

# Effect of Yoga on Premenstrual Syndrome: A Systematic Review

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## ABSTRACT

**Introduction:** Yoga takes an approach that addresses the mental and spiritual aspects, making it a powerful tool for treating medical conditions that often do not respond well to traditional methods. Researchers have a growing interest in studying the effects of yoga on chronic health issues and mental wellbeing.

**Aim:** To investigate and summarise the impact of yoga on premenstrual syndrome.

**Materials and Methods:** For this systematic review, international databases (Google Scholar, PubMed, EBSCOhost, and ScienceDirect) were systematically searched from the inception of the databases until January 31, 2024. The keywords “premenstrual syndrome” and “yoga” were employed, and “Medical Subject Headings” (MeSH) were utilised for these keywords. Two researchers independently screened articles, and consensus for inclusion was achieved through mutual

discussions. All studies assessing the effect of yoga on premenstrual syndrome were extracted from the selected studies without restricting to the form or type of yogic intervention.

**Results:** A total of 35 studies on the subject were scrutinised, and 12 publications meeting the inclusion and exclusion criteria were incorporated in the study for evaluation. All studies indicated that yoga is effective in reducing at least one or some of the physical symptoms, such as bloating, pain, fatigue, breast tenderness, appetite changes, and psychological changes like irritability, stress, anxiety, depression, loss of interest, attention, control, and arousal during premenstrual syndrome. There is a lack of clarity regarding the effect of yoga on many other symptoms of premenstrual syndrome.

**Conclusion:** Yoga interventions demonstrate effectiveness in alleviating premenstrual symptoms in women with premenstrual syndrome.

**Keywords:** Alternative therapies, Complementary therapies, Menstruation disorder, Premenstrual dysphoric disorder, Premenstrual tension

## INTRODUCTION

Premenstrual syndrome is a combination of psychological, physiological, and behavioural symptoms experienced by women of reproductive age during the late luteal phase of their menstrual cycle, which resolve completely after menstruation [1]. The worldwide prevalence of premenstrual syndrome among women is 47.8% [2], with 28.61% reporting interference in daily life activities due to premenstrual syndrome during each cycle [3]. The reported symptoms of premenstrual syndrome number around 300 [4], encompassing common behavioural, physical, and psychological symptoms such as insomnia, fatigue, dizziness, changes in appetite and libido, anger, irritability, anxiety, mood swings, tension, confusion, lack of concentration, forgetfulness, low self-esteem, headache, backache, abdominal pain, breast swelling and tenderness, weight gain, water retention, muscle, and joint pain [5]. Medicinal and non medicinal treatments are widely used to alleviate premenstrual syndrome symptoms. Given the absence of a recognised treatment to date, many women seek therapeutic approaches beyond medicine [6]. Various alternative and complementary techniques utilised by women for relieving premenstrual syndrome symptoms include acupuncture, the use of herbs and oil, nutritional supplements, dietary manipulation, and Mind-Body Therapies (MBTs), which encompass psychotherapy, hypnotherapy, bodywork, relaxation techniques, biofeedback, guided imagery, and yoga [7,8]. Exercise and stress-relieving techniques are considered cost-effective for treating mild premenstrual syndrome symptoms [9]. Yoga, with its comprehensive approach to wellness, incorporates physical poses, movements, breathwork, relaxation, mindfulness, and meditation [10]. Yoga exercise increases Alpha brain waves and decreases serum cortisol, promoting a peaceful and relaxed mental state in

women suffering from premenstrual syndrome [11,12]. It enhances the quality of life and reduces premenstrual symptoms, making it a recommended approach [13]. Despite numerous studies examining complementary and alternative therapies for relieving premenstrual symptoms, few directly investigate the effect of yoga on premenstrual syndrome. To address this gap, this review systematically studies freely accessible, full text literature on the impact of yoga on premenstrual syndrome.

