

Yoga As A Viable Non-Pharmacological Approach For Primary Dysmenorrhea: An In-Depth Review And Meta-Analysis

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ABSTRACT

Objective: Despite the historical marginalisation of women and the progress made in securing their legal rights, primary dysmenorrhea continues to present difficulties that impact women's physical and emotional health. This meta-analysis investigates yoga's effectiveness as a non-pharmacological treatment for primary dysmenorrhea.

Method: A systematic review utilising Shodhganga, Research Gate, and PubMed was carried out in accordance with PRISMA standards on studies published from 2010 to 2023. Primary dysmenorrhea and effective yoga therapies were the main inclusion criteria. Studies that were not experimental or that dealt with other forms of dysmenorrhea were not included.

Results: Twenty studies are included in the meta-analysis, which highlights yoga's effectiveness in easing the symptoms of primary dysmenorrhea. Across a wide range of demographics, asanas, pranayamas, and meditation dramatically reduce menstruation discomfort and enhance general wellbeing.

Discussion: Yoga has been shown to have a persistent good impact on general development, stress levels, and pain reduction. As a non-pharmacological intervention, it is a safe and effective choice for managing primary dysmenorrhea. The utilisation of an Android app for yoga relaxation and the possibility of increasing beta-endorphin levels through a yoga-murottal intervention are noteworthy findings.

Conclusion: Yoga is a valuable, all-encompassing, and reasonably priced treatment for primary dysmenorrhea since it treats the mental and physical components of the condition. The evidence base has to be strengthened by larger, more diversified populations and more research using standardised procedures. For the reduction of menstruation discomfort, yoga provides a specialised and scientifically supported approach.

Keywords: Dysmenorrhea, primary dysmenorrhea, yoga intervention, beta-endorphin levels, mental well-being, quality of life.

INTRODUCTION

History demonstrates that women have always been labelled as the "Weaker Section" of society and criticised for being who they are due to the design and functionality of their reproductive system ("Ethics of Divorce in Ancient India," 1931), (Terborg-Penn, 1998). Because of a widespread lack of information about this complex topic, early civilizations were probably not always friendly to menstruating women (Rosenzweig, 1943), (Phipps, 1980). Women were granted the same legal rights as males upon their liberation, but what about the symptoms they experience during the cycle? (Jaggar, 1974). They must be resilient enough to endure suffering without experiencing negative side effects in order to obtain equal rights (Amering, 2022).

Young women frequently worry about irregular uterine flow and menstrual diseases. Menstruation problems include dysmenorrhea (excessive discomfort during periods), oligoamenorrhea (absence or irregularity during periods), and menorrhagia (prolonged and profuse bleeding during periods) (Ryan, 2017).

Menstrual Disorders and Dysmenorrhea

Any irregular alteration in a woman's menstrual cycle is referred to as a menstrual disorder, while dysmenorrhea is a word used to describe an uncomfortable menstrual cycle that is accompanied by symptoms that vary from person to person and include nausea, vomiting, cramps, dizziness, and stomach discomfort (Doneley, 2016). Almost 45–95% of women worldwide who are menstruating suffer from dysmenorrhea, a gynaecological disorder (Proctor & Farquhar, 2006). Women are primarily affected by this on her "days," since it limits her ability to go about her regular activities and thus many school-age girls miss their school in order to cope with the pain (Eryilmaz et al., 2010), (Joshi et al.,

2015). Dysmenorrhea causes abrupt mood changes that make a person feel unhappy and exhausted during their period. It also has a negative impact on their mental health and quality of life, making them feel like "good for nothing" (Iacovides et al., 2015). They would rather relax at home than keep up with their hectic schedules, which causes them to miss their work and school (Miraglia & Johns, 2016).

Types of Dysmenorrhea

Dysmenorrhea mainly have two types: Primary Dysmenorrhea and Secondary Dysmenorrhea (French, 2008).

