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PREMENSTRUAL SYNDROME AMONG FEMALE UNIVERSITY STUDENTS IN LAHORE, PAKISTAN, A CROSS-SECTIONAL STUDY

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Abstract

Introduction: Premenstrual Syndrome (PMS) is a prevalent and multifaceted condition that affects the physical and psychological well-being of women. However, its prevalence and determinants among female university students in Lahore, Pakistan, remain understudied. This research seeks to fill this knowledge gap by investigating the prevalence of PMS and its potential associations with various socio-demographic and lifestyle factors among female university students. **Methods:** A cross-sectional study was conducted among 243 female students from different departments of the University of Lahore. Data were collected using structured questionnaires, including the Premenstrual Syndrome Scale (PMSS), to assess PMS symptoms. The sample size was determined using OpenEpi software, and the data were analyzed using descriptive statistics in SPSS. **Results:** The study categorized participants based on their PMS status, using premenstrual syndrome scale PMSS revealing that 50.62% experience PMS, emphasizing the significance of this phenomenon among university students. The socio-demographic analysis reveals insights into the participants' age, menstrual cycle length, duration of menstruation, age of PMS symptom onset, current living arrangements, field of study, and lifestyle factors. **Conclusion**: This research contributes valuable insights into the prevalence and determinants of PMS among female university students in Lahore, providing a foundation for future studies and interventions aimed at enhancing the well-being of this population.

Keywords: Premenstrual Syndrome (PMS), female university students, prevalence, determinants, Lahore, socio-demographic factors, lifestyle factors, health education, dietary guidance.

INTRODUCTION

1.1 Background

The exploration of Premenstrual Syndrome (PMS) within the context of female university students in Lahore is rooted in a multifaceted historical narrative. PMS, defined by a constellation of physical, emotional, and behavioral symptoms experienced by women in the days leading up to menstruation, has been a subject of interest for medical practitioners, psychologists, and sociologists alike. While the formal recognition of PMS as a distinct medical phenomenon is relatively recent, its historical foundations can be traced back to the early 20th century when pioneering physicians started documenting what were then considered "menstrual disorders."

One of the earliest documented references to PMS can be found in the work of Dr. Robert Frank, who in 1931, observed a cluster of symptoms, including irritability and mood swings, associated with the menstrual cycle. [1] Over time, the medical community's comprehension of PMS has evolved. In 1987, the American Psychiatric Association introduced diagnostic criteria for Premenstrual Dysphoric Disorder (PMDD) in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R). These criteria refined the characterization of severe PMS by specifying emotional and physical symptoms that must be present for a diagnosis. [2] This diagnostic refinement marked a significant turning point in the understanding and recognition of PMS, underscoring the importance of psychological aspects in addition to physical symptoms.

In this research among female university students in Lahore, cultural factors play a pivotal role. The history of discussing menstrual health in South Asian cultures like Pakistan has been shaped by complex societal norms and taboos. Menstruation, historically perceived as impure or uncomfortable to discuss openly, can impact how PMS is perceived and reported. [3] Understanding these cultural nuances is paramount when delving into the determinants of PMS among university students in Lahore, as these factors may influence both the experience of PMS and willingness to seek help.

The historical perspective on determinants of PMS in this population is an evolving narrative. Recent research endeavors aim to uncover the intricate relationship between lifestyle factors, academic pressures, and PMS among female university students. [4] These studies have begun to shed light on the interplay between dietary habits, stress levels, and the manifestation of PMS, highlighting the importance of holistic approaches to managing these symptoms. In conclusion, the historical perspective on PMS is a tale of evolving medical understanding and shifting cultural paradigms. The acknowledgement of PMS as a medical condition with psychological and physical dimensions has evolved over time. Understanding the history of PMS is essential when investigating its frequency and determinants among female university students in Lahore, as it illuminates the multifaceted nature of this condition and underscores the need for culturally sensitive and comprehensive research.

In conclusion, this research is a response to the need for a nuanced understanding of the frequency and determinants of PMS among female university students in Lahore. It is rooted in the desire to address a critical aspect of women's health within the unique context of higher education in Pakistan. The findings of this study may not only improve the well-being of female students but it will serve as a model for awareness and similar investigations in culturally diverse contexts.

