

## Harmonizing the menstrual cycle: A review on pranayama practice in menstrual disorders management

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*Received: 05.10.2025 Revised: 15.11.2025*

### Abstract:

Menstrual abnormalities are prevalent issues for women, and they lead to physical and psycho-biological issues. The interplay of hormones in the hypothalamus-pituitary ovarian axis causes menstruation. There is increasing evidence of a relationship between psychosocial stress and menstruation-related health problems in women, showing that stress may alter menstrual function. Pranayama is beneficial for alleviating menstrual issues due to its ability to improve mental focus and induce a sense of calm. Deep breathing exercises (DBE) like Kapalbhathi, Bhastrika, and Nadi-Shodhan pranayama have been revealed in studies to be a collection of breathing modules that can also serve as an alternative sort of treatment for primary dysmenorrheal syndrome. The objective of this study is to present a review of papers over the last ten years that discuss how pranayama can be used as a complementary treatment for psychological and physiological variables in menstruation problems.

Literature was searched from 2013 to 2023 using various resources, including the Cochrane Library, PubMed, and Google Scholar. Many research on the effects of pranayama on psychological factors such as stress, anxiety, quality of life, BMI, hemoglobin (Hb), and menstrual disorder symptoms like dysmenorrhea, oligomenorrhea, premenstrual syndrome, and menopause are included in this review. This article provides a comprehensive evaluation of the results of research on pranayama as a complementary therapy for psycho-physiological factors related to menstrual disorders. Results point to the possibility of implementing pranayama as a complementary therapy to enhance mental and physical well-being during menstruation issues.

**Keywords:** Yoga, Pranayama, Menstrual Disorder, Breathing exercises.

### Introduction

The important aspect of a woman's life cycle is her menstrual cycle during the menstrual cycle, which a woman

experiences once a month, a sequence of hormonal changes starts (Jadhao, 2019). Menstrual disorders are common problems faced by women, who contribute to physical

and psycho-biological difficulties (Rani et al., 2016). Women's menstrual periods with the onset of adolescence, and menstrual cycles are commonly disrupted during the early years. A typical menstrual cycle lasts between 24 and 38 days and is regular, lasting between 5 and 8 days. Typically, between 5 and 80mL of blood are lost (Onieva-Zafra et al., 2020). Menstruation is triggered by the interaction of hormones in the hypothalamus-pituitary ovarian axis (Aggarwal et al., 2020). Menstrual problems come in many different forms. Issues can vary from painful, heavy periods to none at all. Menstrual patterns vary widely, but generally speaking, women should be concerned if their periods continue longer than 10 days or if they occur less frequently than 21 days or more frequently than 3 months apart. Such occurrences might indicate ovulation issues or other illnesses (Begum et al., 2016). Menstrual problems affect 87% of women (Sangeetha et al., 2023). Dysmenorrhea, menorrhagia, amenorrhea, irregular cycle, and premenstrual syndrome (PMS) are menstrual illnesses. Dysmenorrhea is the most common gynecological condition in women, affecting 60% to 93% of the population (Sangeetha et al., 2023). A connection between women's menstrual-related health issues and psychosocial stress is becoming more and more apparent, suggesting that stress may have an impact on menstrual function (BR et al., 2015). Yoga is a comprehensive word that describes many different kinds of exercises, although its Sanskrit root means 'yoke' or union (Singleton, M., & Goldberg, E., 2013). Yogic practices consist of asanas (physical exercises), pranayama (breathing exercises), and dhyana (meditation), including yoga-nidra (a type of guided relaxation practice) (Oates, 2017). Pranayama should be considered as an intervention for college students to improve menstrual well-being, as

