

Cross-Sectional Correlational Study on Prevalence of Premenstrual Syndrome and Emotional Regulation Among Female Medical Students

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Abstract

Premenstrual syndrome (PMS) is a common problem that affects many women during their luteal phase of menstrual cycle. The practice of managing and controlling one's emotions in order to accomplish goals, adapt to various circumstances, and uphold strong relationships with others is known as emotional regulation. Many women report suffering emotional symptoms including mood swings, anxiety, and angry outbursts during the luteal phase of their menstrual cycle. PMS has been linked to emotional control. The objective of the current study is to assess the prevalence of Premenstrual Syndrome and its correlation with Emotion regulation of Female Medical Students. 220 female medical students in the 18–28 age range participated in a cross-sectional and correlation research. The method of purposive sampling was applied. The results indicate an 82.3% prevalence of PMS, with 2.7% reporting extremely severe symptoms, followed by 24.7% severe and 51% moderate symptoms. Finding shows, Participants in the research had a high frequency of PMS symptoms, including typical behavioural, physical, and psychological symptoms. The majority of individuals showed average emotional control, according to the study, and cognitive reappraisal and expressive suppression were positively correlated. Emotional control was

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positively correlated with age, and several aspects of PMS were positively correlated with one another.

Key Words: *Emotional Regulation, Menstrual cycle, Premenstrual Syndrome, Prevalence*

Introduction

Schneider et al. (2015) defined Epidemiology as "The study of the occurrence and distribution of health-related events, states, and processes in specified populations, including the study of the determinants influencing such processes, and the application of this knowledge to control relevant health problems." (Adapted from Lilienfeld, 1980)

According to World Health Organization (WHO) Epidemiology is "The study of the distribution and determinants of health-related states or events (including disease), and the application of this study to the control of diseases and other health problems. Various methods can be used to carry out epidemiological investigations: surveillance and descriptive studies can be used to study distribution; analytical studies are used to study determinants. " (Mathilde Frerot, 2018)

Premenstrual Syndrome

Menstruation is a normal part of every woman's life and is essential for the renewal of the uterine lining in preparation for pregnancy. Premenstrual Syndrome (PMS) is a common health condition in women in reproductive age. In medical definition, PMS is a collection of symptoms that includes emotional and physical aspects, mostly appearing in the luteal stage of every menstruation cycle which are too intense hindering routine aspects of life (Lori M. Dickerson, 2003).

In menstruating females, the luteal phase refers to the period between ovulation and the onset of menses, whereas the follicular phase begins with the onset of menstruation (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition [DSM-IV]).

Diagnostic and statistical Manual of Mental Disorders (DSM) defines PMDD as a severe form of PMS defined mainly by its psychiatric symptoms, according to the (Jerald Kay, 2006).

American college of Obstetricians and Gynaecologists (ACOG) defined PMS as “Symptoms must be present in five days before a woman’s period for regular three menstrual cycles and must end within four days after the start of the period. Pre-menstrual syndrome (PMS) occurs 7-14 days before the onset of menstruation and subsides with the commencement of menstrual flow. It affects women during their reproductive age, and is associated with physical, psychological and behavioural changes”

Some of the common symptoms of PMS include: depression, breast swollen and tenderness, irritability, edema of ankles and fingers, mood swings, tension, appetite changes, headache, generalized pains, pain in muscles, abdominal bloating, reduction in energy, and abdominal cramps.

Epidemiology of Premenstrual Syndrome

As per the finding of WHO, females are much more likely to experience loss of confidence, low self-esteem and sadness and less energy as compared to males. Further, the age group of 15-29 makes up 27.7% i.e. one-fourth of the total female population in India. The above demographic is the transition phase of life which is associated with spurt of physical, mental, emotional, and social development.

The Diagnostic Feature for PMS/PMDD are clearly outlined in the DSM-5 which provides an updated framework over the DSM-IV for PMDD and the DSM-III- TR criteria for Late Luteal Phase Dysphoric Disorder. These previous classifications were included in the appendix and categorised as Depressive Disorder Not.

To meet the diagnostic criteria for PMDD, Criterion A specifies that, during most menstrual cycles in the preceding year, at least five out of eleven possible symptoms must be present in the premenstrual week before the onset of menses. These symptoms should begin to improve within a few days after

menstruation starts and should become minimal or absent in the week following menses.

