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Prevalence and Severity of Premenstrual Symptoms Among Urban Working Indian Women: A Cross-Sectional Study

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Abstract

Background: Premenstrual Syndrome (PMS) affects many working women of reproductive age, but its prevalence and symptom patterns in urban Indian populations are not well characterized. This study aims to assess the prevalence and severity of premenstrual symptoms among working urban Indian women. **Methods**: A cross-sectional study was conducted among 67 women aged 23-39 from Mumbai and Delhi. Participants completed the Premenstrual Symptom Screening Tool (PSST) questionnaire by Steiner *et al*., for assessing the severity of 19 common premenstrual symptoms. Descriptive statistics were performed to examine symptom prevalence and severity. **Results**: The most commonly reported 'moderate to severe' symptoms were 'physical symptoms' (breast tenderness, headaches, joint or muscle pain, bloating and weight gain), 'fatigue or lack of energy' and 'anger or irritability' whereas 'Insomnia', decreased interest in home activities, difficulty in concentrating were found to be the least severe. **Conclusion**: This study provides insights into the prevalence and severity of premenstrual symptoms among urban working Indian women. The high rates of emotional and physical symptoms highlight the need for increased awareness and management strategies for PMS in this population. **Major Findings:** This study found that urban working Indian women commonly experience moderate to severe physical symptoms, fatigue and anger/irritability during their premenstrual phase. The symptoms significantly impact work efficiency, social relationships, and home responsibilities. Interestingly, hypersomnia was more prevalent than insomnia among the participants, suggesting a unique sleep disturbance pattern in these women.

Keywords: Premenstrual Symptoms, Premenstrual Syndrome, Urban Women, Working Women

1. Introduction

Premenstrual Syndrome (PMS) refers to a constellation of physical, emotional, and behavioral symptoms that occur cyclically during the luteal phase of the menstrual cycle and resolve shortly after the onset of menstruation[1,2]. Premenstrual syndrome arises from intricate interactions between hormones and neurotransmitters[3]. Fluctuations in estrogen and progesterone impact serotonin levels, influencing mood and physical manifestations[4]. Changes in the body's stress response system and heightened sensitivity to hormonal shifts also play a role in PMS development[5]. PMS affects a significant proportion of women of reproductive age worldwide, with prevalence estimates ranging from 20-40%[6]. Some research indicates that the prevalence could be as high as 75-85 % when including milder forms of PMS. Common symptoms of PMS include mood swings, irritability, breast tenderness, bloating, and fatigue. While PMS is recognized as a common health issue for women globally, its prevalence and symptom patterns may vary across different populations and cultures. Most large-scale epidemiological studies on PMS have been conducted

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in western countries, with limited data from developing nations, including India. Understanding the prevalence and characteristics of PMS in diverse populations is crucial for developing appropriate screening, diagnostic, and management strategies. In the past decade, research on Premenstrual Syndrome (PMS) among women in India has gained momentum, especially considering the country's rapid urban development and shifting social dynamics. A notable investigation by Mishra *et al*., in 2020 shed light on the prevalence of PMS in urban Indian settings[7]. Their findings revealed that nearly two-thirds of the women surveyed experienced PMS symptoms, with lifestyle factors playing a crucial role in symptom intensity. The study identified stress and dietary patterns as key contributors to PMS severity, underscoring the complex interplay between modern urban lifestyles and women's health. More recently, Raval *et al*., research delved into the more severe manifestation of premenstrual symptoms known as Premenstrual Dysphoric Disorder (PMDD)[8]. Their work unveiled that approximately one in five women of reproductive age in urban India met the criteria for PMDD. India's rapid urbanization and socioeconomic changes in recent decades have led to shifts in women's lifestyles, work patterns, and health behaviors. These changes may influence the experience and reporting of premenstrual symptoms. Urbanization and modernization can potentially alter how women perceive and communicate their premenstrual experiences. A study by Sharma and Gupta, focusing on India's urban female population revealed a complex relationship between city living and women's health[9]. While urban environments often provide improved healthcare accessibility, they also introduce distinct challenges that may intensify Premenstrual Syndrome (PMS) manifestations. However, there is a paucity of data on PMS among urban Indian women, particularly those in the workforce[9]. The few existing studies have focused primarily on adolescents or specific occupational groups, leaving a gap in our understanding of PMS prevalence in the general urban adult female population. A recent study by Singh and Patel examined Premenstrual Syndrome (PMS) in urban Indian working women, focusing on a specific metropolitan area[10]. While the investigation provided valuable insights, it had certain limitations in scope. The research did not encompass the complete spectrum of PMS symptoms or thoroughly assess their effects on day-to-day activities.

