



Prevalence, Impacts and Medical Managements of Premenstrual Syndrome in Adult Women

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Abstract:

A persistent, mild psychological and physical ailment that appears during the luteal phase of feminine periods and goes away with menstruation is called premenstrual syndrome. Headaches, numbness, increased limb sensitivity, palpitations, lightheadedness, and gastrointestinal and ophthalmic symptoms are some of the symptoms of PMS and PMDD. Specific criteria underlying the diagnosis of PMDD have been defined by the DSM-4. These criteria state that at least five of the seven symptoms must be present during the luteal phase of the menstrual cycle in order to be diagnosed with PMDD. A cross-sectional investigation on the prevalence, effects, and medical therapy of premenstrual syndrome in adult women is the goal of this research. Figuring out the prevalence, consequences that are along with recognizing PMS-related traits such as signs of trouble, and symptoms in participants as well as learning about their coping mechanisms to manage symptoms are the goals. After receiving the institutional ethical committee's clearance and the subjects' informed consent, this study was carried out. Data was gathered on a specially created data collecting form following the individuals' enrollment. Details about each participant in this study, including demographics, comorbidities, social history, menstrual cycle information, and coping mechanisms, were gathered using a standard form questionnaire to determine the prevalence, effects, and coping mechanisms employed by the participants to manage their symptoms. A subsequent assessment of the individuals' premenstrual syndrome prevalence and the effect of PMS symptoms on academic achievement was conducted. The data that was gathered was examined and explained using statistical tools.

Keywords: PMS (Premenstrual syndrome), Luteal phase, PMDD (Premenstrual Dysphoric Disorder), DSM 4 criteria (Diagnostic and statistical manual of mental ailments).

1. Background:

A persistent, mild psychological and physical ailment that appears during the luteal phase of menses and goes away with menstruation is called premenstrual syndrome. About 20–32% of women in their premenopausal stage are affected. A significant portion of women who are of reproductive age suffer from PMDD and PMS. Three to eight percent of premenopausal women suffer with PMDD, which causes symptoms that seriously limit social or professional functioning [1]. On the other hand, PMS is characterized by physical symptoms that appear throughout the menstrual cycle as well as psychological symptoms like mood swings, depression, anxiety, and irritability [2]. Women who suffer from PMS and PMDD may exhibit a variety of physiological and

physical symptoms. These may include headaches, bloating, mood swings, exhaustion, irritability, and breast tenderness. The relationships and general well-being of women can be significantly impacted by severe PMDD symptoms [3]. Higher levels of aldosterone and plasma renin activity, neurotransmitter abnormalities, especially involving serotonin, and an enhanced sensitivity to typical changes of estrogen and progesterone during the menstrual cycle are some of the hypothesized reasons of PMDD [4].

Women can use the Daily Record of Severity of Problems (DRSP), a useful self-report instrument, to monitor the occurrence and severity of premenstrual symptoms that meet the DSM's criteria for PMDD [5]. The hallmark of PMS is the cyclical recurrence of different symptoms, which can happen at any age from adolescence to menopause but are most frequently observed in women between the ages of 25 and 35 [6]. Mood swings, despair, anxiety, and irritability are among the psychological symptoms of PMS, although breast tenderness and bloating are common physical symptoms. In particular, during the premenstrual phase, higher levels of estradiol were associated with less indications of positive mood and more symptoms of negative mood. This implies that elevated levels of progesterone and estradiol may make women's PMS symptoms worse [7]. The cyclical recurrence of psychological symptoms like irritability, nervousness, agitation, rage, insomnia, difficulty concentrating, extreme weariness, melancholy, anxiety, and disorientation characterize PMDD, which is the severe end of the PMS range [8].

Many women suffer from PMS and PMDD, which cause a variety of physical and emotional symptoms that can seriously interfere with day-to-day functioning. Both disorders have a cyclical pattern, with symptoms usually appearing during the menstrual cycle's luteal phase and going away once menstruation starts [9]. A common cyclical condition that affects young and middle-aged women is PMS. Its physical and mental symptoms usually appear during the luteal phase of the menstrual cycle [10]. It has long been known that premenstrual issues affect women all over the world. The clinical intensity of the symptoms, notable differences in symptom severity between the pre- and post-menstrual phases, and the timing of the symptoms in relation to the menstrual cycle must all be assessed by the patient in order to diagnose PMS [11]. There are no widely recognized standards for identifying and classifying these illnesses, despite their frequency [12]. Headaches, numbness, increased limb sensitivity, palpitations, light-headedness, and gastrointestinal and ophthalmic symptoms are some of the symptoms of PMS and PMDD. Affected women's everyday functioning may be impacted by these symptoms, which can have a neurologic and vascular component [13]. Specific criteria for the diagnosis of PMDD have been defined by the DSM-IV. These criteria state that at least five of the seven symptoms listed must be present during the luteal phase of the menstrual cycle in order to be diagnosed with PMDD [14]. In contrast to the DSM-IV criteria for PMDD, which call for a total of five symptoms plus one severe mood symptom, the minimum requirement is one physical symptom and one mood symptom, ranging from mild to severe [15].