Criterion B outlines that there should be at least one of the 5 symptoms given below which are

- (1) marked affective lability,
- (2) marked irritability or anger,
- (3) marked depressed mood, or
- (4) marked anxiety or tension.

Criterion C specifies that in addition to the above mentioned 5 core symptoms, it may also include reduced interest in usual activities, difficulty in concentration, lethargy or low energy, change in appetite or specific food cravings, sleep cycle changes, feeling a sense of being overwhelmed or out of control, and physical symptoms such as abdominal bloating, weight gain, joint or muscle pain, or breast tenderness or swelling.

Criterion D requires that these symptoms must cause clinically significant distress or interfere with social, occupational, or other important areas of functioning.

Criterion E further clarifies that the symptoms should not simply represent a worsening of another psychiatric disorder, although they may coexist with other conditions..

Criterion F requires confirmation of the timing of symptoms described in Criterion A through prospective daily ratings over at least two symptomatic cycles.

Finally, Criterion G states that the symptoms must not be attributable to the physiological effects of a substance, medication, or another medical condition (American Psychiatric Association, 2013).

Emotional Regulation

“Emotional regulation refers to the process by which individuals influence which emotions they have, when they have them, and how they experience and express their feelings. Emotional regulation can be automatic or controlled, conscious or unconscious, and may have effects at one or more points in the emotion producing process” (Gross, 1998). The process model of emotion regulation, proposed by James J. Gross (1998), outlines five key strategies that individuals can employ at different stages of the emotion-generation process. These strategies include:

- (1) Situation Selection,
- (2) Situation Modification,
- (3) Attention Allocation,
- (4) Cognitive Reappraisal, and
- (5) Expression Suppression.

Among these above mentioned strategies, cognitive reappraisal and expression suppression are arguably the most commonly used and effective. Thus, these two strategies were selected for use in the present study.

A cross-sectional descriptive study conducted by Mandal et al., (2015) in which data from 278 students was collected using a pre-tested, pre-designed, self-administered questionnaire in a classroom setting. The findings indicated that 54% of the participants reported PMS symptoms. With respect to affective symptoms as defined under the American College of Obstetricians and Gynecologists criteria, depression was reported by 45.7% of participants, anger by 61.2%, irritability by 88.1%, anxiety by 51.8%, confusion by 46.4%, and feelings of rejection by 24.8%. Additionally, physical symptoms included breast pain (22.7%), abdominal distension (37.5%), headache (40.6%), and swelling of limbs (5%).

Badkur et al., (2018) selected 4 colleges using convenience sampling and conducted observational follow-up study at these colleges which are located in Ujjain city. Around 250 girls from ages 18-25 years participated in the study in which PMS and menstrual profile related data of these girls was collected using a modified version of daily record of severity of problems for at least 2 consecutive menstrual cycles. Finally, the ACOG criteria was used for diagnosis of PMS. The results indicated that the prevalence of PMS was 39.6%, and it was found to have a negative association with a maternal history of menstrual problems.

In 2016, a study was published in the *Journal of Obstetrics and Gynaecology Research* which examined the relationship between income level and PMS in a sample of 269 Iranian women. The study found that women from lower income households reported significantly more severe PMS symptoms than those from higher income households. The researchers suggested that the stress associated with financial hardship may exacerbate PMS symptoms (Kashanian, 2016).

Women are important segment of society they play important and powerful role in family as well as society. PMS is a common condition among younger women and can adversely affected their emotional well-being as well as their education. So, this study will try to investigate the prevalence of PMS among female students and how PMS affects the Emotional Regulation of the female. Various studies have conducted on PMS in the West and a very little number of research studies have been conducted in Asia.

As per the estimated, around 14.3 to 74.4% of women in India likely suffer from PMS. The prevalence of PMS was found to be 86% in study by (Manishsa Upadhyay, 2023) and 39.6% prevalence of PMS in the study done by Badkur et al., (2018). This study tried to bridge the gap prevailing in the literature regarding the prevalence rate of PMS and to investigate the relationship with emotional regulation. Data produced from this study tried to show the importance of women health and tried to bring insight in the society about same.

