VER
Vascular & Endovascular Review

Effect Of Exercises On Females With Premenstrual Syndrome

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ABSTRACT

Premenstrual syndrome (PMS) encompasses a range of physical, emotional, psychological, and behavioural symptoms that recur cyclically—typically during the late luteal phase—and ease off within two to four days after menstruation begins. Premenstrual dysphoric disorder (PMDD) refers to a more severe, disruptive subgroup of premenstrual disturbances, identified through specific diagnostic criteria to reflect its intensity. In India, PMS affects nearly half of women in reproductive age, with an estimated prevalence of 43–48% among adolescent and college-aged groups. However, research focusing on working women remains scarce. One study conducted in South India among a professional cohort reported that about 48% of working women experienced PMS, and for 35% of them, symptoms significantly impaired their quality of work life Given this landscape, our study aims to examine and compare the prevalence of PMS among exercising and non-exercising women aged 18–25, specifically targeting working women within this demographic in India.

KEYWORDS: Menstrual Syndrome, Exercise, Women's Health, Pain.

How to Cite: Neha Deshmukh, Shweta Pachpute, Gururaj Kulkarni, Sachin Bhagat, Amol Madavi, Harshad Mayaramani, (2025) Effect Of Exercises On Females With Premenstrual Syndrome, Vascular and Endovascular Review, Vol.8, No.12s, 283-287.

INTRODUCTION

Premenstrual syndrome (PMS) is a women's health condition marked by recurring physical, emotional, psychological, and behavioral symptoms in the late luteal phase that resolve 2–4 days after menstruation begins (1). According to the American College of Obstetricians and Gynecologists (ACOG), a diagnosis requires at least one affective and one somatic symptom that impair social, academic, or work functioning (2).

Physical activity—any energy-expending movement by skeletal muscles—is recognized globally by the WHO (2022) as a public health priority, with benefits including enhanced brain health, weight management, disease prevention, stronger musculoskeletal systems, and improved daily functioning (3,4). However, men tend to be more active than women (5). The term Premenstrual Dysphoric Disorder (PMDD) emerged to describe a severe, disruptive form of PMS. According to the DSM-5, PMDD involves intense behavioral symptoms (e.g., irritability, depressed mood, anger, confusion, social withdrawal) along with physical complaints (e.g., weight gain, musculoskeletal pain, headaches, breast tenderness, and abdominal bloating/pain) (3,6,7)

Exercise not only promotes physical fitness and social interaction but may also lessen depressive symptoms and mitigate PMS manifestations (8–10). In one study of 600 women (mean age of 25 ± 2.4 years, mostly urban postgraduates), 36.2% had moderate-to-severe PMS and 12.2% had PMDD—totaling a 48% positive PMS screen via the PSST (11,12). The most frequent symptom among those affected was anger/irritability (99%), with 31% rating it severe; tearfulness/sensitivity to rejection was most often severe (48%). The authors emphasized that exercise significantly influences both the prevalence and severity of PMS symptoms

as well as research outcomes (13).Given its affordability, adaptability, and capacity to enhance women's health, exercise is increasingly viewed as a viable adjunct therapy. It may help by boosting

endorphin production and lowering cortisol, thereby increasing pain tolerance and reducing anxiety, depression, and other PMS-associated challenges (14,15).

Meta-analysis from Iran revealed PMS prevalence at 70.8% (16), while global data suggest up to 75% of women experience PMS at some point in their lives (17). Approximately 80% of reproductive-aged women encounter distressing luteal-phase symptoms monthly, and 30–40% find these symptoms significantly disruptive to daily life (1,18).

Despite the high prevalence—estimated at 48% in India—most Indian studies focus on adolescents or college students. Research targeting working women remains sparse (19). In response, our study investigates the prevalence of PMS among exercising and non-exercising working women aged 18–25 (20).