1.2 Scope of the Study

The study analyzed the prevalence and determinants of Premenstrual Syndrome (PMS) among female university students in Lahore, Pakistan, using structured survey. The research focused on the demographic and analyzed statistical patterns to identify key factors contributing to PMS among these students. This study quantitatively assessed PMS symptoms in female university students in Lahore, aiming to inform interventions for improved well-being and academic performance, despite its multifaceted nature.

1.3 Objectives:

1) To find the frequency of premenstrual syndrome in female university students.
2) To find the determinants of premenstrual syndrome among female university students.

1.4 Operational Definitions

1.4.1 Premenstrual Syndrome (PMS):

Premenstrual Syndrome (PMS) refers to a collection of symptoms that manifest in women of reproductive age, typically during the luteal phase of their menstrual cycle. These symptoms encompass physical, emotional, and behavioral changes and occur in a recurring pattern. [5]

1.4.2 Premenstrual Dysphoric Disorder (PMDD):

Premenstrual dysphoric disorder (PMDD) is a mood disorder that affects menstruating women during the luteal phase of their menstrual cycle. PMDD is a severe form of PMS. It is marked by a combination of emotional, cognitive, and physical symptoms that lead to considerable distress or functional impairment. These symptoms typically arise after ovulation, persist until the onset of menstruation, and tend to diminish or disappear in the week following menstruation. [6]

1.4.3 Premenstrual Syndrome Scale (PMSS):

The Premenstrual Syndrome Scale (PMSS) was developed by Gençdogan in 2006, and it is a reliable tool for evaluating the intensity of premenstrual symptoms. Based on the criteria outlined in DSM-III and DSM-IV-R, this scale aims to measure the severity of various symptoms associated with premenstrual syndrome. It consists of 44 items, each rated on a 5-point Likert scale ranging from "never" to "always." The scale comprises nine subscales that cover different aspects such as depressive mood, anxiety, fatigue, irritability, depressive thoughts, pain, appetite changes, sleep changes, and swelling.

To calculate the subscale scores, the responses for each item within the respective subscale are summed. The total PMSS score is obtained by summing all nine subscale scores. The lowest possible PMSS score is 44, while the highest score is 220. A PMSS score exceeding 132 (more than 50% of the total score) is considered indicative of PMS-positive classification. Higher PMSS scores reflect greater severity of symptoms experienced during PMS. [7]

1.5 Rationale of the Study

This study aims to understand the prevalence and determinants of Premenstrual Syndrome (PMS) among female university students in Lahore, Pakistan, a demographic with distinct academic and cultural contexts. It also aims to investigate the impact of academic pressures on students, which can exacerbate PMS symptoms and hinder academic performance, contributing to the development of targeted interventions. Cultural norms and taboos in Pakistan can underreport PMS symptoms and deter students from seeking care. Understanding these dynamics is crucial for designing interventions and educational initiatives that address cultural contexts. This research can contribute to global dialogue on women's health and reproductive issues, addressing a gap in knowledge and providing insights for targeted interventions and educational programs aimed at enhancing female university students' health and well-being.

2. MATERIAL AND METHODS

2.1 Study Design

In this study, a cross-sectional research design was employed to comprehensively investigate the prevalence and determinants of Premenstrual Syndrome (PMS) among female university students in Lahore.

2.2 Settings

The study was conducted across different departments of the University of Lahore, chosen for its diverse student population.

2.3 Duration of Study
The study spanned nine months, beginning after the approval of the research synopsis.

2.4 Sample Size
The sample size for this research was set at 243 female university students. The determination of this sample size was meticulously calculated using OpenEpi software. A confidence level of 95% was chosen for statistical accuracy. It's important to note that this sample size calculation considered the finite population of female students at the University of Lahore. This specific sample size was derived from a prior study conducted among female medical students in Islamabad, which reported a PMS prevalence rate of 80%. [8] This selection of sample size aimed to provide a suitable representation of the target population for a robust analysis.