Objectives

1. To find out the prevalence and severity level of Premenstrual syndrome (PMS) among the female students.
2. To study the Emotion regulation of female students.
3. To examine the association of Premenstrual syndrome (PMS) with Emotional regulation of female students.

Hypotheses

H1: There would be significant association between premenstrual syndrome with emotional regulation of female medical students.

H2: There would be significant association between physiological symptoms and psychological symptoms of PMS.

H3: There would be significant correlation between Cognitive reappraisal and Expressive suppression on ERQ.

Method Design

Quantitative research approach was used in this study. To quantify the data cross-sectional survey design was utilized by the researcher where a set of information regarding individuals' perceived economic status and their group identification was collected for a sample at one point in time.

Participants

Two hundred twenty adult people from rural and urban parts of Aligarh, Uttar Pradesh, India, participated in the study. At inception, 250 adult people were approached to take part in the study and 228 agreed to do so. Twenty-Two participants were not able to go through the complete survey due to their time constraints and personal reasons.

Measures

Socio-demographic and PMS Related Parameters Data Sheet–

Socio-demographic datasheet (age, sex, Religion, occupation, family income, type of family, relationship status and residence) and PMS related parameter datasheet (height, weight, menstrual cycle length, alcohol habits, family history of PMS, sweet intake, caffeine consumptions, sleep duration, tea consumptions, etc.) was specially designed for the purpose of the study.

Premenstrual Syndrome Scale (Ms. P. Padmavathi, et al, 2014)

The premenstrual scale consists of 40 questions with 3 sub scales: Physiological symptoms, Psychological symptoms & Behavioural symptoms. Inter-rater reliability between 0.81 and 0.97 is reported. This 5-point Likert-type scale consisting of 40 items. The measurement on the scale are set according to the following scoring system: the response Never was scored as '1', rarely as '2', sometimes as '3', very often as '4' and always as '5'. In addition, the total score obtained from the sub-scales established the 'PMSS total score'. The lowest score is 40 and highest is 200. If the scale's total score reached 80 points or above, this indicates the occurrence of PMS. Increases in the scores indicates an increase in PMS severity.

Emotional Regulation Questionnaire (ERQ) - Gross & John (2003).

A 10-item scale designed to measure respondents' tendency to regulate their emotions in two ways: 1} Cognitive Reappraisal 2} Expressive Suppression. Respondents answer each item on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Scoring: Items 1,3,5,7,8,10 make up the Cognitive Reappraisals facet. Items 2,4,6,9 make up the Expressive Suppression facet. Scoring is kept continuous.

Procedure

The participants of the study were taken from different university of Madhya Pradesh. The Prior permission was taken from Ethical Committee of University to carry out the study. The participants were made aware about the

study and informed consent was given to them; they were interviewed for gathering the socio-demographic information, others important details for PMS parameters and then they were evaluated on Premenstrual Syndrome Scale (PMSS) and Emotional Regulation Questionnaire (ERQ).

Statistical Analysis

The collected data were analysed by the statistical software Statistical Package for Social Sciences (SPSS) version 26 (for windows). In descriptive statistics, mean and standard deviation were calculated for continuous variables while number and percentage were calculated for categorical or discrete variables. To see correlation between dimensions of PMS and ERQ, between (PMS and ERQ) Pearson(r) correlation was used.

Results

Table 1

Shows the score of Emotional Regulation (N=220).

| | Minimum | Maximum | Mean | SD |
|------------------------|---------|---------|-------|------|
| ERQ | 17 | 61 | 40.64 | 8.05 |
| Cognitive Reappraisal | 9 | 40 | 21.68 | 6.67 |
| Expressive Suppression | 7 | 30 | 15.82 | 5.12 |

Table 1 shows the minimum score obtained by the participants on Emotional Regulation (ERQ) is 17 and maximum score is 61. The mean and SD is 40.64 and 8.05 respectively. The ERQ is divided into two parts 1) Cognitive reappraisal and 2) is Expressive suppression. The minimum score for cognitive reappraisal is 9 and maximum is 40. The mean and SD of cognitive reappraisal is 21.68 and 6.67 respectively. Minimum score of expressive suppression is 7 and maximum is 30. The mean and SD of expressive suppression is 15.82 and 5.12 respectively.