Primary dysmenorrhea is basically caused by excess secretion of prostanoids and eicosanoids generated by the endometrium during the time of menstruation and cyclooxygenase inhibitors and estrogen-progestin oral contraceptive tablets can be effective treatments for it (Dawood, 2006). In other words, primary dysmenorrhea is a term for frequent, recurrent menstrual cramps that are unrelated to any other medical problem. Pain usually begins 1-2 days prior to the onset of menstruation and is experienced in the lower abdomen, back, or thighs. Pain can range in intensity from mild to severe, last for 12 to 72 hours, and be accompanied by additional symptoms. Primary dysmenorrhea usually appears three years after menarche, during adolescence, though each case is unique (Deligeoroglou, 2000), (Borkowski, 2020), (Israel, 1965). The secondary form of dysmenorrhea are linked to adenomyosis and endometriosis. Adenomyosis and endometriosis are two common tertiary causes of dysmenorrhea that can be ruled out with ultrasound confirmation of the diagnosis, which is suspected based on the medical history and physical examination. Non-steroidal anti-inflammatory medicines can be used as a stand-alone treatment or in combination with progestins or oral contraceptives (Bernardi et al., 2017).

Numerous studies indicate that yoga may be able to reduce primary dysmenorrhea symptoms (Yang & Kim, 2016). Yoga has been researched for its potential advantages in reducing menstruation discomfort and enhancing general well-being as a mind-body activity (Büssing et al., 2012), (Gonçalves et al., 2016).

Yoga and Menstrual Health

With roots that go back thousands of years on the Indian subcontinent, yoga is an ancient discipline which is similar to physical activity that has become a global phenomenon that millions of people have embraced in search of their bodily, psychological, immunity and spiritual well-being (Department of Botany Govt. PG Autonomous College, Rishikesh et al., 2019), (P K & Sai Sailesh, 2018) (Kumar & Jhaharia, 2018). Since the primary goal of yoga is to harmonise the three aspects of one's being, the name "yoga" comes from the Sanskrit term "yuj," which means to yoke or combine (V Binorkar, 2014). Although yoga includes a wide range of techniques, at its core it is a holistic approach that incorporates control of one's breath, meditation, and moral concepts in addition to physical postures to promote a well-rounded and integrated lifestyle (Manchanda, 2014), (Na;, 2008). Rather than being just a series of poses, yoga is a whole system designed to develop awareness of oneself, mindfulness, and one's connection to the world (Ramirez-Duran et al., 2022). Here are a few ways that yoga could help with primary dysmenorrhea:

Relaxing Muscles: To help ease tension and cramping, certain yoga postures and techniques concentrate on opening up and releasing the pelvic muscles (Ghoncheh & Smith, 2004).

Reduces Stress: Yoga reduces stress, which is believed to aggravate menstrual symptoms, by emphasising meditation, mindful breathing, and relaxation (Tellhed et al., 2019), (Brown & Gerbarg, 2009).

Enhanced Circulation: Yoga postures frequently call for mild bending and twisting, which encourages blood flow to the pelvic area among other portions of the body and reduced menstrual pain may be a result of improved circulation (Field, 2011).

Balances the Hormones: Research indicates that yoga might have an impact on hormonal balance. Menstrual pain is influenced by hormonal swings, which yoga may help to control (Chhabra, 2021).

Mind-Body Relation: By promoting consciousness and acceptance of physical experiences, yoga promotes a mind-body connection and with that women may be better able to manage and deal with menstrual discomfort as a result of this enhanced awareness (Douglass, 2010).

Mental Well-Being: Yoga has a beneficial effect on mental health, which includes lowering depression and anxiety. Reduced perceptions of pain may be indirectly influenced by improved mental wellness (De Manincor et al., 2016). Since yoga has been mentioned in a number of studies as an alternative therapy to lessen the consequences of primary dysmenorrhea, the goal of this meta-analysis is to identify the safest and most effective course of treatment for this issue that works naturally.

Need of the Study

A lot of women suffer from dysmenorrhea; therefore, finding efficient, non-invasive treatments is essential for enhancing their quality of life (Hsu et al., 2003). For a number of reasons, further research is needed to determine whether yoga is a useful treatment for dysmenorrhea (Kirca & Celik, 2023). Yoga has demonstrated potential in lowering menstruation pain and related symptoms because of its diverse approach, which includes bodily poses, breathing techniques, and meditation (Tsai, 2016). Careful investigation contributes to the scientific validation of these reported advantages, giving medical practitioners a strong basis on which to suggest yoga as an adjunctive or alternative therapy (Novryanthi & Nurhayati, 2021), (Nag, 2013). Furthermore, knowing the precise processes via which yoga works to promote well-being might help to customise interventions and improve the creation of individualised treatment programmes (Gupta, 2021).

