol Pharmacol*. 2013;57:114-122.
36. Chen HM, Wang HH, Chiu MH, Hu HM. Effects of acupressure on menstrual distress and low back pain in dysmenorrhoeic young adult women: an experimental study. *Pain Manag Nurs*. 2015;16(3):188-197. doi:10.1016/j.pmn.2014.06.002
37. Kashefi F, Ziyadlou S, Khajehi M, Ashraf AR, Fadaee AR, Jafari P. Effect of acupressure at the Sanyinjiao point on primary dysmenorrhea: a randomized controlled trial. *Complement Ther Clin Pract*. 2010;16(4):198-202. doi:10.1016/j.ctcp.2010.04.003
38. Yeh ML, Hung YL, Chen HH, Wang YJ. Auricular acupressure for pain relief in adolescents with dysmenorrhea: a placebo-controlled study. *J Altern Complement Med*. 2013;19(4):313-318. doi:10.1089/acm.2011.0665
39. Abbaspour Z, Rostami M, Najjar S. The effect of exercise on primary dysmenorrhea. *J Res Health Sci*. 2004;4(2):26-31. Accessed September 11, 2019. <http://jrhs.umsha.ac.ir/index.php/JRHS/article/view/482>
40. Motahari-Tabari N, Shirvani MA, Alipour A. Comparison of the Effect of Stretching Exercises and Mefenamic Acid on the Reduction of Pain and Menstruation Characteristics in Primary Dysmenorrhea: A Randomized Clinical Trial. *Oman Med J*. 2017;32(1):47-53. doi:10.5001/omj.2017.09
41. Yang NY, Kim SD. Effects of a Yoga Program on Menstrual Cramps and Menstrual Distress in Undergraduate Students with Primary Dysmenorrhea: A Single-Blind, Randomized Controlled Trial. *J Altern Complement Med*. 2016;22(9):732-738. doi:10.1089/acm.2016.005
42. Jaafarpour M, Hatefi M, Najafi F, Khajavikhan J, Khani A. The effect of cinnamon on menstrual bleeding and systemic symptoms with primary dysmenorrhea. *Iran Red Crescent Med J*. 2015;17(4):e27032. Published 2015 Apr 22. doi:10.5812/ircmj.17(4)2015.27032
43. Jahangirifar M, Taebi M, Dolatian M. The effect of Cinnamon on primary dysmenorrhea: A randomized, double-blind clinical trial. *Complement Ther Clin Pract*. 2018;33:56-60. doi:10.1016/j.ctcp.2018.08.001