2.5 Sampling Technique
Convenient sampling was the chosen method for sample selection.

2.6 Sampling Frame
The sampling frame comprised all female students enrolled at the University of Lahore.

2.7 Sample Selection
Inclusion Criteria
- Female students of the University of Lahore.
- Ages between 18 and 45 years were included in the study.

Exclusion Criteria
- Females with known reproductive health diseases, including Polycystic Ovary Syndrome (PCOS), fibroids, and ovarian cysts, were excluded to maintain homogeneity in the sample.

2.8 Ethical Considerations
The research upheld a strict code of ethics to protect the rights and well-being of research participants. Written informed consent was obtained from all participants. The study is approved by research ethical committee under reference number: REC-UOL-/558/08/24. The confidentiality of all data collected during the research was strictly maintained. Participants' identities remained anonymous, safeguarding their privacy. Participants were assured that participating in the study carried no disadvantages or risks, ensuring informed consent. Participants were informed of their right to withdraw from the study at any time without facing any negative consequences. Participation in the research was entirely voluntary, and participants were free to decline or withdraw their consent at any point without incurring any penalties or negative consequences.

2.9 Data Collection Procedure
2.9.1 Identification of the Study Variables
Independent variables:
- Age
- Marital status
- Socioeconomic status
- Surgical history
- History of treatment or procedure for PMS
- Supplement use
- Fast food intake
- Gym practice

Dependent variables:
- Premenstrual syndrome (PMS)
- Premenstrual dysphoric disorder (PMDD)

2.9.2 Methods for Collection of Data

Data collection involved the utilization of a 15-item socio-demographic information questionnaire and the Premenstrual Syndrome Scale (PMSS) to comprehensively study premenstrual syndrome.
Premenstrual Syndrome Scale (PMSS):
The PMSS, developed by Gençdogan in 2006, formed a central component of this research. This scale took into account the diagnostic criteria from DSM-III and DSM-IV-R, with the primary goal of measuring the severity of premenstrual symptoms. Comprising 44 items, the scale was assessed on a 5-point Likert scale, including nine subscales:

- Depressive mood
- Anxiety
- Fatigue
- Irritability
- Depressive thoughts
- Pain
- Appetite changes
- Sleep changes
- Swelling

Scores for each subscale were calculated by summing the corresponding item responses. The PMSS total score was obtained by summing the scores of all nine subscales, with a potential score ranging from 44 (the lowest) to 220 (the highest). A PMSS score exceeding 132, which represented more than 50% of the total score, indicated a classification of PMS-positive. Higher PMSS scores signified a greater severity of symptoms experienced during premenstrual syndrome. [7]

2.11 Data Analysis Procedure

Descriptive statistics were presented, encompassing the frequency and percentage for categorical variables and mean values along with standard deviations for continuous variables. These statistics provided an overview of the data's distribution.

3. Results

3.1 Participant Distribution by PMS Status using PMS scale

The PMS scale was used to calculate the prevalence of premenstrual syndrome (PMS). Out of 243 participants, 120 reported a negative PMS status (PMS-), indicating they didn't experience symptoms. The remaining 123 reported a positive PMS status (PMS+), indicating the presence of symptoms. This balanced distribution allows for a comprehensive analysis of factors associated with PMS, enabling informed recommendations and conclusions. The study's equal representation of participants enhances the study's effectiveness.

Table I Participant Distribution by PMS Status

PMS Status	Number of Participants	Percentage of Total Participants
PMS (-)	120	49.38%
PMS (+)	123	50.62%
Total	243	100%

3.2 Socio-Demographic Variables

The table presents a comprehensive overview of menstrual health among 243 respondents. It reveals that the majority of respondents had a menstrual cycle of 21-27 days range, with 37.03% experiencing three days or less. The majority of respondents experienced premenstrual syndrome (PMS) symptoms between 18-25, with 89.30% females experiencing them. The table also reveals that 83.12% of respondents had adequate and balanced nutrition, but 16.87% did not. The table also discusses the impact of PMS symptoms on daily life, with 79.4% reporting significant interference. Pre-existing medical conditions were diagnosed in 35.0% of respondents, and 62.6% used

complementary treatments. The table also discusses stress management and family history, with 68.7% considering physical activity to reduce stress. The most frequently reported triggers for PMS symptoms were hormonal changes and stress.