This study aims to investigate the prevalence and severity of premenstrual symptoms among urban Indian women in Mumbai and Delhi, two major metropolitan areas. By focusing on working women across various sectors and examining a comprehensive range of symptoms and their impact on daily life, this research will offer valuable insights into the experience of Premenstrual Syndrome (PMS) within the context of urban India's rapidly evolving socioeconomic landscape. The study will address existing knowledge gaps by providing a thorough analysis of PMS prevalence, symptom patterns, and associated factors among urban working Indian women. This comprehensive approach will contribute to the development of strategies for enhancing women's health awareness, improving diagnosis, and managing premenstrual symptoms in urban India

2. Materials and Methods

2.1 Study Design and Participants

The sample for this cross-sectional study comprised women employed in the service sector (healthcare, education, retail, hospitality, finance, and information technology), within the metropolitan areas of Mumbai and New Delhi, India. For sample size estimation, the sample size formula proposed by Zhong was used[11]:

N = sample size to be calculated

$Z\ (1-\alpha/2)$ = Z-statistics for type 1 error (1.96)

$Z\ (1-\beta)$ = Z-statistics for type 2 error (0.845)

δ = A clinically acceptable margin (5)

S^2 = Polled standard deviation of both comparison groups (11)

Participants were recruited through convenience sampling *via* social networks like Whats app, Linkedin, Instagram and Facebook, through an online screening process. Potential candidates completed a Google form questionnaire that assessed their self-reported symptoms and medical history. The selection was based on their responses, which were evaluated against the following predetermined inclusion and exclusion criteria.

2.2 Inclusion Criteria

1. Female professionals working in hospitals, banks, schools, *etc.,* in the service industry, involved in office-based roles and holding a minimum of a bachelor's degree.
2. Having a cycle lasting between 28 to 35 days.

3. Between 23 and 39 years of age.
4. Knowledge of English or Hindi for communication purposes.

The study focused on women aged 23 to 39, encompassing a key period of reproductive and professional development. The lower age limit ensures participants have likely completed their education and entered the workforce, while the upper limit helps exclude potential perimenopausal effects, which can emerge in the early 40s for some individuals. This range allows for a comprehensive examination of premenstrual symptoms across various career and life stages within the prime reproductive years.

2.3 Exclusion Criteria

1. Women with irregular menstrual cycles.
2. Expectant mothers.
3. Women diagnosed with chronic conditions like diabetes, high blood pressure, thyroid issues (both underactive and overactive) or tuberculosis, *etc*.
4. Women who were prescribed medication for a health issue within the last three months.
5. Lifestyle factors like women who smoke or drink alcohol regularly or women who have recently adopted a fitness routine in the past three months.

Women with irregular menstrual cycles were not included in the study, as the unpredictable nature of their cycles could hinder the precise identification and evaluation of premenstrual symptoms. Pregnant women were excluded from participation due to the cessation of menstruation during the gestational period. The study did not include participants with chronic health conditions such as diabetes, hypertension, or thyroid disorders, as these ailments can produce symptoms that may be mistaken for or overlap with PMS, potentially skewing the study's findings. Additionally, individuals who had taken prescription medications within the three months before the study were not eligible to participate, as certain pharmaceuticals can alter hormonal equilibrium and possibly affect the manifestation of PMS symptoms. Lastly, the study excluded participants with specific lifestyle factors, including those who regularly consume tobacco or alcohol, or who had recently implemented new exercise regimens. These factors were deemed exclusionary because they can autonomously influence mood, energy levels, and physical well-being, which could interfere with the accurate assessment of PMS-specific symptoms.

The study was approved by Shoolini University's Institutional Ethical Committee with the reference number SUIEC/23/02. Additionally, the study utilized the Premenstrual Symptoms Screening Tool (PSST) questionnaire (English and Hindi), by Steiner *et al.*[12] An academic research license agreement was obtained from McMaster University ("McMaster"). All participants provided informed consent before enrollment. Consent was collected through email and Whatsapp, using a specified format.