2. Study Methods:

2.1. Study design: A Cross-sectional study.

2.2. Duration of the study: The study took place from July 2023 to March 2024.

2.3. Study Site: Multiple sites.

2.4. Study Population:

- The study will be conducted at multiple sites.
- Recruitment will stop when approximately 400 samples are collected.
- It is expected that approximately 500 samples will be enrolled to produce evaluable results.

2.5. Inclusion Criteria:

1. Female participants aged 18 to 25 years.
2. Those who had given their voluntarily agreement to participate by signing an written informed consent.

2.6. Exclusion Criteria:

1. Absence of menstruation (amenorrhea).
2. Irregular menstrual cycles.
3. Diagnosed with polycystic ovarian disease (PCOD).

2.7. Study Design: The study was conducted in various work places & colleges. A cross-sectional study was carried out in various work places and colleges from June 2023 to March 2024 for a period of 10 months among adult menstruating women. This study was carried out following approval from the institutional ethics committee and after obtaining informed consent from the participants. The subjects were chosen according to the established inclusion and exclusion criteria. Those who met the inclusion criteria were included in the study. After enrolling the subjects, data was collected on a specially designed data collection form. In this study each participant details like demographic details, comorbidities, social history, menstrual cycle details and coping strategies used by the subjects and standard form questionnaire was asked to assess the prevalence, impacts and coping strategies used by the participants to overcome the symptoms were collected. Later evaluation of prevalence of PMS among participants and impact of PMS symptoms on academic performance was done. Using statistical software, the collected data were analyzed and elucidated.

3. Study Operation:

Data will be collected using Semi – structured, self – administered questionnaire using DSM IV Criteria.

3.1. The DSM IV criteria:

3.1.1. Criterion A: A diagnosis requires at least any 5 of the following 11 symptoms, including at least 1 from the first 4 symptoms:

1. A significantly depressed mood, a sense of despair, or self-critical thoughts
2. Pronounced feeling of anxiousness, feeling tensed, or feeling excessively on edge.
3. Noticeable mood swings or emotional instability.
4. Continuous anger, feeling irritable, or frequent conflicts with others.
5. Loss of interest in routine activities (e.g., work, school, socializing, or hobbies).
6. Difficulty in concentrating.
7. Fatigue, low energy, or lack of motivation.
8. Significant changes in hunger, either overeating, or strong food cravings.
9. Sleep disturbances (either sleeplessness or excessive sleep).

- 10. Experiencing a sense of being overpowered or unable to manage. Physical symptoms including breast tenderness or swelling, headaches, joint or muscle discomfort, bloating, or weight increase.

3.1.2. Criterion B: The symptoms should be intense enough to cause considerable interference with social life, work, school, or sexual relationships.

3.1.3. Criterion C: Symptoms must be clearly tied to the menstrual cycle and should not simply be an exacerbation of an existing mental health condition (such as major depressive disorder, anxiety disorders, or personality disorders), though they may occur alongside them.

3.1.4. Criterion D: Diagnosis is confirmed through everyday symptom tracking for at least 2 consecutive menstrual cycles, though a preliminary diagnosis may be given beforehand [11].

3.2. Statistical Analysis: The data was analyzed using Microsoft Office Excel, employing the Student's R-squared value and P-value tests for analysis.

3.3. Sources of Data: Data was collected from various Colleges, Universities, Family members, Neighbors etc. We have explained about PMS it's impacts and medical management to the participants regarding the study, and those who are willing to provide informed consent form to our study those subjects are considered.

4. Results:

Table 1: Demographic and Social Characteristics of the Participants

Variables	Category	n	%	PMS	NON-PMS
Age group	18-20	307	76.75	148 (78.31%)	159 (75.35%)
	21-23	86	21.50	35 (18.52%)	51 (24.17%)
	24-25	7	1.75	6 (3.17%)	1 (0.47%)
Residence	Urban	253	63.25	120 (63.49%)	133 (63.03%)
	Rural	147	36.75	69 (36.51%)	78 (36.97%)
Education level	Postgraduate	46	11.5	163(86.24%)	191(90.52%)
	Undergraduate	354	88.5	26 (13.76%)	20 (9.48%)
Marital status	Married	9	2.25	6 (3.17%)	3(1.42%)
	Unmarried	391	97.75	183 (96.82%)	208 (98.58%)