Table 2

Shows the Pearson Correlation Coefficients of PMS, ERQ with PMS Related Parameter (N=220).

* Significant at < 0.05 level

| Variables | BMI | Age | Menarche Age |
|-----------|--------|--------|--------------|
| PMS | -0.010 | -0.118 | -0.068 |
| ERQ | -0.027 | 0.115* | 0.069 |

Table 2 shows the correlation between various variables. The table shows the correlation between PMS and BMI as -0.010, which means that there is no significant correlation between the two variables. Similarly, the correlation coefficient between PMS and age is -0.118, indicating no significant correlation. The correlation coefficient between PMS and menarche year is -0.068, which is also insignificant.

Table 3

Shows the Pearson Correlation Coefficient correlation between different variables of the studies(N=220).

| S.no | Variables | r value (Pearson) |
|------|---|-------------------|
| 1 | Between PMS and ERQ | -0.012 |
| 2 | Between Physiological and Psychological symptoms of PMS | 0.595** |
| 3 | Between Physiological and Behavioural symptoms of PMS | 0.630** |

| | | |
|---|--|---------|
| 4 | Between Psychological and Behavioural symptoms of PMS | 0.798** |
| 5 | Between Cognitive Reappraisal and Expressive Suppression of ERQ. | 0.225* |

* Significant at < 0.05 level

** Significant at < 0.01 level

Table 3 shows correlation between various variables. There is an insignificant negative correlation ($r=-0.012$) between PMS and ERQ, suggesting that there is no linear relationship between these two variables. There is significant positive correlation ($r=0.595$) between physiological and psychological symptoms of PMS, as well as a significant positive correlation ($r=0.630$) between physiological and behavioural symptoms of PMS. There is also a significant positive correlation ($r=0.798$) between psychological and behavioural symptoms of PMS. In addition, the table also reports a positive correlation ($r=0.225$) between cognitive reappraisal and expressive suppression of ERQ, which is significant at the 0.05 level.

Discussion

The present study was conducted to analyse the Prevalence of PMS and its association with Emotional Regulation in Female students. The findings of the present study are supported by those reported by Malhotra et al. (2020), who conducted a cross-sectional study to assess PMS and its impact on health-related quality of life among 235 randomly selected young students in Uttarakhand, India. The results indicated that the mean age of the participants was 21 ± 1.7 years. Furthermore, 21% of the participants reported very severe PMS symptoms, followed by 27% with severe symptoms, 3% with moderate symptoms, and 17% with mild symptoms. It was also found that participants who were suffering from PMS had moderately negative impact on health-related quality of life.

The study found that the most common symptoms were Mood swings (61.4%), generalised aches & pain (41.7%), muscles and joint pain (41.3%), loss of concentration (40.30%), abdominal cramps (55.4%), irritability (33.6%), easy crying (38.7%) and aggression (34.3%). Among physiological symptoms most common was abdominal cramps, mood swings from psychological symptoms and Lack of interest in usual activities was from behavioural symptoms. The present study finding is supported by the study results of Bhuvanewari, et. al., (2019) reported that body, muscle and joint aches (71.3%) followed by abdominal heaviness and discomfort (64.3%) were the most common PMS experienced by college students.

Result showed there is an insignificant negative correlation ($r=-0.012$) between PMS and ERQ. Existing literature shows contradictory result from this study result, showing significant association between PMS and ERQ, the study published in the Journal of Affective Disorders in 2020 also found a negative correlation between PMS and emotional regulation. The study used the Positive and Negative Affect Schedule (PANAS) to measure emotional regulation, and found that women with more severe PMS symptoms reported lower levels of positive affect and higher levels of negative affect, indicating poorer emotional regulation (Barbosa et al., 2020). As per one of the studies Journal of Psychosomatic Obstetrics and Gynaecology in 2019, also concluded that there was a negative correlation between PMS and emotional regulation.

One possible explanation for this negative correlation is that the hormonal changes that occur during the menstrual cycle may affect brain regions involved in emotional regulation. For example, research has shown that fluctuations in estrogen and progesterone levels can affect the activity of the amygdala, a brain region that plays a key role in emotional processing. Furthermore, during the luteal phase of their menstrual cycle, the women with PMS may experience more intense negative emotions, which can make it more difficult to regulate their emotions effectively. Overall, this suggest that PMS symptoms are negatively correlated with emotional regulation, and that women with more severe PMS symptoms may experience greater difficulties in regulating their emotions.

