



Nonpharmacologic Methods Used in the Management of Premenstrual Syndrome: A Systematic Review of Randomized Controlled Postgraduate Theses

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Abstract

Objective: The aim of this study is to examine the randomized controlled postgraduate nursing theses on nonpharmacological applications used in the management of premenstrual symptoms.

Method: In this systematic review, theses registered to the National Thesis Center were searched between October 2022 and November 2022 using the keywords "PMS", "premenstrual syndrome" and/or "premenstrual syndrome". As a result of the search, 130 studies were found and 4 randomized controlled dissertations meeting the inclusion criteria were included in the study.

Results: The included studies were sorted and analyzed according to years, and numerical analyzes were carried out in computer environment. Results of the interventions used in the study, Premenstrual Syndrome Scale (PMSS), Depression Anxiety Stress Scale (DASS), Visual Pain Scale (VAS), Menstrual Distress Complaint List, Perceived Stress Scale, World Health Organization Quality of Life Assessment Scale Short Form, Menstrual Distress Complaint List was evaluated using the WHO Short Form of the Quality of Life Scale (WHO-SF) and the Healthy Lifestyle Behaviors Scale (SYBDS II).

Conclusion: The theses in the study showed that aromatherapy, health-related education models, the use of health belief models and acupressure were effective in alleviating PMS symptoms.

Keywords: PMS, Premenstrual syndrome, Nonpharmacological methods, Randomized controlled, Postgraduate thesis

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1. Introduction

Premenstrual syndrome (PMS) is characterized by significant somatic and psychological symptoms that occur at the beginning of the luteal phase of the menstrual cycle and end with menstruation, and is frequently experienced by millions of women of reproductive age worldwide (1,2). The American College of Obstetrics and Gynecology (ACOG) defined premenstrual syndrome (PMS) as a clinical condition characterized by the cyclical occurrence of physical and emotional symptoms that are not associated with any structural disorder, starting within five days before menstruation and ending by the fourth day of menstruation (3). The global prevalence of this syndrome is 47.8% worldwide (2). Among them, about 20% of women experience symptoms severe enough to interfere with their daily activities and the rest have mild to moderate symptoms. Symptoms of PMS include changes in appetite, weight gain, complaints of pain in the abdomen, lower back and head, breast swelling and tenderness, nausea, constipation, anxiety, irritability, anger, fatigue, restlessness, mood swings and crying (4). Although the pathophysiology of premenstrual syndrome has not been clearly explained, it is believed to be triggered by hormonal changes after ovulation (5-7). PMS is likely to be affected by the effect of progesterone on neurotransmitters such as gamma-aminobutyric acid (GABA), opioids, serotonin and catecholamine. Increased sensitivity to progesterone and pre-existing serotonin deficiency are also thought to be

responsible for this disorder. Increased prolactin levels or increased sensitivity to prolactin action, changes in glucose metabolism, abnormal hypothalamic-pituitary-adrenal (HPA) axis function, insulin resistance and some nutritional electrolyte deficiencies and genetic factors have a role in PMS. Stress causes dysmenorrhea by increasing sympathetic activity and thus uterine contractions (6,7). Premenstrual syndrome is managed with nonpharmacologic, pharmacologic and surgical therapies. In the first stage, the condition should be managed with nonpharmacologic treatments. Nonpharmacologic treatments consist of pharmacologic and non-surgical applications such as exercise, reflexology, vitamin preparations, aromatherapy and herbal products (8). These methods are more reliable and have fewer complications compared to pharmacologic and surgical treatments (9). International literature suggests that nonpharmacologic treatments are an effective way to improve PMS symptoms method in the treatment of PMS. In a randomized controlled trial conducted by Heidari et al. in which participants received vitamin D or placebo every two weeks for four months, a significant improvement in PMS symptoms was shown (10). In a meta-analysis examining the effect of yoga on PMS, it was concluded that yoga reduced PMS (11). In a meta-analysis examining the effect of electroacupuncture on PMS, acupuncture was found to significantly reduce PMS (12). Another study investigated turmeric and PMS and found that turmeric reduced symptoms (13). Studies examining psychosocial interventions with PMS also reported that they were effective in reducing PMS symptoms (14,15). It is important to enrich studies on the subject, to provide evidence-based practices and to educate nurses about the subject. It is essential to increase the number of randomized controlled studies to ensure evidence-based practices. Therefore, our aim in this study was to examine the postgraduate theses in Turkey that conducted randomized controlled studies of nonpharmacological applications used in the management of premenstrual syndrome in the field of nursing and to guide nursing practices and contribute to the literature by evaluating the results.