## MATERIALS AND METHODS

**Search strategy:** The Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines [14] were utilised for this systematic review. The electronic databases were thoroughly searched from the inception of the databases to January 31, 2024. These databases included EBSCOhost, PubMed, Google Scholar, and ScienceDirect. The keywords used were “premenstrual syndrome” and “yoga”. Additionally, studies from the Google Scholar search under ‘Related Articles’ were screened and included if they met the inclusion criteria. Further details regarding the search strategies used for each database are as follows:

- EBSCOHost: “premenstrual syndrome” AND “yoga” (Title)
- Google Scholar: “premenstrual syndrome” AND “yoga” (all in title)
- PubMed: “premenstrual syndrome” (Title/Abstract) AND “yoga” (Title)
- ScienceDirect: “premenstrual syndrome” (Title/Abstract) AND “yoga” (Title)

**Inclusion criteria:** All open access, clinical trials, quasi-experimental, cross-sectional, and comparative studies that investigated the

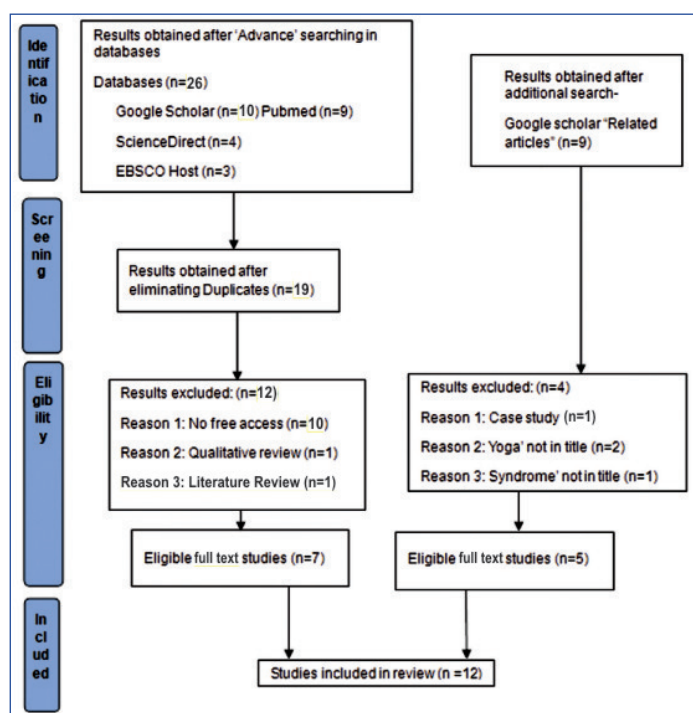
impact of yoga on premenstrual syndrome. The target population comprised women of menstrual age experiencing premenstrual syndromes. All potentially relevant, free access, full text papers were assessed to determine if they met the inclusion criteria.

**Exclusion criteria:** Review articles, non English publications, non full text articles, case histories, and those requiring paid access were excluded from the study. The intervention of interest was yoga, and the outcome of interest was premenstrual syndrome [Table/Fig-1].

<b>P-population</b>	All women with premenstrual syndrome
<b>I-intervention</b>	Yoga regardless of type and duration
<b>C-comparison</b>	All types of comparison (of the yoga experimental group with the control group, and other interventional groups)
<b>O-outcomes</b>	All relevant premenstrual symptoms
<b>S-study type</b>	All study types

[Table/Fig-1]: PICOS criteria for inclusion and exclusion of studies.

As no primary data was collected, ethical approval was not required for this study. The flowchart below represents the study selection process [Table/Fig-2].



[Table/Fig-2]: Study selection flowchart.

**Quality and risk of bias assessment:** The authors assessed the quality and risk of bias for each study included in the review using a modified version of the Downs SH and Black N Checklist [15].

**Selection of eligible studies:** The research included in the systematic review was conducted from the inception of the databases to January 2024. There was no limitation in terms of the years covered while reviewing the literature. The full text of the research, which were published in English and had free/open access, were included in the study. All studies were included without limitation of the type/form of yoga and symptom type. The titles of full articles were reviewed against the inclusion and exclusion criteria; any uncertainty regarding the eligibility of the study was resolved through discussion among the first and second authors.