MATERIAL AND METHODS

It is a Cross-sectional observational study conducted on 18 to 25 years old college going menstruating girls both engaged and not engaged in any regular physical activity or exercise in the outpatient department, Nagpur. The study was conducted for duration of 6 months in which 149 samples were collected by using convenient sampling. The Exclusion criteria for the study is Presence of any medical condition that could interfere with the participation, use of medications known to affect menstrual cycle regularity or PMS symptoms, Pregnancy or lactation, inability to understand and comply with the instructions, using any hormonal contraceptive or hormonal replacement therapy. Outcome measure used is premenstrual syndrome scale with inter-rater reliability between 0.91 and 0.97. It is evaluated under 3 major components like physiological symptoms, psychological symptoms and behavioural symptoms. It has forty different items which was graded from 1 to 5. Total score ranges from1 to 200 which further graded in the percentage from which we interpreted it as no symptoms, mild, moderate, severe and very severe symptoms (21). To compare the severity of PMS (categorical variable: mild, moderate, severe, etc.) of two groups (exercising vs. non-exercising) chi square test is utilized. To compare ordinal data or non- normally distributed PMS scores between two independent groups (exercise vs. no exercise) Mann-Whitney U test was utilized. To describe how many participants belong to each PMS severity category in each group Descriptive Statistics was utilized.

RESULTS

The figure 1 presents the distribution of individuals based on whether they are exercising or not. A majority of 100 individuals (67.11%) are exercising, indicating that more than half of the group is engaged in physical activity. On the other hand, 49 individuals (32.88%) are not exercising, representing a smaller portion of the group. This suggests that a significant portion of individuals are leading an active lifestyle, while nearly a third of the group is not involved in exercise.

Figure 1: Exercising or not exercising:

Figure 2: PMS Severity In Exercising Group

Table 1: PMS Severity in Non-Exercising Group

The figure 2 and 1 appears to present data on the symptoms experienced by individuals during exercise. Out of the total participants, 1 person (0.67%) reported no symptoms. The majority, 97 people (65.10%), experienced mild symptoms. Only 2 people (1.34%) reported moderate symptoms. The columns for severe and very severe symptoms seem to be empty or unrecorded. This data suggests that most individuals had only mild symptoms during exercise, with a very small percentage experiencing moderate symptoms, and no information was provided for severe cases.

Figure 3: PMS Severity in Non-Exercising Group

The results in figure 3 suggested a significant difference in symptom severity between individuals who exercise and those who do not. Among the non-exercising group, a small percentage (2.01%) reported moderate symptoms, while a higher percentage (5.36%) experienced severe symptoms. Notably, a substantial portion (25.50%) reported very severe symptoms, indicating that a significant number of non-exercising individuals face more intense health issues. In comparison, the exercising group experienced mostly mild or no symptoms, highlighting that physical activity may play a role in reducing the severity of symptoms. This could suggest that engaging in exercise might help mitigate some of the more serious health problems observed in the non-exercising group.

Figure 4: Comparison between exercising and non-exercising women

Table 2: Comparison between exercising and non-exercising women

The figure 4 and table 2 provides a distribution of individuals based on the severity of their symptoms. A small percentage, just 0.67%, report having no symptoms at all, indicating that only a very minor portion of the group is symptom-free. The majority, 90%, experience mild symptoms, of exercising which is the most common severity level, suggesting that most individuals face some form of discomfort but not in a severe manner. A smaller portion, 4.02%, report having moderate symptoms, while 5.36%

experience severe symptoms, showing that these levels of severity are relatively rare in both exercising and non-exercising. However, 38% of individuals report experiencing very severe symptoms, highlighting that a significant portion of the group is dealing with intense and challenging symptoms with non-exercising population

DISCUSSION

PMS is a cyclical condition that emerges during the luteal phase, causing physical, emotional, and behavioural issues that often disrupt daily life (1,17). Among women aged 18–25, nearly half experience PMS, with 20–40% reporting symptoms severe enough to interfere with social life (18)

Regular exercise is linked to a lower frequency and intensity of PMS symptoms (22). For example, active female college students—those achieving ≥ 3000 MET-minutes per week—report fewer physical complaints like cramps and bloating, as well as improved mood and reduced fatigue Conversely, low activity levels, higher BMI, poor mental health, and stress are tied to more severe PMS (8,20).