2. Methods

This study is a systematic review and was conducted to examine the findings of randomized controlled postgraduate theses on PMS in the field of nursing between 2000 and 2022. In the first phase of the study "Premenstrual syndrome", "PMS", "premenstrual syndrome" keywords and literature search was conducted with the Higher Education Council (YÖK) National Thesis Center Database. This phase was carried out between October 2022 and November 2022. As a result of the search, 130 studies were found. After the studies were examined by the researchers, it was seen that only 47 of the 130 studies were postgraduate theses in the field of nursing. Seven of these 45 studies were experimental type studies. After examining the seven studies, it was seen that 6 studies were randomized control studies. After re-evaluating the six studies, two of them were found to be studies on perimenstrual distress and were excluded from the study. The study was conducted with four randomized controlled trials. The included studies were sorted and examined according to years and their numerical analysis was performed in a computer environment. After the evaluations, the studies were summarized in a table as thesis title, year, thesis type, intervention, sample size, data collection tools and results.

Since this study was a literature review, ethics committee permission was not required.

Inclusion criteria;

-In the YÖK National Thesis Center Database, the following theses were included: Department of Nursing, Department of Women's Health and Diseases Nursing, Department of Obstetrics and Gynecology Nursing

-Published between 2000 and 2022

-The keywords PMS, premenstrual syndrome, premenstrual syndrome are included in the thesis,

-Which is a randomized controlled experimental study,

Graduate theses for which the full text was available were included in the study.

3. Results

As a result of this systematic literature review, it was found that there were four postgraduate theses on PMS between 2000 and 2022 in the Department of Nursing, Department of Women's Health and Diseases Nursing, Department of Obstetrics and Gynecology Nursing. It was observed that 75% of the theses were doctoral dissertations (Table 1).

Table 1. Distribution of Theses According to Types

Thesis Type	n	%
Master's Degree	1	25
PhD	3	75

Although the first thesis on the subject was conducted in 2008, it is seen that the studies intensified after 2016 (Table 2).

Table 2. Distribution of the Theses Analyzed According to Years

Year of publicatio	2016	2017	2018	2022
Number of thesis	1	1	1	1
%	%25	%25	%25	%25

The studies were conducted in different sample groups such as university students, individuals with PMS risk behaviors, and individuals applying to Family Health Center (FHC). The studies were conducted by applying reflexology, yoga, aromatherapy, training based on the Health Belief Model (HIM) + acupressure and healthy lifestyle behaviors training interventions. The results of the interventions used in the study were evaluated through the Premenstrual Syndrome Scale (PMSS), Depression Anxiety Stress Scale (DASS), Visual Pain Scale, Menstrual Distress Complaint List, Perceived Stress Scale, World Health Organization Quality of Life Assessment Scale Short Form (WHOQOL-SF), Menstrual Distress Complaint List (SUS) and Healthy Lifestyle Behaviors Scale (HLSBS II). The author, year of publication, purpose, study group, study type, measurement tool used, sample size and results of the postgraduate theses are summarized in Table 3 (Table 3)

Table 3. Information on Graduate Theses

Author/Year	Title	Objective	The group to which the study was applied	Sample size	Intervention	Measurement tool used	Conclusion
Tuğba UZUN ÇAKMAK, 2016[16]	The effect of aromatherapy on coping with premenstrual syndrome in university students	Studying the effect of aromatherapy on PMS	Students with PMS staying in university dormitories	Experiment:40 Control:37	Aromatherapy	PMSS	Inhalation aromatherapy has been found to be effective in coping with PMS, reducing anxiety, depressive affect, fatigue, irritability, pain, bloating, depressive thoughts
Nazife BAKIR,2017[17]	The effect of healthy lifestyle behaviors training in university students with premenstrual complaints	Investigation of the effect of healthy lifestyle behaviors training given to individuals with PMS risk factors on PMS symptoms and healthy lifestyle behaviors	Health Services Female students studying at the Vocational School	Experiment:77 Control: 78	Healthy lifestyle behaviors training	DASS PMSS HLSBS II	It was found that healthy lifestyle behaviors training improved health behaviors, was effective in reducing risk factors for premenstrual complaints and decreased premenstrual complaints.
Didem ŞİMŞEK KÜÇÜKKELEPÇE, 2018 [18]	The effect of acupressure and training on premenstrual symptoms and quality of life under the guidance of the Health Belief Model for coping with premenstrual syndrome	The effect of health belief model-based education and acupressure on premenstrual symptoms and quality of life	All women with PMS registered at ASMs in a specific region in Adiyaman province center	51 education + acupressure 55 training, 57 control group	Training based on health belief model+acupressure	PMSS WHOQOL-SF	PMS symptoms decreased and quality of life improved after training and acupressure. It was also found that education and education + acupressure had a similar effect on PMS.
Ece ÖZKARADIĞİN,2022 [19]	Evaluation of the effectiveness of web-based education on premenstrual syndrome (PMS) symptoms and quality of life	Examining the effectiveness of web-based education on PMS symptoms and quality of life	University students with PMS	Experiment:33 Control:33	Web-based education	PMSS, SUS	Web-based training was found to be effective in reducing PMS symptoms and improving quality of life.