2.4 Data Collection

Data was collected through a google form questionnaire based on Steiner's PSST for premenstrual symptoms. Participants were asked to rate the severity of 19 common premenstrual symptoms experienced in the past 3 months. Symptoms in the PSST are categorized into emotional, physical, and behavioural domains. Severity is rated on a 4-point Likert scale: 0 = not at all, 1 = mild, 2 = moderate, 3 = severe. The questionnaire also included items on the impact of symptoms on daily functioning in work, social activities, and relationships. While the PSST has not been explicitly validated for use in India, it has been utilized in various cultural contexts beyond its original development, demonstrating its adaptability. Many premenstrual symptoms assessed by the PSST are considered relatively universal across cultures, though their expression may vary. Previous studies on premenstrual symptoms in India have employed the PSST, suggesting its acceptance in the Indian research community It is available in various languages for global application but our study used only the English and Hindi languages.

2.5 Statistical Analysis

Descriptive statistics were calculated for demographic characteristics and symptom severity ratings. The prevalence of each symptom was determined based on the proportion of women reporting any severity (mild, moderate, or severe).

All analyses were performed using microsoft excel.

2.6 Participant Characteristics

A total of 67 eligible women completed the study questionnaire. The mean age of participants was

31.64±5.27 years (range 23-39 years). Demographic characteristics are summarized in Table 1.

3. Results and Discussion

The prevalence and severity of the premenstrual symptoms based on the responses of 67 participants are presented in Table 2.

Table 1. Demographic characteristics of study participants (N=67)

Age Group	No. of Participants (n, %)
23-29 years	26 (38.80%)
30-35 years	20 (29.85%)
36-39 years	21 (31.34%)
City of Residence	
Mumbai	39 (58.20%)
Delhi	28 (41.79%)

3.1 Most Severe vs. Least Severe Symptoms of Premenstrual Syndrome

The data reveals that among the most severe symptoms experienced, 'Physical Symptoms', which include breast tenderness, headaches, joint or muscle pain, bloating and weight gain, stands out prominently, with 41 women at a moderate level and 13 at a severe level.

Equally significant are the symptoms of 'fatigue or lack of energy' with 40 women reporting moderate levels and 13 experiencing severe fatigue. 'Anger and irritability' also emerged as a major concern, with 36 participants indicating moderate levels and 10 experiencing severe symptoms in this category. These findings suggest that energy depletion, physical discomfort, and emotional volatility are the most impactful symptoms among those surveyed (Figure 1).

Among the symptoms analyzed, some appear to be less severe for the majority of respondents. 'Insomnia' stands out as particularly mild, with 28 women reporting

Table 2. Premenstrual symptoms prevalence and severity (N=67)

Symptoms	Not at all	Mild	Moderate	Severe
Anger or Irritability	0	21	36	10
Anxiety or Tension	6	21	34	6
Tearfulness or Increased sensitivity to rejection	12	23	21	11
Depressed Mood or Hopelessness	11	23	25	8
Decreased interest in work activities	12	16	27	12
Decreased interest in home activities	14	25	23	5
Decreased interest in social activities	13	25	19	10
Difficulty concentrating	17	19	28	3
Fatigue or Lack of energy	3	11	40	13
Overeating or Food cravings	15	21	22	9
Insomnia	28	29	7	3
Hypersomnia	14	19	27	7
Feeling over whelmed or out of control	14	25	20	8
Physical Symptoms: Breast tenderness, headaches, joint or muscle pain, bloating and weight gain	0	13	41	13
A) Interference with work efficiency or Productivity	6	21	35	5
B) Relationships with coworkers	17	20	27	3
C) Relationship with family	12	26	22	7
D) Social activities	9	31	24	3
E) Home responsibilities	10	34	20	3

no issues at all and 29 experiencing only mild symptoms. Similarly, 'Decreased interest in home activities' seems to be less problematic for many, as 14 women reported no decrease at all and 25 experienced only a mild reduction in interest. 'Difficulty concentrating' also falls into this category of less severe symptoms, with 17 respondents reporting no difficulties and 19 experiencing only mild concentration issues (Figure 2).