Yoga is a holistic practice that treats mental and emotional as well as physical manifestations of dysmenorrhea, providing an integrated strategy for controlling menstrual pain (Roshi, 2017). The field's research advances evidence-based medicine by enabling patients and healthcare professionals to make well-informed decisions regarding the integration of yoga into their dysmenorrhea treatment plans (Ko et al., 2016). However, there is currently insufficient data to support the use of yoga as a non-pharmacological alternative treatment for primary dysmenorrhea. As a result, more research is required to raise awareness about how convenient, simple, safe, and affordable this therapy is. It also has the potential to be a life-changing treatment for those who are afflicted with this issue and are unable to find relief. For this reason, an effort has been made to gather the best available studies, with a focus on specifically demonstrating the effectiveness of yoga as a primary dysmenorrhea treatment.

Method

This study was carried, accomplished, and planned in compliance with PRISMA guidelines. Using the databases on Shodhganga, Research Gate and PubMed, a comprehensive search for literature was conducted. The literature review was conducted using keywords like: “Yoga OR Meditation OR Relaxation OR Beta-endorphin OR Pranayama OR Dysmenorrhea OR Primary dysmenorrhea OR Perceived Stress.”

Through database searching, a total of 1822 records were found; however, only 35 records were chosen after title and abstract screening; among the 35 publications, only 20 relevant records were chosen for this meta-analysis. This evaluation looked at 20 studies that used human subjects and were completed by 2023.

Inclusion Criteria

1. Studies completed between 2010-2023 were taken.
2. Experimental studies that were especially concentrated on the disorder of primary dysmenorrhea.
3. Studies adopting yoga as an intervention i.e., yoga as an alternative therapy, in its entirety, or as a component that consists either a combination or one of the following: asanas, pranayamas, and meditation.
4. Studies showing a successful reduction in dysmenorrheal pain were included.

Exclusion Criteria

- Studies published prior to 2010 were not included.
- Non-experimental studies were excluded.
- Studies related to other forms of dysmenorrhea other than its primary form were excluded.

Table 1 Scientific evidence

Author	Sample Size	Intervention	Results	Conclusion	Measures	Comments
1. (Vasantha, 2020)	300 adolescent females (150 in the study group, 150 in the control group)	A three-month yoga training program for the experimental group.	13.3% of the females in the experimental group reported severe pain, compared to 79.3% who reported moderate pain before the yoga programme. Afterwards, all 150 girls (100%) reported having mild symptoms of dysmenorrhea.	It was discovered that yoga is beneficial in lowering primary dysmenorrhea symptoms in teenage girls.	Pretesting utilising a standardised questionnaire was done on the experimental and control groups.	According to the study, practicing yoga can help manage dysmenorrhea and improve students' physical and emotional health, attendance at school, and focus in the classroom.
2. (C, 2010)	145 females (86 in the	Yoga and educational	Pre-test results (mean and standard deviation) for the study	The study comes to the	Phase II of the study	According to the study,