it has been shown to enhance quality of life, reduce stress, and decrease absenteeism. It strengthens, enhances, and multiplies lung capacity and function. It promotes positive thinking, quiets mental chatter, and fortifies the body's defense systems. Pranayama increases mental focus and promotes relaxation, making it useful in the managing menstruation diseases. Hot flashes are frequently brought on by psychological stress. During menopause, deep abdominal breathing techniques and relaxation can help reduce mild to severe hot flashes (Kulkarni et al., 2021). Numerous researchers have demonstrated that regular yoga practice is therapeutic, restorative, and preventative. Researchers have found that a variety of pranayamas can have positive effects on autonomic systems (Beldar & Bhati, 2020). Yoga positively influences the menstrual cycle and psychobiological well-being, likely by balancing the neuroendocrine axis (Vaghela et al., 2019). Deep breathing exercises (DBE) such as Kapalabhati, Bhastrika, and NadiShodhan pranayama have been shown in studies to serve as an alternative treatment for primary dysmenorrhea (Kanchibhotla et al., 2023). After yoga, patients who suffered from menstruation disorders reported significantly lower blood pressure, postural hypotension, maintained handgrip, and HR expiration inspiration ratio (Mooventhan & Nivethitha, 2020). College women who experience PMS can benefit from yoga as it has been shown to regulate their psychophysiological responses at various stages of the menstrual cycle (Bera et al., 2017). The immediate effects of NS pranayama in the ratio of 1:3:2 increased parasympathetic activity and can be used in therapeutic settings primarily for health promotion and stress reduction, which helps prevent disease by promoting a relaxed mental state (Saisupriya et al., 2020).

## **MATERIALS AND METHODS**

The present review was conducted based on present scientific and yogic literature from multiple sources and authors. Literature was sourced from databases such as Cochrane Library, PubMed Central and Search engine Google Scholar. Published scientific papers (clinical studies, comparative studies, and randomized control trials) in English were included from January 2013 to December 2023. Keywords identified were ‘Pranayama’ and ‘Menstrual Disorders’. (Please refer figure 1)

### **Selection**

The process of selecting articles involved a sequential screening of the full-text articles, abstracts, study designs, and titles, all of which were evaluated to determine eligibility at a certain level.

### **Inclusion criteria**

This review study included full-text research articles from English-language journals on the topics of pranayama, yoga, and

menstrual problems. The studies covered females in all age groups who experienced menstrual-related issues.

This review also included numerous studies on the effect of pranayama on a variety of psychological factors, including stress, anxiety, well-being, quality of life, BMI, hemoglobin (Hb), and symptoms associated with menstrual disorders, such as dysmenorrhea, oligomenorrhea, premenstrual syndrome, and menopause. This article included distinct types of pranayama that lessen numerous symptoms linked with menstrual disorders to review the impact of pranayama on psychological and physiological factors in menstrual disorders

### **Exclusion criteria**

The review did not include conference abstracts, books, systematic review papers, theses, or dissertations. The study also excluded research papers in other languages except English.