## RESULTS

**Study selection:** A total of 26 articles were retrieved from the databases: 10 from Google Scholar, nine from PubMed, four from ScienceDirect, and three from EBSCOHost. Out of the 19 non duplicated studies, full articles of 10 studies were unavailable, and one study was found to be a qualitative review, while one was a literature review. The remaining seven were accessed for full articles. Nine unduplicated articles were shortlisted from the 'Related articles' search in Google Scholar, which matched the inclusion/exclusion criteria for selection and were accessed for full articles. One study was a case study and was, therefore, excluded. Two studies were related to yoga but did not have 'yoga' in the title and were, therefore, excluded. One study did not have 'syndrome' in the title and hence was excluded [Table/Fig-2].

**Study characteristics:** A total of 703 women were part of 12 studies included in this research. [Table/Fig-3] represents the findings in terms of authors, research purpose, sample, measurement tools used, type and duration of yoga intervention, and the type of research [11,16-26].

**Types of yoga intervention and procedures:** A well-defined yoga protocol/intervention was applied in seven studies [11,16,19-21,25], and one study used a Digital Video Disc (DVD) for the application of the intervention [26].

The yoga protocol was evaluated for four weeks in two studies [20,23], six weeks in one study [11], 10 weeks in five studies [18,19,21,22,25], and 12 weeks in three studies [16,17,26]. In one study, the duration was not specified [24]. The repetition of the yoga intervention each week varied: every day in one study [25], six times in one study [19], five times in one study [17], three times in five studies [18,20-22,26], and two times in three studies [11,16,23]. In one study [24], it was not clear or specified. The duration of each intervention session varied between 30 minutes in one study [26], 40 minutes in another study [20], 45 minutes in three studies [19,23,25], 50 minutes in two studies [11,16], and 60 minutes in four studies [17,18,19,22].

**Effect of yoga on premenstrual syndrome:** For the purpose of this review, the premenstrual symptoms encountered in 12 studies

Author (year) [reference]	Study design	Sample size	Purpose of the study	Outcome measures	Intervention duration
Wu WL et al., (2015) [11]	Pre-post experimental design	20 women (20-30 years of age) EG: 11, CG:09	To examine the attention task results of women with premenstrual syndrome	Translated, Premenstrual Assessment Form (PAF), Menstrual Distress Questionnaire (MDQ), Electroencephalography (EEG) system	6 weeks, 2 times a week, 50 minutes each session
Tsai SY, (2016) [16]	Yoga intervention study	64 women (20-45 years of age)	To examine the relationship between yoga and premenstrual syndrome	Self-reported premenstrual symptoms questionnaire, Short-Form 36-Item Health Survey	12 weeks, 2 times a week, 50 mins each session
Bharati M (2016) [17]	Comparative, quasi-experimental study	58 women (18-22 years of age) yoga Grp: 20, Oral Calcium Grp: 20, CG, 18	To compare the effects of yoga and calcium administration in alleviation of premenstrual syndrome	Pre-designed validated American College of Obstetricians and Gynecologists (ACOG) based questionnaire	12 weeks, 5 times a week, 60 min each session
Kamalfard M et al., (2017) [18]	Randomised controlled clinical trial	54 women (20-45 years of age), EG:26, CG:28	To evaluate the effect of yoga exercise on premenstrual syndrome	Premenstrual Symptom Screening Tool (PSST)	10 weeks, 3 times a week, 60 min each session
Lata P and Lohan U (2018) [19]	Pre-post experimental design	60 women (17-28 years of age), EG: 30, CG: 30	To evaluate the effects of yoga on premenstrual syndrome among college girl	Moos Menstrual Distress Questionnaire (MMDQ, 4 <sup>th</sup> Edition)	10 weeks, 6 days a week, 45 min each session
Vaghela N et al., (2019) [20]	Parallel group randomised trial	72 women (16-45 years of age), Aerobic grp: 34, yoga grp:38	To compare the effect of yoga and aerobic exercise on premenstrual syndrome	Visual Analog Scale (VAS), PMS Scale (PMSS)	4 weeks, 3 times a week, 40 min each session