4. Discussion

Complications and costs of pharmacologic and surgical treatments in the management of premenstrual syndromes have made nonpharmacologic methods more reliable and advantageous. The fact that nonpharmacologic applications are frequently preferred options has led to the need for studies in the nursing profession. In our study, postgraduate theses on the subject in the field of nursing in Turkey were examined. Uzunçakmak (2016) looked at the relationship between aromatherapy and PMS symptoms in her thesis and found that inhalation aromatherapy via lavender oil was effective in the management of PMS and also reduced symptoms of fatigue, bloating, exhaustion, depression, anxiety, irritable mood, pain (16). Heydari et al. in 2016, 31 control subjects in Iran 33 intervention group, it was reported that psychological ($p < 0.001$), physical, social and total PMS scores of the aromatherapy group using essential oils of *Rosa damascena* decreased, while no change was observed in the control group (20). In a single-blind randomized controlled study conducted by Matsumoto et al. in Japan in 2016 with aromatherapy groups and placebo groups, it was reported that tension-anxiety, anger-hostility and fatigue decreased in aromatherapy groups, but no change was observed in other symptoms (21). Lotfipour- Rafsanjani et al. (2018) found that aromatherapy massage significantly reduced PMS physical and mental symptoms compared to massage therapy (22). The findings in Uzunçakmak's thesis are in line with the literature and show that aromatherapy is an effective method for managing PMS symptoms. Şimşek Küçükkeleşçe (2018) found in her thesis that the training and acupressure intervention given to women with PMS using the health belief model reduced PMS complaints. It is also stated that education and acupressure practices have similar effects (18). When randomized controlled studies examining the effect of acupressure on PMS were examined, 97 students diagnosed with PMS were divided into 3 groups as LIV3, LI4 acupuncture and placebo points in a single-blind randomized study and it was shown that application of simple acupressure protocol in LIV3 and LI4 led to a decrease in PMS symptoms, depression and anxiety severity and improvement in quality of life. In addition, pressure in LIV3 and LI4 was found to be equally effective (23).

In a randomized controlled study examining the effectiveness of acupressure and reflexology on PMS, it was found that both methods reduced the severity of PMS, but reflexology was found to be the more effective method (24). Studies show that acupressure is effective on PMS symptoms.

In her thesis, Bakır (2017) provided training based on healthy lifestyle behaviors to university students with PMS complaints and found that after the training, the health behaviors of the students improved and there was a decrease in PMS complaints by reducing the risk factors causing premenstrual complaints (17). Özkaradığın (2022) found that PMS symptoms decreased and quality of life increased in university students with PMS who were given web-based training prepared with reference to the Premenstrual Syndrome Management Guide and evidence-based practices for the management of PMS (19). Şimşek Küçükkeleşçe (2018) also found that training based on the health belief model reduced PMS complaints (18). The findings of the study are in parallel with the findings of other studies on the subject. In a randomized controlled study investigating the effectiveness of a health belief model-based health education program on PMS in late adolescence, health belief model-based education was found to be effective in coping with PMS (25). In Pondicherry, a significant decrease was found in total PMS and all subscale scores three months after the health education given to secondary school students with PMS compared to the pre-training period (26). It was found that there was a significant decrease in PMS severity of students after the training program applied to nursing college students (27). Shakiba et al. also found that dysmenorrhea decreased after an educational intervention based on the health belief model applied to hospital staff experiencing PMS (28). In the study of Khalilipour Darestani et al. (2017), it was reported that the implementation of education based on the health belief model was effective in the adoption of PMS preventive behaviors (29). The results of the postgraduate theses included in our study are similar to the results of the literature and show that education reduces PMS complaints and

facilitates coping with PMS and has a positive effect on PMS by ensuring the adoption of preventive behaviors.