	research group, 59 in the control group).	interventions, with the study group receiving yoga training.	and control group respectively: (2.197, 0.732)(1.949, 0.797) Post-test results for the study and control group respectively: (0.453, 0.566) (1.830, 0.967)	conclusion that adolescent girls' overall development was positively impacted by both yoga and educational treatments and successfully lower pain and stress levels.	employed a quasi-experimental design without a control group that underwent the same pre- or post-test procedures. The pre-test and post-test findings were analysed using the mean and standard deviation.	adolescent girls' perceived stress levels can be lowered and primary dysmenorrhea can be effectively managed by combining yoga and educational treatments.
3. Nag (2013)	113 medical students (53 in the control group, 68 in the study group).	Yoga, pranayama, and meditation for three months in the study group.	While 83.33% of the participants in the research group reported total pain remission, 11.66% of the group experienced little discomfort. Absenteeism dropped to 10.3% while no pain decrease was seen in the control group.	The study comes to the conclusion that yoga, breathing exercises, and meditation can be useful complementary therapies for young students with primary dysmenorrhea (PD).	The Numerical Rating Scale for Pain was used in conjunction with semi-structured questionnaires that were given out at the beginning and three months later.	Finding suggests that yoga, pranayama, and meditation can greatly improve everyday activities and lessen pain perception and related stress among medical students.
4. Masters Program in Applied Midwifery, School of Health Sciences, Guna Bangsa Yogyakarta et al. (2019)	60 female students from Muhammadiyah High School in Yogyakarta.	A 30-minute yoga treatment using an online Android application was given to both the control group and the yoga relaxation exercise group in this quasi-experimental study.	The pain was measured using the Numerical Rating Scale. The control group's mean difference in pain reduction was 0.95, while the intervention group's mean difference was 1.73.	According to the study's findings, treating dysmenorrhea using an Android app for yoga relaxation is a good idea because it lowers pain perception and encourages relaxation.	The Wilcoxon test was utilised to analyse the data after the pain was measured using the Numerical Rating Scale.	The results indicate that using an Android application to incorporate yoga relaxation activities can be a helpful and convenient way for controlling discomfort associated with dysmenorrhea in female teenagers.
5. Sumarni et al. (2022)	30 female respondents were taken for this study.	A valid study was conducted wherein a control group was given analgesic medicine and an experimental group was given yoga-murottal twice a week during their menstrual cycle.	The study analysed pain differences between experimental and control groups, intending to detect greater beta-endorphin levels in the intervention group. The outcomes showed that yoga-murottal raised beta-endorphin levels and successfully decreased dysmenorrhea pain.	According to the study's findings, yoga-murottal helps teens experience less discomfort from dysmenorrhea and have higher levels of beta-endorphins.	Blood samples and observational sheets were used to gather data.	According to the results, yoga-murottal intervention may be an effective way to treat dysmenorrhea pain and may also have an impact on teenagers' beta-endorphin hormone levels.
6. Chien et al. (2013)	30 women with primary dysmenorrhea and 30 healthy controls were taken.	A prospective controlled experiment with both groups receiving yoga intervention twice a week for 30 minutes over eight weeks.	There was no statistically significant distinction observed between the control and study groups; however, after the yoga intervention, the homocysteine levels in the control group decreased by 46.46% and in the study group by 51.37%.	After eight weeks, yoga treatment may help to lower blood homocysteine levels and alleviate dysmenorrheal pain, which may help to restore endothelial	Short-form Menstrual Distress Questionnaires (MDQs) were used, and blood samples measured homocysteine levels.	According to the study, yoga interventions may help to improve vascular health by lowering homocysteine levels and relieve dysmenorrheal symptoms.