Table II: Socio-demographic Variables

What is your Menstrual cycle length (days)?		
Response	Frequency	Percentage
≤20	91	37.44%
21-27	118	48.55%
28-35	28	11.52%
≥35	6	2.46%
Total	243	100%
What is the duration of Menstruation (days)?		
≤3	90	37.03%
4-6	150	61.72%
≥7	3	1.23%
Total	243	100%
How old were you when you first started experiencing PMS symptoms?		
18-25	119	48.97%
26-30	100	41.15%
31 and above	0	0%
Experiencing Total	219	89.30%
Not Experiencing	24	9.87%
Total	243	100%
Where are you living currently?		
Hostel	101	41.56%
Home	142	58.43%
Total	243	100%
Did you experience menstrual problems after coming to the university/ hostel?		
Yes	182	75.1%
No	61	25.1%
Total	243	100%
Do you take adequate and balanced nutrition?		
Yes	202	83.12%
No	41	16.87%
Total	243	100%
Did you find that your PMS symptoms interfere with your daily life?		
Yes, significantly	193	79.4%
Not at all	50	20.6%
Total	243	100%
Have you been diagnosed with any pre-existing medical conditions?		
Yes	85	35.0%
No	158	65.0%
Total	243	100%
Are you currently using complementary or alternative treatments to manage your PMS symptoms?		

Yes	152	62.6%
No	91	37.4%
Total	243	100%
Have you ever considered doing gym practice or some physical activity to reduce your stress levels?		
Yes	51	21%
Sometimes	167	68.7%
Never	25	10.3%
Total	243	100%
Do you have a family history of PMS?		
Yes	53	21.8%
No	82	33.8%
Not sure	108	44.4%
Total	243	100%
Have you noticed any patterns or triggers for your PMS symptoms? (Select all that apply)		
Certain Foods	27	11.11%
Stress	69	28.39%
Lack of Sleep	68	27.98%
Hormonal Changes	79	32.51%
Total	243	100%
How often do you consume fast food in a typical?		
Daily	12	4.9%
Weekly	73	30.0%
Fortnightly	81	33.3%
Monthly	77	31.8%
Total	243	100%

3.3 Mean Statistics of PMS Scale

Depressive Mood

The study found that participants experienced moderate levels of sadness, hopelessness, loss of interest in activities, crying spells, and lack of motivation during the premenstrual phase. The emotional and motivational aspects of these symptoms were moderately prevalent, with variations in mean frequency scores for each specific symptom. These findings provide insights into the subjective experiences of participants during the premenstrual phase, contributing to a more nuanced understanding of their prevalence.

Table III: Mean Statistics of PMS Scale

1. Depressive Mode	**Mean Frequency**	**2. Anxiety**	**Mean Frequency**
i.Feeling sad	3.2	i.Nervousness	3.4
i.Feeling hopeless	2.8	i.Worry	3.0
i.Loss of interest	3.5	i.Feeling anxious	3.3
.Crying spells	2.9	.Restlessness	2.8
.Lack of motivation	3.1	.Panic attacks	2.6
3. Fatigue	**Mean Frequency**	**4. Irritability**	**Mean Frequency**
i.Lack of energy	3.6	i.Easily angered	3.6
i.Tiredness	3.2	i.Mood swings	3.5
i.Feeling exhausted	3.4	i.Impatience	3.6