5. Conclusion

The theses in our study showed that aromatherapy, health-related education models, use of health belief models and acupressure were effective in alleviating PMS symptoms. These nonpharmacological interventions have become popular in the management of PMS over the last decade and hold significant promise for other areas of human health.

References

1. Abdnezhad R, Simbar M, Sheikhan Z, Mojab F, Nasiri M. The effect of Salvia (Sage) extract on the emotional symptoms of premenstrual syndrome. *Iran J Obstet Gynecol Infertil.* 2017; 20:84-94. Doi:10.22038/IJOGI.2017.10160
2. Nascimento AF, Gaab J, Kirsch I, Kossowsky J, Meyer A, Locher C. Open- label placebo treatment of women with premenstrual syndrome: study protocol of a randomised controlled trial. *BMJ Open.* 2020; 17:10(2):e032868
3. ACOG (American Collage of Obstetricians and Gynecologists), Premenstual Syndrome (PMS), 2021: Erişim tarihi: 25.12.2022, Erişim adresi: <https://www.acog.org/womens-health/faqs/premenstrual-syndrome>
4. Akmalı N, Özerdoğan N, Gürsoy E. Prevalence of premenstrual syndrome, associated factors and its effect on quality of life in women of reproductive age working in a public hospital. *Mersin University Journal of Health Sciences.* 2020; 13(1): 63-74.
5. Rapkin AJ, Akopians AL. Pathophysiology of premenstrual syndrome and premenstrual dysphoric disorder. *Menopause Int.* 2012;18(2):52-9. Doi:10.1258/mi.2012.012014 PMID: 22611222
6. Barth C, Villringer A, Sacher J. Sex hormones affect neurotransmitters and shape the adult female brain during hormonal transition periods. *Front Neurosci.* 2015; 9:37.
7. Vaghela N, Mishra D, Sheth M, Dani VB. To compare the effects of aerobic exercise and yoga on Premenstrual syndrome. *J Educ Health Promot.* 2019; 8:199.
8. Gnanasambanthan S, Datta S. Premenstrual syndrome. *Obstetrics, Gynaecology & Reproductive Medicine.* 2019; 29(10): 281-285.
9. Sehati Shafaie F, Dastgheib Shirazi H, Kamalifard M, Ghojazadeh M. The effect of foot medical zone-therapy reflex on the intensity of PMS symptoms in students (double-blind random controlled clinical trial). *Iranian Journal of Obstetrics, Gynecology and Infertility.* 2018;21(7):10
10. Heidari H, Amani R, Feizi A, Askari G, Kohan S, Tavasoli P. Vitamin D Supplementation for Premenstrual Syndrome-Related inflammation and antioxidant markers in students with vitamin D deficient: a randomized clinical trial. *Sci Rep.* 2019;9(1):14939. Doi:10.1038/s41598-019-51498-x
11. Pal A, Nath B, Paul S, Meena S. Evaluation of the effectiveness of yoga in management of premenstrual syndrome: a systematic review and meta-analysis, *Journal of Psychosomatic Obstetrics & Gynecology*,2022:517-525 Doi:10.1080/0167482X.2022.2086457
12. Zhang J, Cao L, Wang Y, Jin Y, Xiao X, Zhang Q. Acupuncture for Premenstrual Syndrome at Different Intervention Time: A Systemic Review and Meta- Analysis. *Evid Based Complement Alternat Med.* 2019;25; 6246285. Doi:10.1155/2019/6246285
13. Khayat S, Fanaei H, Kheirkhah M, Moghadam ZB, Kasaeian A, Javadimehr M. Curcumin attenuates severity of premenstrual syndrome symptoms: A randomized, double-blind, placebo-controlled trial. *Complement Ther Med.* 2015;23(3):318-24. Doi: 10.1016/j.ctim.2015.04.001.
14. Shariati K, Ghazavi H, Saeidi M, Ghahremani S, Shariati A, Aryan H, ... Ghazanfarpour M. Psychotherapy for depression and anxiety in premenstrual syndrome (PMS): a systematic review and meta-analysis. *International Journal of Pediatrics.*2019; 7(3): 9169-9179.