Exercise alleviates PMS through physiological and psychological pathways: it raises endorphins and serotonin, lowers cortisol, supports better sleep, balances hormones, improves circulation, and boosts energy (23). High-quality studies, including randomized controlled trials and systematic reviews, show promise in using aerobic exercise, yoga, resistance training, HIIT, and walking to reduce overall PMS symptoms (24). One meta-analysis found exercise reduced global PMS scores (SMD ≈ –1.08), with greater benefits seen in psychological, physical, and behavioural symptom clusters (25). Another review noted significant pain relief, decreased bloating and breast tenderness, and improved mood from practices like light walking and yoga (26)

Barbara et.al conducted a narrative review on PMS and exercise, concluding that although existing research remains limited, physical activity emerges as a promising non-pharmacological approach that extends benefits beyond menstrual symptom relief. Bauman et al., in their epidemiological review spanning 2000–2003, reinforced Australia's Physical Activity Guidelines, highlighting that 45–60 minutes of moderate exercise—particularly brisk walking—is essential for obesity prevention, while also offering strong evidence for diabetes prevention and growing support for enhancing mental, musculoskeletal, and cancer-related health (27). A systematic review and meta- analysis of randomized controlled trials by Pearce et al. (2020) found that exercise interventions of at least eight weeks significantly reduced overall PMS symptoms (SMD = –1.08) and showed even greater effects on psychological (SMD = –1.67), physical (SMD = –1.62), and behavioral (SMD = –1.94) symptom clusters, although the included studies varied in quality and displayed high heterogeneity (24).

Premenstrual Syndrome (PMS) encompasses a range of physical, emotional, and behavioral symptoms that occur cyclically during the luteal phase of the menstrual cycle, often impacting women's daily activities and quality of life (28). The prevalence and severity of PMS can vary based on several factors, including lifestyle habits such as physical activity. Studies indicate that a significant proportion of young women experience PMS. For instance, research focusing on women aged 18–25 reported a prevalence rate of approximately 49.2%, with 20–40% experiencing severe symptoms that adversely affect their social lives (29). Engaging in regular physical activity has been associated with a reduction in both the prevalence and severity of PMS symptoms. A study examining the relationship between physical activity and PMS among female college students found that higher levels of physical activity were linked to fewer PMS symptoms (30). Similarly, another investigation reported that women participating in regular exercise experienced fewer physical and psychological symptoms, such as pain, fatigue, and mood disturbances. Conversely, physical inactivity may contribute to the persistence or exacerbation of PMS symptoms (31). Research assessing the severity of PMS in relation to physical inactivity, body

mass index (BMI), mental state, and perceived stress levels found that sedentary lifestyles were significantly associated with more severe PMS symptoms. The beneficial effects of exercise on PMS symptoms can be attributed to several physiological and psychological mechanisms. Regular physical activity is known to enhance endorphin levels, improve mood, and reduce stress, all of which can mitigate the severity of PMS symptoms. Additionally, exercise promotes better sleep and increases energy levels, further contributing to overall well-being during the premenstrual phase (32). Further research is needed to explore the mechanisms by which exercise alleviates PMS symptoms and to assess the long-term benefits of incorporating physical activity into the management of PMS.

CONCLUSION

In conclusion, the findings suggest that engaging in regular exercise may help reduce the severity of PMS symptoms, making it an essential lifestyle recommendation for women experiencing premenstrual discomfort.

Declarations:
Ethical consideration

Ethical approval was received from the BORS Committee of Nagar Yuvak Shikshan Sanstha, Nagpur, Maharashtra, India (protocol number: DMCOP/2024/1301-U)

Consent to publish
All authors agreed on the content of the final paper.

Funding

None

Competing interest
The authors declare that there is no conflict of interest regarding the publication of this article

Author contribution
ND, SB and HM conceptualised the study. GK, AM and RA participated in the writing, review and editing of the manuscript. HM and RA were involved in data analysis and interpretation. All the authors reviewed and approved the manuscript for submission.

Acknowledgement-
The authors acknowledge the contributions of all the patients who consented to be part of this study

Availability of data
Data is available upon request to the corresponding author

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