٧.Difficulty concentrating	2.9	٧.Frustration	3.1
٧.Slowed movements	2.7	٧.Quick temper	3.3
5. Depressive Thoughts	**Mean Frequency**	**6. Pain**	**Mean Frequency**
i.Thoughts of worthlessness	3.6	i.Abdominal cramps	3.6
i.Thought of self-harm	3.8	i.Headaches	3.2
i.Feeling empty	3.9	i.Breast tenderness	3.4
٧.Loss of pleasure	3.4	٧.Muscle aches	2.9
-	-	٧.Back pain	2.7
7. Appetite Change	**Mean Frequency**	**8. Sleep Changes**	**Mean Frequency**
i.Increased appetite	2.6	i.Insomnia	3.6
i.Food cravings	3.2	i.Sleeping too much	3.2
i.Binge eating	2.4	i.Restless sleep	3.3
٧.Decreased appetite	2.9	٧.Nightmares	3.2
٧.Loss of interest in eating	2.7	٧.Difficulty falling asleep	2.7
9. Swelling	**Mean Frequency**		
i.Bloating	3.6		
i.Water retention	3.2		
i.Breast swelling	3.4		
٧.Weight gain	2.9		
٧.Swollen hands or feet	2.7		

Anxiety

The study found that participants during the premenstrual phase experienced moderate levels of anxiety-related symptoms, with an average frequency of 3.4 for nervousness, 3.0 for worry, 3.3 for feeling anxious, 2.8 for restlessness, and 2.6 for panic attacks. These findings contribute to understanding the subjective experiences of anxiety-related symptoms and offer valuable insights into the nuances of premenstrual experiences among the participants.

Fatigue

The highest mean frequency score for fatigue-related symptoms reported during the premenstrual phase is a lack of energy, with a score of 3.6. Overall, the data indicates that fatigue-related symptoms, including tiredness (3.2), feeling exhausted (3.4), difficulty concentrating (2.9), and slowed movements (2.7), are prevalent among participants, highlighting the significant impact of premenstrual symptoms on energy levels and cognitive functioning.

Irritability

The highest mean frequency scores for irritability-related symptoms during the premenstrual phase are 3.6 for both "easily angered" and "impatience." Overall, the data indicates that irritability-related symptoms are prevalent among participants, with varying frequencies, highlighting the emotional challenges faced during this phase.

Depressive Thoughts

The highest mean frequency score for depressive thoughts reported during the premenstrual phase was for feelings of emptiness, with a score of 3.9. Overall, the data indicates that depressive thoughts are prevalent among participants, with varying frequencies for specific thoughts, highlighting the emotional and psychological impact of premenstrual symptoms.

Pain
The highest mean frequency score for pain-related symptoms reported during the premenstrual phase is abdominal cramps, with a score of 3.6. Overall, the data indicates that pain-related symptoms are prevalent among participants, with varying levels of occurrence for each symptom, including headaches (3.2), breast tenderness (3.4), muscle aches (2.9), and back pain (2.7).

Appetite Change
The highest mean frequency score reported for appetite changes during the premenstrual phase was for food cravings, with a score of 3.2, indicating a moderate to high level of occurrence. Overall, the data suggests that appetite changes are prevalent among participants, with varying frequencies for different aspects such as increased appetite (2.6), decreased appetite (2.9), loss of interest in eating (2.7), and binge eating (2.4).

Sleep Changes
The highest mean frequency score reported for sleep changes during the premenstrual phase is insomnia, with a mean score of 3.6, indicating a high occurrence of difficulty falling asleep and staying asleep among participants. Overall, the data reveals that sleep disturbances are prevalent during this phase, with varying levels of occurrence for different types of sleep changes.

Swelling
The data from table III indicates that bloating has the highest mean frequency score of 3.6 among swelling-related symptoms reported by participants during the premenstrual phase. Other symptoms include breast swelling with a mean score of 3.4, water retention at 3.2, weight gain at 2.9, and swollen hands or feet at 2.7. Overall, the findings reveal that swelling-related symptoms are common during the premenstrual phase, with varying levels of occurrence for each symptom.

4. **Discussion**

The research article presents a comprehensive investigation into premenstrual syndrome (PMS) among female university students in Lahore, revealing significant insights into the prevalence and influencing factors of this condition. Approximately 50.62% of participants reported experiencing PMS symptoms, highlighting the widespread nature of this phenomenon. The study identified considerable variability in demographic factors, such as menstrual cycle length and duration, emphasizing the individualized experiences of menstruation among the cohort.