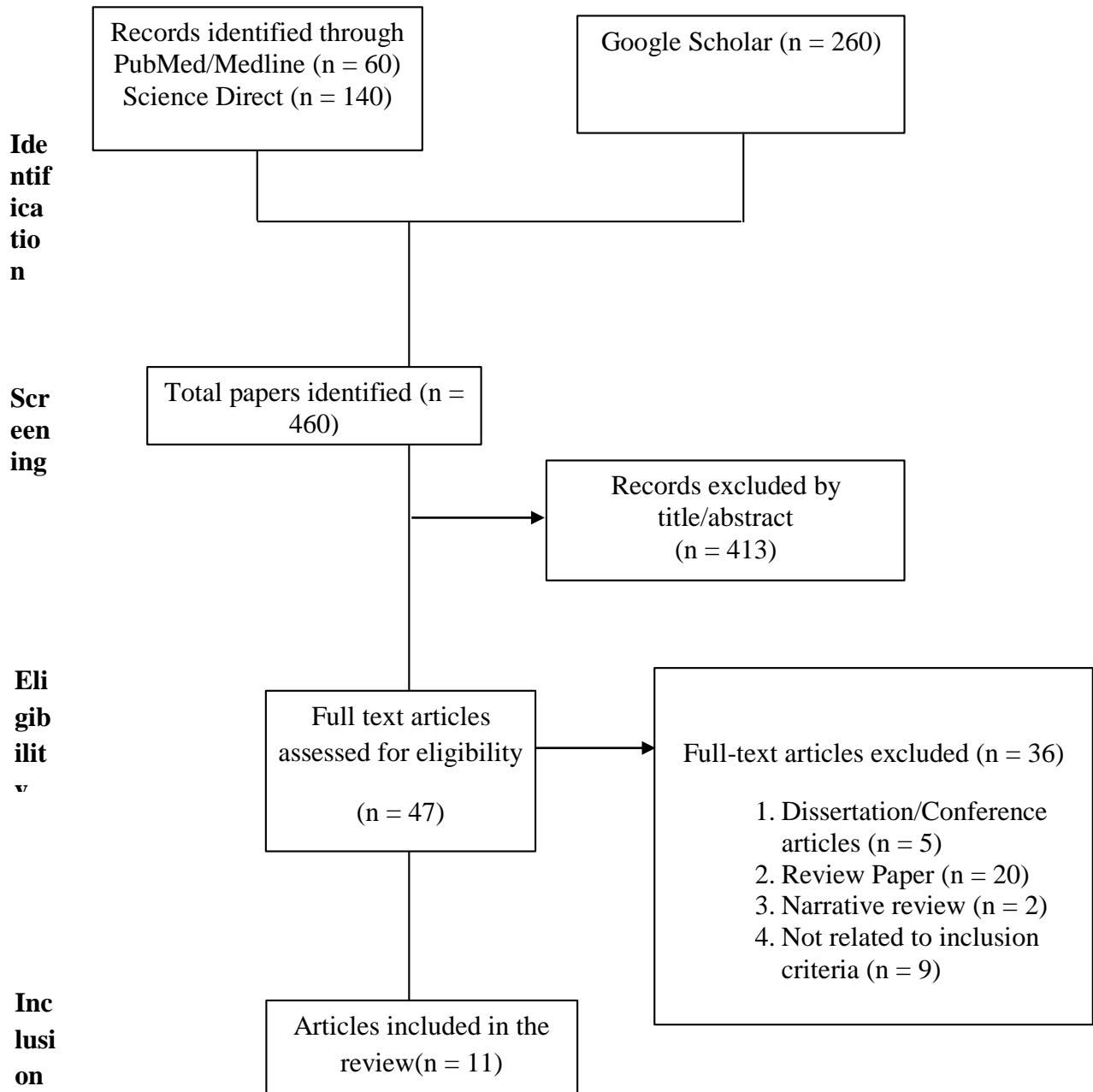


Figure 1: Showing the Search Strategy Followed for the review

## RESULTS

A total of 11 studies were included in this review article, after searching three databases i.e., Google Scholar, PubMed, and Science Direct. 460 results were identified (Google Scholar =260, PubMed =60, Science Direct = 140). A total of 11 studies fulfilled our criteria, others were excluded as some studies did not match the keywords “Yoga or Pranayama or Menstrual disorders”, Non-English articles were also excluded, 22 articles were excluded as they were review papers, only original research articles were included in this review paper.

The most popular instruments for assessing the impact of menstrual irregularities on mental and physical well-being were BMI, stress, anxiety, quality of life questionnaires, and hemoglobin (HB) during the cycle. The study's sample sizes ranged from 10 to 100, with the majority of the 20–50 age group females.

## DISCUSSION

A comprehensive assessment of pranayama as an adjunctive treatment for psychophysiological factors affecting women's health is given in this review. The analysis encompassed a range of female age groups, including those experiencing premenstrual syndrome (PMS) and menopausal syndrome.

Effect of Pranayama on Premenstrual Syndrome (PMS)

Overall, 11 research papers were included in this study where 5 papers discuss the effect of yoga on the premenstrual syndrome, these papers demonstrated significant effect of Pranayama on premenstrual symptoms. (Refer to table 1)