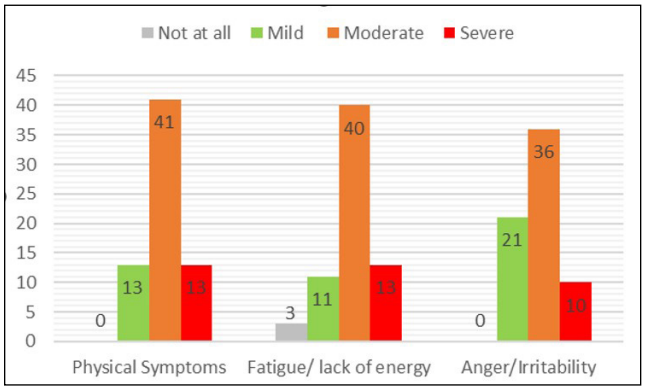


Figure 1. Most severe symptoms of PMS.

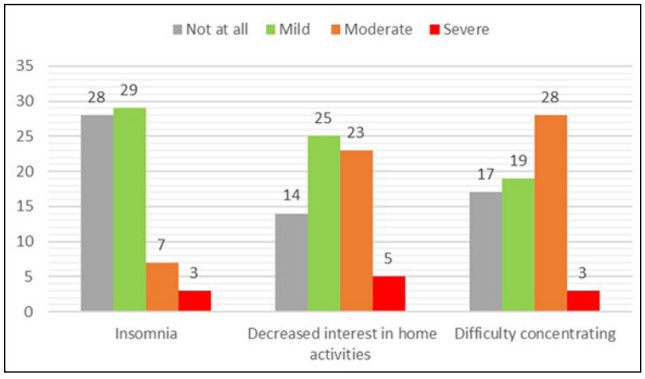


Figure 2. Least severe symptoms of PMS.

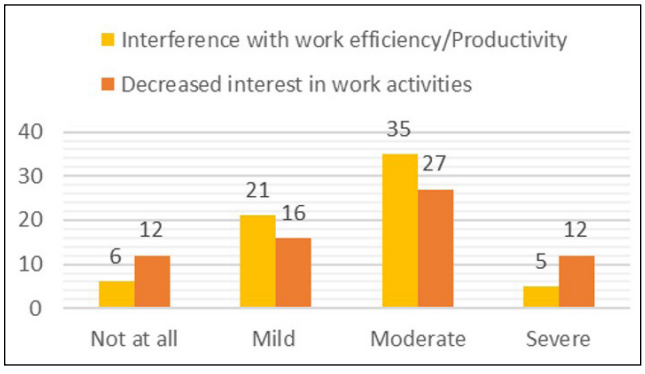


Figure 3. Impact on work and productivity (home and office).

These findings suggest that sleep disturbances, loss of interest in domestic activities, and concentration problems are not as prominent or impactful as some of the other symptoms reported in the study.

3.2 Impact on Daily Life

The data reveals significant impacts on various aspects of daily life. In terms of work and productivity, a considerable number of individuals experience moderate to severe interference with their 'work efficiency and productivity', with 35 reporting moderate effects and 5 reporting severe effects. Additionally, there's a notable 'decrease in interest in work activities', with 27 women experiencing moderate effects and 12 experiencing severe effects (Figure 3).

Social and family relationships are also affected. 'Relationships with coworkers' show moderate impacts for 27 individuals and severe impacts for 3. 'Relationship with family' is moderately affected for 22 individuals and severely affected for 7. 'Social activities' see moderate impacts for 24 women and severe impacts for 3 (Figure 4).

Home life is not spared from these effects either. 'Home responsibilities' are moderately impacted for 20 individuals and severely impacted for 3. There's also a 'Decreased interest in home activities', with 23 individuals reporting moderate effects and 5 reporting severe effects (Figure 5).

These findings suggest that the symptoms have wide-ranging consequences, affecting professional, social, and personal domains of life.

3.3 Emotional and Mental Health

The data on emotional and mental health symptoms reveals significant impacts on mood and sleep patterns. Among mood-related symptoms, 'anxiety and tension' are particularly prominent, with 34 women reporting moderate levels and 6 experiencing severe symptoms. 'Depressed mood and feelings of hopelessness' also affect a considerable number of women, with 25 reporting moderate symptoms and 8 experiencing severe manifestations. Additionally, 20 women report feeling moderately over whelmed or out of control, while 8 describe these feelings as severe (Figure 6).