<p>7. Kirca & Celik (2021)</p>	<p>60 volunteer female students (30 in the study group, 30 in the control group).</p>	<p>A 12-week (3 months) randomised experimental trial that involved a once-weekly yoga programme was carried out for the study group.</p>	<p>Within the study group, a statistically significant variation in pain levels was noted but the variation in pain levels among the control group was not found to be statistically significant.</p>	<p>function. According to the study's findings, yoga can be a useful intervention for primary dysmenorrhea patients' pain management.</p>	<p>Three forms were used to collect data: the "Personal Information Form," the "Visual Analogue Scale" (VAS), and the "Dysmenorrhea Monitoring Form." Based on the degree of their pain, participants assigned a number on the VAS scale.</p>	<p>The results support the use of yoga as an effective intervention for primary dysmenorrhea by indicating that a once-weekly 12-week programme can dramatically reduce pain levels in affected persons.</p>
<p>8. Azim (2019)</p>	<p>20 of the 60 students (chosen from various colleges connected to Vidyasagar University, Paschim Mediniur) are in the yoga group.</p>	<p>Empirical investigation using a four-monthly training yoga group.</p>	<p>Following a 4-month training period, the yoga group experienced a 54.55% reduction in pain, greater than the exercise group or the combined yoga and exercise groups.</p>	<p>The study comes to the conclusion that yoga is more advantageous for treating Primary Dysmenorrhea (PD), not only by lowering pain but also by addressing other dysmenorrhea-related issues. Patients should practise yoga on a regular basis.</p>	<p>Using the questionnaire approach, students who were single, had never exercised, and had been experiencing PD for the previous four months without taking medication were among the selection criteria.</p>	<p>With a notable decrease in pain and possible holistic advantages, the results lend credence to the notion that yoga is a helpful intervention for the management of issues associated to dysmenorrhea, regular yoga practice is advised.</p>
<p>9. (Rakhshae, 2011)</p>	<p>A control group (42 girls) and an experimental group (50 girls) were randomly allocated to 92 girls, ages 18 to 22.</p>	<p>Three yoga positions (fish, cat, and cobra) are tested in a randomised clinical research to see if they can help with primary dysmenorrhea (PD) during their menstrual cycle's luteal phase.</p>	<p>Yoga poses were reported to lessen the severity and length of PD, and significant differences were seen in the pain intensity and duration in the post-test compared to the pre-test in the yoga group.</p>	<p>According to the study, yoga postures—cobra, cat, and fish poses in particular—are a secure and easy way to lessen the intensity and length of primary dysmenorrhea.</p>	<p>Participants were assessed for three menstrual cycles using a questionnaire approach and a visual analogue scale for pain.</p>	<p>The results validate the clinical effectiveness of particular yoga postures in reducing PD symptoms, providing a simple and safe solution for people with menstruation discomfort.</p>
<p>10. (Yang & Kim, 2016)</p>	<p>40 nursing undergraduates were split into two groups at random: the exercise group and the control group (20 in each).</p>	<p>A single-blind, randomised, controlled study was carried out once a week for 12 weeks, or three consecutive menstrual cycles, to assess the benefits of a 60-minute yoga programme with relaxation techniques, meditation, and physical modules.</p>	<p>The experimental group saw a substantial decrease in menstrual pain intensity scores when compared to the control group.</p>	<p>The study comes to the conclusion that yoga interventions, such as physical modules, meditation, and relaxation techniques, may help female undergraduate students with primary dysmenorrhea effectively lessen their monthly discomfort and cramps.</p>	<p>The Menstrual Distress Questionnaire and the Visual Analogue Scale for Pain were utilised for evaluation.</p>	<p>The results provide credence to the potential advantages of a comprehensive yoga programme that incorporates relaxation methods and meditation for reducing menstrual pain and discomfort in female undergraduate students with primary dysmenorrhea.</p>