From 10-15 years old female participants were included in this study from the Punjab region, where participants were divided into 2 different groups, 50 participants from the experimental group took intervention of different types of pranayama (eg. Bhastrika, Bharamri, Anulom-Vilometc) for five

months, the effect was measured using the Premenstrual Scale developed by Gencodogan, which showed a significant effect at the  $P < 0.01$  level in this study (Banwal & Siddiqui, 2022). One of the study included factors like blood pressure and heart rate during premenstrual syndrome and after 3 months of intervention of pranayama experimental group participants had good control on premenstrual syndrome along with high basal sympathetic activity in comparison with the control group, few studies showed comparative effect of asanas with pranayama, where 3 groups were divided between the age group of 18-40 years female participants in group A (no intervention), B group (Anulom-Vilom Pranayama), C group (yogic asana), the result showed significant difference ( $P > 0.05$ ) between groups which means group B and C showed positive effect in comparison with group A (Sharma et al, 2014) (Goyal et al, 2016). Another study connected pranayama with Siddha holistic approach, this approach includes pranayama as an excellent method for the prevention of lifestyle-related disorders, this study was conducted with 10 unmarried postgraduate students (age 25-27), and data was collected by DSM 5 (Premenstrual syndrome questionnaire) describe who pranayama decrease premenstrual symptoms, and also pranayama included with all yogic intervention where combination of other yogic intervention with pranayama reduced premenstrual syndrome and tension, these studies utilized various assessment tools, including a sphygmomanometer, electromyogram, DSM-5 questionnaire, and the Women's Health Assessment Questionnaire (WHAQ) to measure premenstrual syndrome, heart rate, and blood pressure (Sivasankaran et al, 2018) (Chaudhary & Mishra, 2013).

Effect of Pranayama on Dysmenorrhea

This review paper included four studies that discuss about the effect of pranayama and yoga practice on females suffering from dysmenorrhea associated with some psychological variables (quality of life, stress, anxiety, mental alertness) and physiological variables (Pain, back discomfort, nausea, diarrhea).

A four-week study conducted with adolescent girls who were suffering from dysmenorrhea was assigned to three groups. Group A, performed 3 specific asanas, group B performed Anulom-vilom, and group C got combination of those two intervention protocols. Combinations of asana and anulom-vilom show more effective results than other groups (Aggarwal et al., 2020). Another research conducted on physiotherapy girl's students suffering from dysmenorrhea. This comparative study examines the effects of slow phase (Nadishodhan) and fast phase (Kapalbhati) Pranayama on quality of life and pain during primary dysmenorrhea. Conducted through a randomized controlled trial, subjects were divided into two groups. The results showed a significant improvement ( $P < 0.0001$ ) in quality of life and pain in Group A compared to Group B, indicating that Nadishodhana practice is more effective than Kapalbhathi for managing primary dysmenorrhea (BR et al., 2015).

Another research was also a comparative study using a randomized controlled trial. A total of 44 participants were divided into

two groups: the first group received instruction in Pranayama, while the second group received instruction in Surya Namaskara. The analysis, using the Mann-Whitney test, showed a Z value of -2.119 with a P value of 0.03, indicating a significant difference in the effectiveness of Pranayama compared to Surya Namaskara in reducing dysmenorrhea pain, with Pranayama being more effective (Widiastini et al., 2023a).

Additionally, another study described the effect of yoga on selected risk factors among adolescent girls aged 18 to 22 suffering from dysmenorrhea. After 12 weeks of practicing yoga, the experimental group showed a reduction in body weight and an improvement in general mental alertness (Geetha & Elangovan, 2022).

#### **Effect of Pranayama on Menopause and Other Menstrual Disorders**

Menopause indicates age-related decrease in endocrine function of the ovaries, generally menopause occur after age of 45-55 years, a study on 30 women with the intervention of Bharamari Pranayama show highly significant improvement in psychological symptoms also improved quality of life, stress, and mental health<sup>[11]</sup>. One of the studies, also represented the result in favor of pranayama and included it as a relaxation technique to deal with psychological and physical changes women face during all types of menstrual disorders<sup>[2]</sup>.