Regarding sleep disturbances, 'hypersomnia (excessive sleepiness)' appears to be a more significant issue than 'insomnia'. 27 people report moderate levels of hypersomnia, with 7 experiencing severe symptoms. In

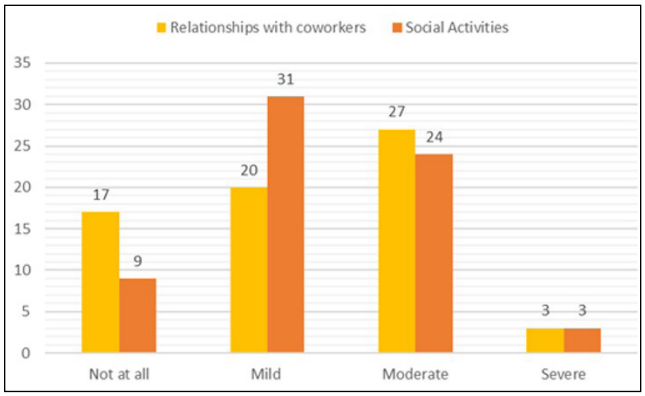


Figure 4. Impact on social and family relationships.

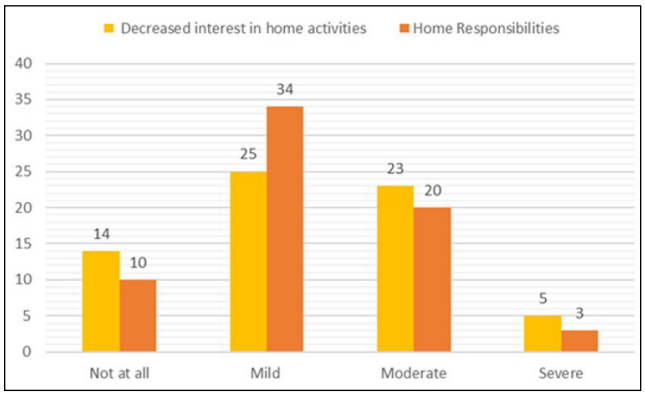


Figure 5. Impact on home activities and responsibilities.

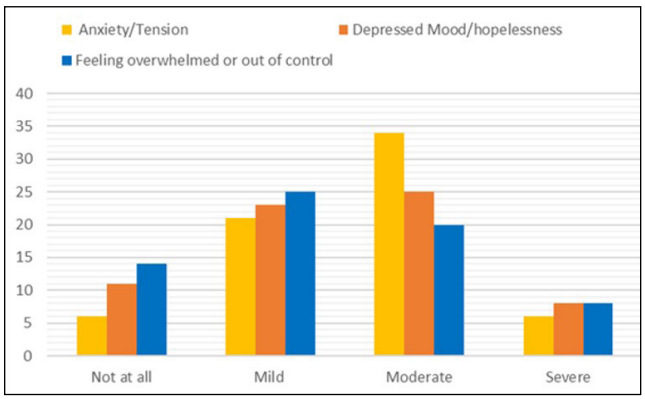


Figure 6. Impact on emotional and mental health.

contrast, insomnia is less severe than other symptoms in the dataset (Figure 7).

This pattern suggests that excessive sleepiness may be a more common problem than difficulty falling or staying asleep for women suffering from premenstrual syndrome.

The findings of this study provide valuable insights into the prevalence and severity of premenstrual symptoms among urban working Indian women. The

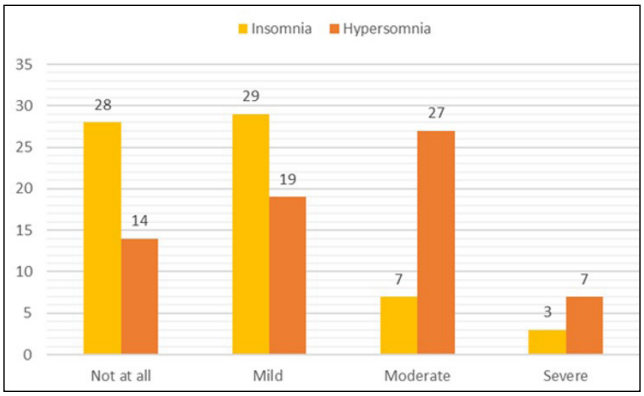


Figure 7. Insomnia *vs* Hypersomnia.