Ghaffarilaleh G et al., (2019) [21]	Control randomised clinical trial	54 women (20-45 years of age), EG:26, CG:28	To study the effect of yoga on quality of sleep of women with premenstrual syndrome	Premenstrual Symptom Screening Tool (PSST), Pittsburgh Sleep Quality Index (PSQI) Questionnaire, Demographic Questionnaire	10 weeks, 3 sessions a week, 60 min each session
Ghaffarilaleh G et al., (2019) [22]	Control randomised clinical trial	54 women (20-45 years of age), EG:26, CG:28	To study the effect of yoga on anxiety and vital signs of women with premenstrual syndrome	Premenstrual Symptom Screening Tool (PSST), Hamilton Anxiety Rating Scale (HARS)	10 weeks, 3 sessions a week, 60 min each session
Nandia JRD (2022) et al., [23]	Single group experimental study	38 Childbearing	To determine the effect of yoga on anxiety and sleep quality during premenstrual syndrome	Anxiety level standard Questionnaire (HRS-A) Sleep Quality Standard Questionnaire (PSQI)	1 month, 2 times a week, 45 min each session
Prakash KC and Bhandary S (2022) [24]	Retrospective Pre and Post, mixed method study	41 women (28.12±6.92 age)	To check the status of premenstrual syndrome before and after yoga practice	Numeric Pain rating scale with Visual Analog Scale, Validated PMSS	Duration not specified
Sahu R and Barnwal SL (2022) [25]	Randomised control design	60 girls (14-17 years of age) 30EG and 30 CG	To evaluate the effect of yogic intervention on premenstrual syndrome among adolescence	MOOS Menstrual Distress Questionnaire (MSDQ)	10 weeks, every day, 45 min each session
Chang HC et al., (2023) [26]	Cluster randomised trial	128 women (20-40 years of age) EG:65, CG:63	To evaluate the effect of yoga in coping with premenstrual symptoms	DRSP (Daily Record of Severity of Problems)	12 weeks, 3 times a week, 30 min each session

**[Table/Fig-3]:** Description of the study characteristics, measurements and interventions [11,16-26].

EG: Experimental group; CG: Control group

have been grouped into two categories: Psychological (including emotional) and Physical (including physiological) Symptoms. [Table/Fig-4] summarises the effect of yoga on the Psychological (including Emotional) symptoms of premenstrual syndrome. [Table/Fig-5] shows the relationship between yoga and physical (including physiological) symptoms of yoga.

The 12 studies included in this systematic review investigate the effect of yoga/yoga intervention, commonly comprising yogic practices like Sookshvyayama, Asanas, Pranayama, Meditation, and Shavasana, on common symptoms as well as premenstrual syndrome as a whole.

Yoga was found to have a positive effect on physical symptoms (n=2) [17,20], physical functions (n=1) [16], and autonomic responses (n=2) [22,25] without separate evaluation in these studies. Yoga was found to be effective in improving physical symptoms like abdominal swelling/bloating (n=3) [16,19,25], breast tenderness (n=1) [16], fatigue (n=1) [26], cold sweats (n=1) [16], weight gain (n=1) [16], pain (n=5) [16,19,20,24,25], overeating/food cravings (n=2) [18,26], and pulse rate (n=1) [17]. In one study by Tsai SY (n=1) [16], yoga was found to be ineffective on the following physical symptoms: muscle stiffness, dizziness, backache, headache, skin allergies, nausea/vomiting, diarrhea, constipation, weight loss, and fatigue.