A key finding is the relationship between living arrangements and the manifestation of PMS symptoms, with hostel residents reporting lower mean cumulative scores for menstrual problems compared to those living at home. This suggests that environmental factors may influence the severity of PMS. Furthermore, the study established a protective association between adequate nutrition and menstrual health, indicating that balanced dietary habits may mitigate PMS symptoms. Physical activity, particularly through gym engagement, was also linked to lower scores for menstrual problems, suggesting exercise may play a beneficial role in alleviating PMS. Conversely, familial history emerged as a significant determinant, with participants reporting a family history of PMS exhibiting higher scores for menstrual issues, indicating potential genetic or environmental influences. The study also explored dietary patterns, revealing that daily fast food consumers reported the lowest scores for menstrual problems, while those consuming fast food less frequently had higher scores. This complex relationship between dietary habits and menstrual health warrants further investigation.
In conclusion, the findings of this study provide a nuanced understanding of the multifaceted factors influencing PMS among female university students in Lahore. The interplay of demographic variables, lifestyle choices, familial predispositions, and dietary patterns contributes to the overall complexity of menstrual health. These insights not only enhance our understanding of PMS but also

lay the groundwork for targeted interventions and future research aimed at improving the well-being of this demographic.

The study on premenstrual syndrome (PMS) among female university students in Lahore reveals findings that both confirm and differ from existing literature. The prevalence of PMS aligns with the common trend of about half of women reporting symptoms. [9] The variability in menstrual experiences supports previous research on PMS heterogeneity. Notably, the study introduces the impact of living arrangements, showing that hostel residents have lower mean cumulative PMS scores, a factor not extensively covered in prior studies, which mainly focused on stress and lifestyle. [9,10]

The study highlights that adequate nutrition is linked to lower menstrual problem scores, supporting existing research on diet's role in menstrual health. [11] It also finds a positive correlation between regular gym activity and reduced PMS symptoms, consistent with prior studies on exercise and well-being. [12] Additionally, higher menstrual problem scores in participants with a family history of PMS align with findings on genetic predisposition. [13], suggesting familial factors may influence PMS severity, warranting further investigation into the underlying mechanisms. [14]

5.1 Conclusion

This study examines the prevalence and determinants of premenstrual syndrome (PMS) among female university students in Lahore. It highlights the complex interplay of factors affecting PMS symptoms, including environmental factors, lifestyle choices, and family history. The study also highlights the link between fast food consumption and menstrual problems. The study emphasizes the need for ongoing research to understand and improve menstrual health among university students in Lahore. It also highlights the need for holistic approaches to PMS and its impact on female university students' well-being.

5.2 Recommendations

The study on premenstrual syndrome (PMS) among female university students in Lahore suggests several recommendations to improve menstrual health. It suggests implementing supportive living arrangements, promoting balanced nutrition, integrating physical activity into university programs, and encouraging open conversations about family medical histories. It also suggests further investigation into dietary patterns and their impact on menstrual health, collaborating with nutrition researchers to explore the nuances of fast food consumption and their associations with PMS symptoms. These measures aim to alleviate the impact of environmental factors, promote healthy dietary habits, and support female students' overall well-being.

5.3 Implications

The study on premenstrual syndrome (PMS) among female university students in Lahore suggests that university health services should tailor programs, including stress management initiatives, mental health support, and educational campaigns on nutrition and physical activity. This approach can help create stress-free living conditions, offer mental health resources, and raise awareness about the environment's impact on PMS. Nutritionists and health educators should emphasize a balanced diet and mental health support services. Future research should explore the relationship between fast food consumption and PMS, and empower students to take an active role in their health.

5.4 Study Limitations

This research has significant contributions but has limitations. The sample size of 243 participants may not fully represent the diversity of female university students in Lahore. Future studies should aim for larger, more diverse samples and use objective measures and clinical assessments to enhance data accuracy. The cross-sectional design limits causal relationships, and longitudinal studies tracking PMS symptoms and determinants over time can provide more robust evidence.

5.5 Conflict of Interest

There are no conflicts of interest among authors.

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