15. Han J, Cha Y, Kim S. Effect of psychosocial interventions on the severity of premenstrual syndrome: a meta-analysis. *Journal of Psychosomatic Obstetrics & Gynecology*. 2019; 40(3): 176-184
16. Uzunçakmak T. The Effect of Aromatherapy Applied to University Students on Coping with Premenstrual Syndrome. Doctoral Thesis, Gazi University Institute of Health Sciences, Ankara,2016
17. Bakır N. The Effect of Healthy Lifestyle Behaviors Education on University Students with Premenstrual Complaints. Doctoral Thesis, Istanbul University Institute of Health Sciences, Istanbul,2017.
18. Şimşek Küçükkeleş D. The Effect of Training and Acupressure Guided by the Health Belief Model for Coping with Premenstrual Syndrome on Premenstrual Symptoms and Quality of Life. Doctoral Thesis, İnönü University Institute of Health Sciences, Istanbul,2018
19. Özkaradiğın E. Evaluation of the Effectiveness of Web-Based Education on Premenstrual Syndrome (PMS) Symptoms and Quality of Life. Master's Thesis, Pamukkale University, Institute of Health Sciences, Denizli, 2022
20. Heydari N, Abootalebi M, Tayebi N, Hassanzadeh F, Kasraeian M, Emamghoreishi M & Akbarzadeh M. The effect of aromatherapy on mental, physical symptoms, and social functions of females with premenstrual syndrome: A randomized clinical trial. *J Family Med Prim Care*. 2019;8(9):2990-2996. Doi: 10.4103/jfmpc.jfmpc_452_19.
21. Matsumoto T, Kimura T, Hayashi T. Aromatic effects of a Japanese citrus fruit—yuzu (*Citrus junos* Sieb. ex Tanaka)—on psychoemotional states and autonomic nervous system activity during the menstrual cycle: a single- blind randomized controlled crossover study. *BioPsychoSocial medicine*. 2016;10(1): 1-11.
22. Lotfipour-Rafsanjani SM, Ravari A, Ghorashi Z, Haji-Maghsoudi S, Akbarinasab J, Bekhradi R. Effects of Geranium aromatherapy massage on premenstrual syndrome: A clinical trial, *International Journal of Preventive Medicine*.2018;9: 98
23. Bazarganipour F, Taghavi SA, Allan H, Beheshti F, Khalili A, Miri F, Salari S. The effect of applying pressure to the LIV3 and LI4 on the symptoms of premenstrual syndrome: A randomized clinical trial. *Complement Ther Med*. 2017; 31:65-70. Doi: 10.1016/j.ctim.2017.02.003.
24. Padmavathi P. Effect of acupressure vs reflexology on pre-menstrual syndrome among adolescent girls--a pilot study. *Nurs J India*. 2014;105(5):236-9.
25. Ayaz-Alkaya S, Yaman-Sözbir Ş, Terzi H. The effect of Health Belief Model- based health education programme on coping with premenstrual syndrome: a randomised controlled trial. *International Journal of Nursing Practice*.2020; 26(2): e12816.
26. Ramya S, Rupavani K, Bupathy A. Effect of educational program on premenstrual syndrome in adolescent school girls. *Int J Reprod Contracept Obstet Gynecol*. 2016; 3(1): 168-71.
27. Abdalla N, Gibreel M. Effects of an educational program in increasing knowledge and reducing premenstrual syndrome signs, symptoms and severity among nursing college students. *International Journal of Basic and Applied Sciences*. 2016; 5(4): 200.
28. Shakiba S, Shojaeizadeh D, Sadeghi R, Azam K. The effectiveness of educational intervention based on the health belief model on eating style and the severe reduction of menstrual pain among clinical personnel of the imam khomeini hospital complex. *Iran J Health Educ Health Promot*. 2016; 4(2): 158- 68.

29. Khalilipour Darestani M, Panahi R. Effect of Education on Promoting Preventive Behaviors of Premenstrual Syndrome in Female Adolescents: Health Belief Model Application. J Educ Community Health. 2017; 4(2): 44-54. Doi: 10.21859/jech. 4.2.44

Article Information Form

Ethical Approval: Ethics Committee approval was not required in this study since the accessibility of all of the postgraduate theses examined in the study was approved by the authors.

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