Symptoms	Wu WL et al., (2015) [11]	Tsai SY, (2016) [16]	Bharati M (2016) [17]	Kamalifard M et al., (2017) [18]	Lata P and Lohan U (2018) [19]	Vaghela N et al., (2019) [20]	Ghaffari-laleh G et al., (2019) [21]	Ghaffarilaleh G (Sept/oct et al., (2019) [22]	Nandia JRD et al., (2022) [23]	Prakash KC and Bhandary S (2022) [24]	Sahu R and Barnwal SL (2022) [25]	Chang HC et al., (2023) [26]
Irritability/ anger	-	Ineffective	-	↓	-	-	-	-	-	-	-	↓
Depression/ hopelessness	-	Ineffective	-	↓	-	-	-	↓	-	-	-	↓
Crying/ sensitivity	-	Ineffective	-	↓	-	-	-	-	-	-	-	↓
Tension/ stress/anxiety	-	Ineffective	-	↓	-	-	-	↓	↓	-	-	-
Loss of interest	-	-	-	↓	-	-	-	-	-	-	-	↓
Concentration/ attention	↑	-	-	↓	↑	-	-	-	-	-	↑	↑
Negative effects	-	-	-	-	↓	-	-	-	-	-	↓	-
Mental health	-	↑	-	-	-	-	-	-	-	-	-	-
Behavioural changes	-	-	-	-	↓	-	-	-	-	-	↓	-
Arousal	-	-	-	-	↓	-	-	-	-	-	↑	-
Control	-	-	-	-	↓	-	-	-	-	-	-	↓
Sleep problems	-	-	-	↓	-	-	↓	-	-	-	-	-
Quality of sleep	-	-	-	-	-	-	↑	-	↑	-	-	-
Fear	-	-	-	-	-	-	-	↓	-	-	-	-
Impaired personal/ social functioning	-	-	-	-	-	-	-	-	-	-	-	↓
Emotional stability	-	Ineffective	-	-	-	-	-	-	-	-	-	-

**[Table/Fig-4]:** Effect of yoga on psychological symptoms [11,16-26].

Physical symptoms	Wu WL et al., (2015) [11]	Tsai SY, (2016) [16]	Bharati M (2016) [17]	Kamalifard M et al., (2017) [18]	Lata P and Lohan U (2018) [19]	Vaghela N et al., (2019) [20]	Ghaffarilaleh G et al., (2019) [21]	Ghaffarilaleh G et al., (2019) [22]	Nandia JRD et al., (2022) [23]	Prakash KC and Bhandary S (2022) [24]	Sahu R and Barnwal SL (2022) [25]	Chang HC et al., (2023) [26]
Abdominal swelling/ bloating	-	↓	-	-	↓	-	-	-	-	-	↓	-
Breast tenderness	-	↓	-	-	-	-	-	-	-	-	-	-
Fatigue	-	Ineffective	-	-	-	-	-	-	-	-	-	↓
Pulse rate	-	-	↓	-	-	-	-	-	-	-	-	-
Cold sweats	-	↓	-	-	-	-	-	-	-	-	-	-
Weight gain/ loss	-	Ineffective	↓	-	-	-	-	-	-	-	-	-
Pain	-	↓	-	-	↓	↓	-	-	-	↓	↓	-
Physical function	-	↑	-	-	-	-	-	-	-	-	-	-
PMS symptoms	-	-	↓	-	-	↓	-	-	-	-	-	-
Autonomic responses	-	-	-	-	-	-	-	Effective	-	-	Effective	-
Overeating/ food craving	-	-	-	↓	-	-	-	-	-	-	-	↓
Muscle stiffness	-	Ineffective	-	-	-	-	-	-	-	-	-	-
Dizziness	-	Ineffective	-	-	-	-	-	-	-	-	-	-
Backache	-	Ineffective	-	-	-	-	-	-	-	-	-	-
Headache	-	Ineffective	-	-	-	-	-	-	-	-	-	-
Skin allergies	-	Ineffective	-	-	-	-	-	-	-	-	-	-
Nausea/ vomiting	-	Ineffective	-	-	-	-	-	-	-	-	-	-
Diarrhoea	-	Ineffective	-	-	-	-	-	-	-	-	-	-
Constipation	-	Ineffective	-	-	-	-	-	-	-	-	-	-

**[Table/Fig-5]:** Effect of yoga on physical/physiological symptoms [11,16-26].

Yoga has been found to have a positive effect on improving psychological symptoms like irritability/anger (n=2) [18,26], depression/hopelessness (n=3) [18,22,26], crying/sensitivity (n=2) [18,26], tension/stress/anxiety (n=3) [7,22,23], loss of interest (n=2) [18,26], concentration/attention (n=5) [11,18,19,25,26], arousal (n=1) [25], control (n=2) [19,26], sleep problem (n=2) [18,21], quality of sleep (n=2) [21,23].