11. (Julaecha et al., 2020)	33 females were taken.	Purposive sampling in a quasi-experimental, single-group pre-posttest study design. Participants received a yoga movement programme for two menstrual cycles in a row.	5.8 (1.6) was the pre-test mean pain scale and the mean score following the yoga programme was 2.7 (1.3), suggesting a noteworthy decrease in the intensity of menstrual discomfort.	The study comes to the conclusion that yoga poses are a safe alternative therapy for reducing dysmenorrhea-related pain.	The assessment of pain was done using a numerical rating scale, and data analysis was done using a repeated Anova test.	The results validate the potential efficacy and safety of yoga as a substitute therapy for reducing menstrual pain in women with dysmenorrhea, including teenagers who do not participate in sports.
12. (Agre & Agrawal, 2021)	75 females, with 60 subjects recruited for the study.	Pre-post intervention study consisting of two groups: Group B (yogasana group) and Group A (isometric exercise group). For eight weeks, group B practiced 5 days/week beginning on the 5th day of the cycle, held for 15 to 30 sec. and completed five times.	A noteworthy distinction was noted in the group comparison between Group B (yogasana) and Group A (isometric activity) and yoga has been shown to be more beneficial than isometric exercises as an alternate therapy for PD.	The study comes to the conclusion that yoga and isometric exercises can both be used as complementary therapies to lessen PD, with yoga showing to be more successful.	The Moos Menstrual Distress Questionnaire was employed as the outcome measure, and Microsoft Excel was used for data analysis.	The results indicate that, when compared to lower limb and abdominal isometric exercises, adding yoga specifically, yogasanas may be a more successful alternative therapy for controlling PD.
13. (Sa'adah et al., 2019)	76 adolescents were taken for this study.	Two groups, the experimental and the control were used in this quasi-experimental study at the Darul Falah Islamic Boarding School receive yoga instruction for one month, twice a week for 40 minutes each.	Reduction in the experimental group's dysmenorrhea pain intensity as compared to the control group.	The study comes to the conclusion that adolescents with dysmenorrhea pain can benefit from using hatha yoga as a non-pharmacological treatment.	Univariate and bivariate analysis were performed, along with the use of an observation sheet as a measurement tool and a random sample technique for participant selection.	According to the research, practicing hatha yoga for a month may help reduce the intensity of dysmenorrhea pain in teenagers and offer a non-pharmacological method of treating the condition.
14. (Devi et al., 2019)	20 female adolescents, divided equally into two groups.	Control design and pre-test post-test groups are used in experimental research designs. A three-week yoga intervention is conducted twice a week.	Using a numerical rating scale, the mean difference before and after the intervention was 4.90 and 3.00, respectively, showing decrease in menstrual pain with significant results of t-test.	The study finds that yoga can be regarded as a safe therapy for female adolescents with Primary Dysmenorrhea (PD) and is effective in lowering discomfort.	The t-test, mean difference, and numerical rating scale are employed in data analysis.	The results back up the use of yoga as a safe and effective treatment for PD in female teenagers experiencing menstrual pain.
15. (Ulaa et al., 2020)	88 responders, of which 41 were in the	Non-equivalent pre-test post-test control	Numerical rating scale was used and with a mean of 1.49, yoga was found to be more helpful	The study finds that self-tapping and yoga both	The Mann Whitney test, the Wilcoxon	The results imply that self-tapping and