It was further found that there is a significant positive correlation between physiological & psychological symptoms of PMS and result of this study is supported by: A study in the Journal of Obstetrics and Gynaecology Research which concluded that women who experienced more severe physical symptoms of PMS also reported more severe psychological symptoms. (Matsumoto K, 2010). Another study in the Journal of Women's Health and Gender-Based Medicine reported that the women who reported more severe physical symptoms of PMS also reported more severe psychological symptoms, such as irritability, anxiety, and depression. The study was conducted by researchers (Hantsoo A, 2015). The result clearly found that there was an significant positive correlation b/w Cognitive Reappraisal and Expressive Suppression on ERQ and the findings fits well with the existing literature. Several studies have further reported to have found significant positive association between Cognitive Reappraisal and Expressive Suppression, indication that the individuals who use one strategy tend to use the other as well. For example, a study by Gross and John (2003) found that individuals who reported using expressive suppression more frequently also reported using cognitive reappraisal more frequently, indicating a positive association between the two strategies. Similarly, a meta- analysis by Aldao, Nolen-Hoeksema, and Schweizer (2010) concluded that there was a moderate positive correlation between cognitive reappraisal and expressive suppression across studies. The authors suggested that this positive association may reflect a broader tendency to regulate emotions in general, rather than a specific relationship between these two strategies. Overall, while there is evidence to suggest a positive association between Cognitive Reappraisal and Expressive Suppression, the nature of this relationship may vary depending on the context and individual differences.

Conclusion

The present study reveals a significant prevalence of **Premenstrual Syndrome (PMS)** among female students, with **48%** of participants reporting severe or very severe symptoms. These findings, supported by the research of Malhotra et al. (2020) and Bhuvaneshwari et al. (2019), underscore the

substantial burden PMS places on the health-related quality of life for young women. Dominant symptoms identified span psychological (mood swings), physiological (abdominal cramps and muscle pain), and behavioural (lack of interest) domains.

A critical finding is the **significant positive correlation** between physiological and psychological symptoms. This indicates that as physical pain intensifies, psychological distress—such as irritability and aggression—increases proportionally, reinforcing the multifaceted nature of the syndrome.

Regarding **Emotional Regulation (ER)**, the study found an insignificant negative correlation ($r = -0.012$) with PMS. While this specific result deviates from broader literature—which typically suggests that hormonal fluctuations affecting brain regions like the **amygdala** impair regulatory capacity (Barbosa et al., 2020)—it highlights the complexity of these interactions.

Finally, the results demonstrate a **significant positive association** between **Cognitive Reappraisal** and **Expressive Suppression**. This suggests that the female students do not rely on a single strategy but rather possess a general regulatory tendency. This aligns with the work of Gross and John (2003), suggesting that those who actively reframe their thoughts are also likely to manage their emotional expressions. Overall, the study confirms that while regulatory strategies are linked, the biological impact of PMS remains a potent challenge to emotional stability.

Limitations

The study primarily relies on self-reported data, which may be subject to recall bias and variations in the subjective interpretation of symptom severity. Its cross-sectional design prevents the establishment of causal links between hormonal shifts and emotional regulation. Furthermore, the homogenous sample of female students limits generalizability to broader populations. The study also lacks control over confounding variables, such as lifestyle factors (diet, sleep) and pre-existing psychological conditions, which may have contributed to the insignificant correlation found between PMS and ERQ, contrary to existing literature.

Future Suggestions

Future research should adopt longitudinal designs to track symptoms across multiple cycles and incorporate biological markers (hormonal assays) for objective validation. Expanding the demographic scope to include diverse age groups and professional backgrounds is essential. Finally, investigating targeted interventions, such as Cognitive Behavioral Therapy or mindfulness, could provide practical support for managing the emotional and physiological challenges of PMS.

Declarations

Authors' Contributions

The authors have made significant contributions to the generation of ideas, the refinement of concepts, and the gathering, analyzing, and interpreting of data.

Ethical Considerations

Ethical standards outlined in the APA's code of conduct (APA, 2002) were followed.

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Conflicts of Interest

There are no conflicts of interest among the authors.

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