results highlight several key areas of concern and align with previous research on Premenstrual Syndrome (PMS) in various populations. The high prevalence of moderate to severe physical symptoms, including breast tenderness, headaches, joint or muscle pain, bloating, and weight gain, is consistent with previous studies on PMS conducted by Direkvand-Moghadam *et al*[13]. Research conducted by Raval *et al.* in 2016 examining urban women in India revealed comparable frequencies of moderate to severe premenstrual manifestations, with a particular emphasis on bodily discomfort and emotional fluctuations. Their investigation indicated that nearly two-thirds of the women surveyed reported considerable physical distress, aligning with our observations regarding the widespread occurrence of moderate to severe corporeal symptoms.

Similarly, the prominence of fatigue and lack of energy in our study aligns with findings from Dennerstein *et al.*,[14] who reported fatigue as a significant symptom in their cross-cultural study of premenstrual experiences. A study conducted by Mishra *et al.*, in 2018 focused on employed women in India's capital city. Their research revealed that exhaustion and emotional volatility were frequently cited complaints among participants, which aligns with our findings. Furthermore, their study highlighted substantial effects on job performance and interpersonal interactions, corroborating our observations regarding how premenstrual syndrome interferes with various aspects of daily living.

The high prevalence of anger or irritability in our study population is noteworthy. This finding is supported by research from Matsumoto *et al.*,[15] who found irritability to be a key symptom in their study of Japanese women with PMS. In a study from the developing South Asian nation of Pakistan, Nisar *et al.*, reported that emotional symptoms,

particularly anger and irritability, were prominent among urban working women[16]. This aligns with our findings and hints at a potential regional pattern in symptom patterns. The impact of these emotional symptoms on work efficiency and relationships, as observed in our study, underscores the potential socioeconomic consequences of PMS, a concern also raised by Halbreich *et al*.,[17] in their review of the burden of premenstrual dysphoric disorder.

Our findings regarding the interference of PMS symptoms with work productivity, social activities, and relationships are particularly relevant in the context of urban working women. These results echo the conclusions of Dean *et al*.,[18] who reported significant impairment in work productivity and interpersonal relationships among women with PMS.

The prevalence of hypersomnia over insomnia in our study population presents an interesting contrast to some previous research. While Baker and Driver's review highlighted both insomnia and hypersomnia as common sleep disturbances in PMS[19], our findings suggest that excessive sleepiness may be a more prominent issue for urban Indian women. A study by Chaturvedi *et al*., on sleep disturbances in Indian women with PMS, also found excessive daytime sleepiness to be more common than insomnia, suggesting this may be a characteristic pattern in the Indian population[20]. This discrepancy warrants further investigation and may reflect cultural or lifestyle factors specific to our study population.

The high prevalence of PMS symptoms in our sample of urban Indian women aligns with global trends but may also reflect specific cultural and societal factors. Sharma and Sharma's review of women's health issues in India highlighted the need for greater awareness and management of menstrual health concerns in the context of changing urban lifestyles[21].

3.4 Limitations and Future Directions

While our study provides valuable insights, it is limited by its relatively small sample size and cross-sectional design. Future research should consider longitudinal studies to better understand the cyclical nature of PMS symptoms and their long-term impact on women's health and well-being. Additionally, exploring the influence of dietary habits, stress levels, and physical activity on symptom severity could provide a more comprehensive understanding of PMS in this population. Evaluating tailored interventions, such as stress management techniques and exercise programs, could provide valuable insights for symptom management. Additionally, developing culturally appropriate screening tools would enhance diagnosis and treatment strategies for PMS in this population.

4. Conclusion

This study highlights the significant prevalence of moderate to severe premenstrual symptoms among urban working Indian women, with notable impacts on physical health, emotional well-being, and daily functioning. To mitigate the effects of PMS on urban working Indian women, a multi-faceted approach is recommended. This includes implementing workplace wellness initiatives with PMS education and flexible working hours, enhancing healthcare provider training, launching public awareness campaigns, and integrating PMS management into primary care. These strategies would help foster a more supportive and understanding environment in both professional and personal spheres for urban Indian Women suffering from PMS.

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