	control group and 47 were in the experimental group.	group design in a quasi-experimental study. The control group was given self-tapping, and the experimental group received yoga intervention.	clinically than self-tapping, which had a mean of 0.46.	work well to relieve persistent dysmenorrheal pain, with yoga working better than self-tapping.	data analysis tool, and the Numerical Rating Scale were all utilised to assess pain.	yoga can both be helpful in treating prolonged dysmenorrhea however, based on the results, yoga is thought to be more useful clinically.
16. (Yonglitthipagon et al., 2017)	34 volunteers, aged 18 to 22, evenly split between two groups.	A 12-week randomised controlled study in which a yoga group participated in twice-weekly, daily yoga sessions lasting 30 minutes each. The group under control did not engage in any physical activity.	After 12 weeks, there was a substantial improvement in period pain, quality of life (QOL), and physical fitness in yoga group compared to the control group where the Visual Analogue Scale, Kolmogrov-Smirnov test, and ANCOVA test were used.	The study finds that menstruation discomfort, quality of life, and physical fitness can all be significantly improved by using yoga as a supplemental treatment for Primary Dysmenorrhea (PD).	Menstrual pain evaluation using the Visual Analogue Scale; data analysis using the ANCOVA and Kolmogrov-Smirnov tests.	The results corroborate the potential advantages of yoga as an adjunctive intervention for controlling PD, improving young women's general quality of life and physical fitness in addition to menstruation discomfort.
17. (Nuryaningsih & Rosyati, 2022)	66 elementary school pupils in sixth grade (33 in the yoga group and 33 in the control group).	Study that used a non-equivalent control group design and was quasi-experimental. During the first three months of the menstrual cycle, the group practised yoga.	The Wong Baker Pain Rating Scale was used to assess pain resulting statistically significant difference between the yoga and control groups in the 2 nd and 3 rd months, as well as a significant reduction in the duration and intensity of dysmenorrhea discomfort in the yoga group over the preceding 3 months.	Yoga dramatically reduced the duration and intensity of dysmenorrhea pain among sixth-grade primary school pupils at the Rusunawa Health Centre.	For assessment and statistical analysis, the Wong Baker Pain Rating Scale, Friedman test, Mann-Whitney test, and Ordinal Regression test were employed.	According to the study, yoga can be a useful complementary therapy for easing the discomfort of dysmenorrhea in sixth-grade elementary school students. This information can help midwives encourage yoga in their workplaces.
18. (Geetha & Elangovan, 2022)	30 randomly chosen girls, aged 18 to 22, suffering from dysmenorrhea (15 in the control group and 15 in the experimental group).	An experimental group that underwent six days a week of yogic practices for a period of 12 weeks was part of a random group experimental investigation, whereas the control group engaged in active rest.	Based on the measurements of monthly frequency scores obtained from pre-test and post-test, yoga practices significantly reduced menstruation frequency in the Experimental Group when ANCOVA was employed for statistical analysis.	Yogic techniques helped adolescent girls with dysmenorrhea experience significantly fewer menstrual cycles.	Menstrual frequency scores are calculated, and statistical analysis is done using ANCOVA.	The study provides evidence for prospective treatment approaches by demonstrating how yoga practices can effectively reduce the frequency of menstruation in teenage girls suffering from dysmenorrhea.
19. (Sari, 2018)	20 adolescent girls out of the 27 responders in total were taken for the study.	Pre-post design research investigating the impact of yoga poses, particularly suryanamaskar, on the pain associated with dysmenorrhea.	A pain scale with a range of 0 to 10 is employed for evaluation, T-test on paired samples is used to analyse the data and after therapy, the average pain score dropped by 3.5 points and there was a change between the pre and post-treatment periods.	Incorporating breathing, movement, and relaxation techniques, the yoga Suryanamaskar movement successfully decreased the pain associated	Assessment is done using a pain scale (0–10), and data analysis is done using a paired sample t-test.	According to the study, teens' dysmenorrhea pain may be lessened by the Suryanamaskar movement in yoga by combining several techniques and