Positive effects of yoga on negative effects (n=2) [19,25], mental health (n=1) [16], and behavioural changes (n=2) [19,25] of premenstrual syndrome were observed when symptoms were not evaluated separately. Yoga positively affected the impaired personal, social, and workplace functioning in a study (n=1) [26], whereas in another study (n=1) [16], yoga was found ineffective on the following symptoms of premenstrual syndrome: irritability/anger, depression/hopelessness, crying/sensitivity, tension/stress/anxiety, and emotional stability.

## DISCUSSION

A total of 12 studies were reviewed, which included 703 women. The studies evaluated the effect of yoga on premenstrual syndrome. The results of this review indicate that yoga is effective in relieving premenstrual symptoms in women. Even the two comparative studies included in this systematic review concluded that yoga is more effective than administering oral calcium [17] or doing aerobic exercises [20]. Although yoga is effective in improving many physical and psychological symptoms, its efficacy on all premenstrual symptoms is not proven. The yoga modules used as an intervention by each researcher were different in all eight studies [11,16,19-21,25,26]; therefore, it is difficult to conclude which module is best

suited for premenstrual syndrome. Not all studies have mentioned the type of yoga or module incorporated in their research; hence, it cannot be concluded which form or module of yoga practice works better in dealing with premenstrual syndrome. Duration and repetitions of yoga intervention also differed in these studies, but all 12 studies have reported success in improving at least one or more symptoms of PMS. No results of research included in this review reported to have completely failed in improving the symptoms of premenstrual syndrome.

Health-related quality of life is negatively affected due to the prevalence of physical premenstrual symptoms (abdominal swelling, fatigue, backache, and abdominal cramps), resulting in decreased occupational productivity. Relief from premenstrual pain [24] has been reported in the literature, which resulted in the enhancement of most dimensions of the Short Form 36-Item (SF), such as physical functions, bodily pain, general health perception, vitality/energy, social function, and mental health [16]. Yoga provides a moderate degree of exercise or toning to the body and can be adopted as a healthy lifestyle adjunct. Physical distress can cause absenteeism from college in young girls. The wellbeing of female students by encouraging them to engage in yoga can improve their work efficiency [17]. Slowly stretched muscles decrease muscle pain during premenstrual syndrome, and yoga strengthens these muscles and increases their flexibility [18].

The literature mentions the regulation of Leptin during the menstrual cycle, which increases during premenstrual syndrome and is responsible for controlling emotional behaviour. High levels of Leptin in circulation are associated with the psychological symptoms of premenstrual syndrome. Exercise is known to reduce blood Leptin levels. Physical exercises and yoga movements have many



similarities and differences. In most outcomes, yoga movements are equal or superior to physical exercises. Yoga exercise was reported to be better than aerobic exercise in relieving PMS symptoms [20].

Practicing yoga has a significant beneficial effect on the quality of sleep [21,23]. The hormones affecting sleep include Serotonin, norepinephrine, L-tryptophan, and acetylcholine. A drop in estrogenic levels during the luteal phase decreases serotonin levels, affecting the quality of sleep during premenstrual syndrome [23]. A woman's body tolerates hormonal fluctuations during the menstrual cycle, which results in physical, emotional, and behavioural symptoms. Levels of Gamma-aminobutyric acid (GABA) play a critical role in managing anxiety, and yoga increases the level of GABA, respective factors, which are aggression and anxiety [22,23]. Yoga was found to improve anxiety scores negatively with no effect on vital signs [22].

### Limitation(s)

The studies included in this review had heterogeneous study designs and yoga intervention characteristics, such as the type and form of yoga and duration. Due to these differences, the findings from these studies might be biased. While every effort was made to obtain all relevant data, the authors were unable to access articles that were not in English, whose full text was not available, or were not free to access. Therefore, the possibility of publication bias cannot be excluded.

### CONCLUSION(S)

Regardless of the differences in the intervention plan, yoga can be considered effective in improving physical and psychological symptoms. Further studies are required to investigate the effects of yoga on women suffering from premenstrual syndrome, given the limited number of articles in this area. Evaluating premenstrual symptoms separately using appropriate tools will lead to more accurate and specific outcomes. Additionally, it is recommended that further studies be conducted to evaluate the impact of different forms of yoga on PMS. Standardisation of yoga protocols related to specific symptoms and severity of premenstrual symptoms is suggested so that they can be easily prescribed to women.

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