**Table 2: Review table for the included studies with research design, age and outcome**

Author (years)	Study design	Age groups (sample size)	Intervention	Tools	Results
Sharma et al., 2013 <sup>[17]</sup>	Pre-post experimental control study	18-40 (60)	Anulom- vilom (Group B), specific asana(Usttrasana, adho-mukhsvanasna, Group c), No intervention (Group C)	Sphygmomanometer,HR, EMG, GSR, Respiratory rate	Anulom – vilom pranayama and yogic asnas has shown relaxation responses in female suffering from Premenstrual syndrome(PMS)
Aggarwal et al., 2020 <sup>[4]</sup>	Randomized control trail (RCT)	18-22(36)	Anulom- vilom (Group A), Bhujangasana, Marjarasana and Matsyasana(Group B), combination of both asana and pranayama (Group C)	Numerical pain rating scale(NPRS), Verbal Multidimensional Scoring System(VMSS), SF-12questionnaire	For primary dysmenorrhea, combining yogasanas with pranayama technique is more beneficial than employing just one of the two intervention protocols.
Sivasankaran et al., 2018 <sup>[18]</sup>	A clinical study	25-27(10)	Pranayama practice according to siddha system	Premenstrual Syndrome Questionnaire	The frequency and severity of premenstrual syndrome symptoms is significantly reduced when pranayamam is practised during this period of time.
Beldar , 2020 <sup>[11]</sup>	A clinical study	45-55(30)	Bharamari Pranayama	Physical and psychological assessments with experts	Menopausal syndrome can be effectively managed with BhramariPranayam, as it is a very safe and efficient therapeutic modality.
Ganesh et al., 2015 <sup>[7]</sup>	Randomized clinical trail	18-25(90)	Slow phase pranayama	Moos menstrual distress questionnaire (MM DQ),	Comparing Slow pranayama

			(Nadisodhan) and Fast phase pranayam (Kapalbhati)	Numerical pain rating scale for pain(NPRS),Quality of life scale	(NadiShodhan) to Fast pranayama (Kapalbhati), the quality of life and pain scores improved, suggesting the benefits of Slow pranayama for Primary Dysmenorrhea.
Choudhary,2013 <sup>[19]</sup>	Randomized control trail (RCT)	22-35(32)	Yoga technique (Asan, Pranayam&dhyana)	WHAQ (The Women Health Assessment Questionnaire)	The results suggest at the possible benefits of yoga poses, pranayama, and dhyana in reducing premenstrual symptoms and decreasing premenstrual stress and syndrome.
Banwal, 2021 <sup>[20]</sup>	Comparative study	10-50(100)	Pranayam	Premenstrual syndrome scale developed by Gencdogan(2006)	Result shown positive significant effect of paranayama practice on premenstrual syndrome
(Geetha &Elangovan), 2022 <sup>[21]</sup>	Randomized control trail (RCT)	18-22(40)	Hatha Yoga practice with Pranayama	Physical test and QOL test	The result showed that yogic practices(asana, pranayama and relaxation technique) are reduced body weight and improve general mental alertness
Widiastini Et al., 2023 <sup>[22]</sup>	Randomized control trail (RCT)	13-17(44)	Pranayama &Suryanamskara	Numeric Rating Scale (NRS)	The level of dysmenorrhea pain that can be reduced by combining Pranayama and Surya Namaskar yoga, with Pranayama yoga being more beneficial than Surya Namaskar yoga.



Goyal et al.,2013 <sup>[23]</sup>	Comparative study	18-45(50)	Pranayama	Sphygmomanometer, HR	Result showed significant reduction in blood pressure and hart rate in premenstrual syndrome
Rani et al., 2016 <sup>[2]</sup>	Randomized control trail (RCT)	18-45(100)	Yoga nidra& Pranayama	Psychological General Well-Being Index (PGWBI),	Menstrual dysfunction patients may benefit from yoga nidra, or yogic relaxation training, in addition to traditional medication therapy.

### Conclusion

The finding of this review indicate that pranayama is among the most effective yoga techniques for managing menstruation disorders, including dysmenorrhea,menorrhoea, menopause, and premenstrual syndrome. Research suggests that psycho-physiological issues are the most prevalent problems associated with menstrual illnesses, and Pranayama is a

simple method to harmonize the mind and body. The study also revealed that pranayama, when combined with certain asanas, helps regulate the menstrual cycle. Furthermore, this review indicates that pranayama improves quality of life, well-being, and hemoglobin during the menstrual cycle while lowering stress, anxiety, and BMI.

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