				with dysmenorrhea in teenage girls.		releasing endorphins.
20. (Sharma & Gurprasad, 2019)	30 female participants were taken.	Two groups participated in a quasi-experimental study: Group B performed yoga poses while Group A got physical therapy. On the day 1 and 2 of periods, interventions were administered.	Following treatment, gross measurements considerably improved in both groups, although there were no discernible differences between the groups receiving yoga therapy and physiotherapy.	Neither physiotherapy nor yoga therapy was a better treatment than the other; both produced an instant improvement in the symptoms of primary dysmenorrhea (PD).	Gross measurements are applied in evaluations.	According to the study, people with PD can select between physiotherapy and yoga therapy depending on their preferences or suitability. Both therapies are successful in relieving PD symptoms quickly.

Abbreviations used in this meta-analysis:

PD: Primary Dysmenorrhea; VAS: Visual Analogue Scale; MDQ: Menstrual Distress Questionnaire; ANCOVA: Analysis of Covariance; ANOVA: Analysis of Variance.

Results

This study included a total number of 20 studies conducted between the year 2010 and 2023 that involved human participants.

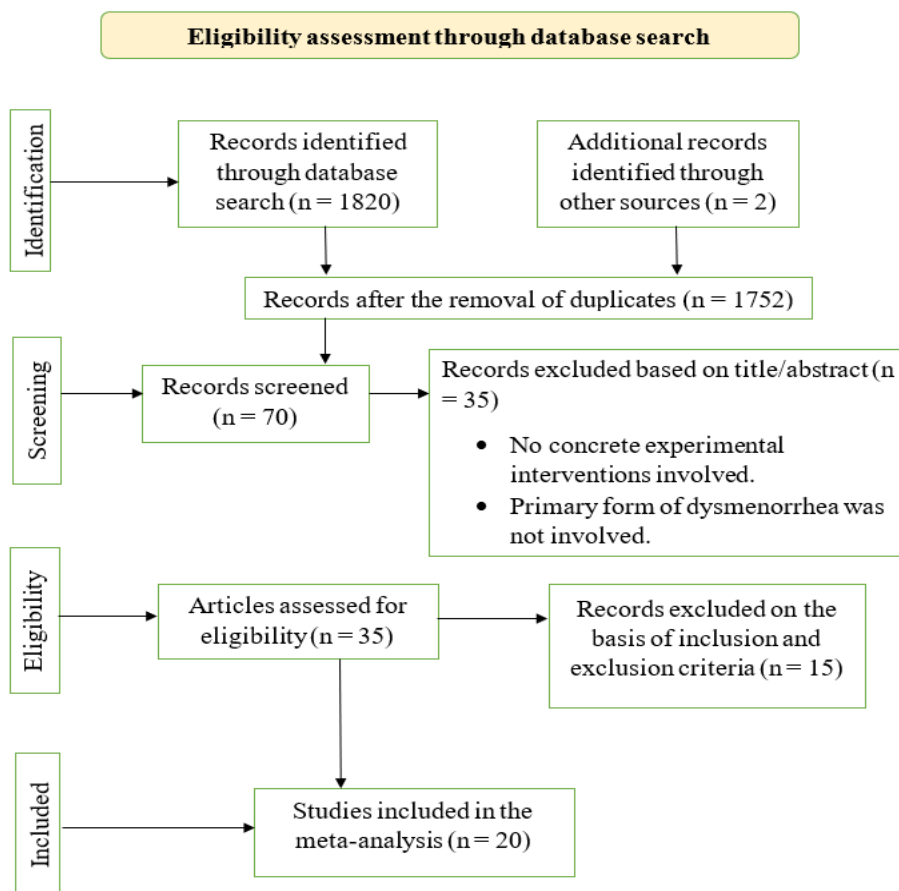


Fig. 1. Flow diagram showing the selection process of studies

Discussion on Finding

The paper presents a comprehensive synthesis of multiple studies investigating dysmenorrhea and menstrual disorders, indicating that non-pharmacological interventions, including yoga, meditation, and relaxation techniques, can effectively alleviate menstrual pain and discomfort.

For instance, studies conducted by (C, 2010) & (Nag 2013) demonstrated that both yoga and educational treatments positively impacted the overall development of adolescent girls, leading to reduced pain and stress levels. Another study by (Sa'adah et al., 2019) revealed that engaging in hatha yoga for a month may contribute to a decrease in the intensity of dysmenorrhea pain among teenagers, offering a non-pharmacological approach addressing the condition.

Similarly, a study by (Devi et al., 2019) involving teenagers experiencing menstrual pain found that a three-week yoga intervention conducted twice a week effectively reduced discomfort.

A fascinating study by Sumarni et al. (2022) highlights the potential of yoga-murottal intervention as an effective and comprehensive treatment for menstrual discomfort. It suggests that yoga-murottal intervention, given twice every week during the period of menstruation, effectively raises beta-endorphin levels and reduces pain associated with dysmenorrhea in teenagers.

Furthermore, a study (Masters Program in Applied Midwifery, School of Health Sciences, Guna Bangsa Yogyakarta et al. 2019) suggested that utilizing an Android app for yoga relaxation to manage dysmenorrhea is beneficial, as it diminishes pain perception and promotes daily activities, thereby reducing pain perception and related stress among medical students.

In summary, the collective findings of these studies underscore the effectiveness of non-pharmacological interventions such as yoga, meditation, and relaxation techniques in managing menstrual pain and discomfort. These interventions offer a safe and convenient approach for alleviating discomfort and enhancing the quality of life for women grappling with menstrual disorders.

Limitations

Although the body of research indicates that yoga is effective in treating dysmenorrhea, there are a few drawbacks. The approach, sample sizes, and durations of the interventions in the examined studies may differ, which could impact how broadly applicable the results are. Subjectivity is also introduced by the use of self-reported measurements, and any biases in participant recruitment and selection processes may have an effect on how strong the evidence is overall. To improve the scientific foundation for incorporating yoga into the treatment of dysmenorrhea, it is stressed that more rigorous, standardised research techniques are required, including randomised controlled studies involving larger and more varied populations.

Conclusion

The evaluated literature concludes that yoga is a consistently successful strategy for controlling primary dysmenorrhea in a variety of demographics, including young adults and adolescents. Yoga has promise in reducing pain, promoting emotional stability, and improving overall quality of life in a variety of contexts. It efficiently tackles the mental and physical aspects of menstrual discomfort, whether it is used in a traditional manner or through online apps. The compelling positive results of the studies that have already been conducted underscore the necessity of further research delving deeper into the mechanics and complexity of treating primary dysmenorrhea with yoga. This will enable the development of more individualised and evidence-based interventions aimed at improving the quality of life for those who are experiencing menstrual discomfort. Overall, yoga is shown to be a thorough and approachable method, paving the way for its widespread integration into the all-encompassing treatment of primary dysmenorrhea.

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Conflict of interest

There are no conflicts of interest between the authors.

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