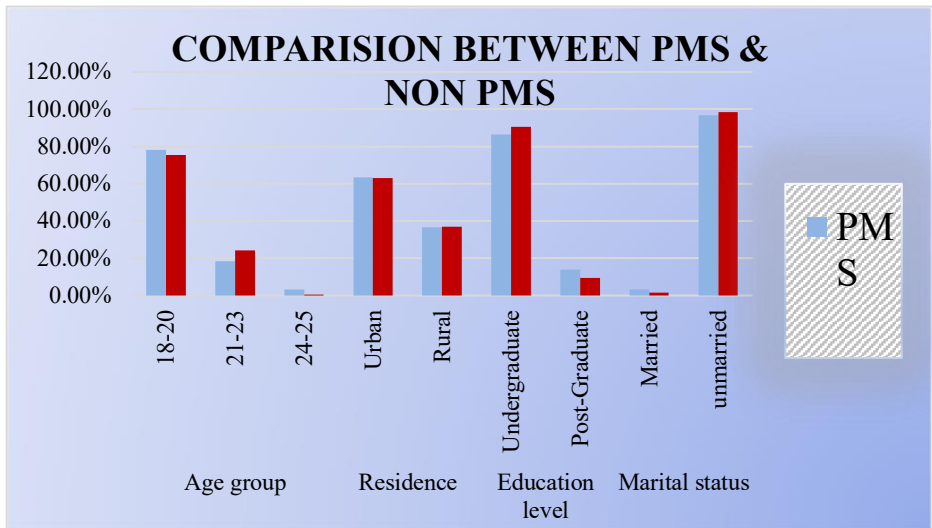


Figure 1: Showing Comparison of Socio demographics of participants

Table 2: The characteristics of menstrual cycles in the study participants.

Variables	Category	n	PMS	NON-PMS	Percentage (%)
Length of the cycle	25-31 days	303	144 (76.19%)	159 (75.35%)	75.75
	31-35 days	97	45 (23.81%)	52 (24.64%)	24.25
Number of days bleeding lasts	3-7 days	385	178 (94.18%)	207 (98.1%)	96.25
	more than 7 days	15	11 (5.82%)	4 (1.89%)	3.75
Blood flow type	Less	27	13 (6.879%)	14 (6.64%)	6.75
	Normal	330	145 (76.72%)	185 (87.68%)	82.5
	Heavy	43	31 (16.4%)	12 (5.69%)	10.75

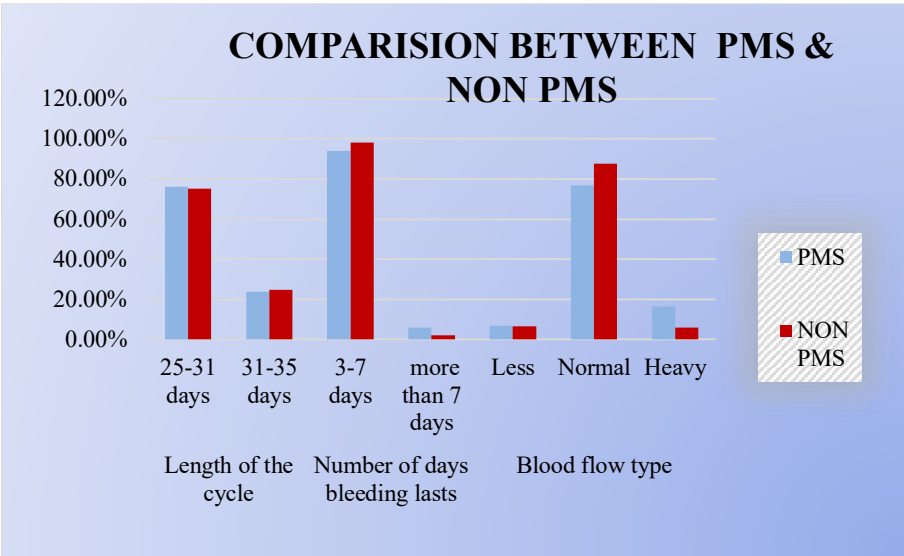


Figure 2: Showing comparison of menstrual characteristics of participants

Table 3: The lifestyle characteristics of the participants.

Variables	Categor y	n	Percentag e (%)	PMS	NO PMS
Physical activity (any form of exercises)	No	332	83	32 (16.93%)	36 (17.06%)
	Yes	68	17	157 (83.07%)	175 (82.94%)
Smoking (active/passiv e)	No	400	100	0 (0%)	0 (0%)
	Yes	0	0	189 (100%)	211 (100%)
Alcohol	No	398	99.5	0 (0%)	2 (0.95%)
	Yes	2	0.5	189 (100%)	209 (99.05%)
Tobacco chewing	No	400	100	0 (0%)	0 (0%)
	Yes	0	0	189 (100%)	211 (100%)

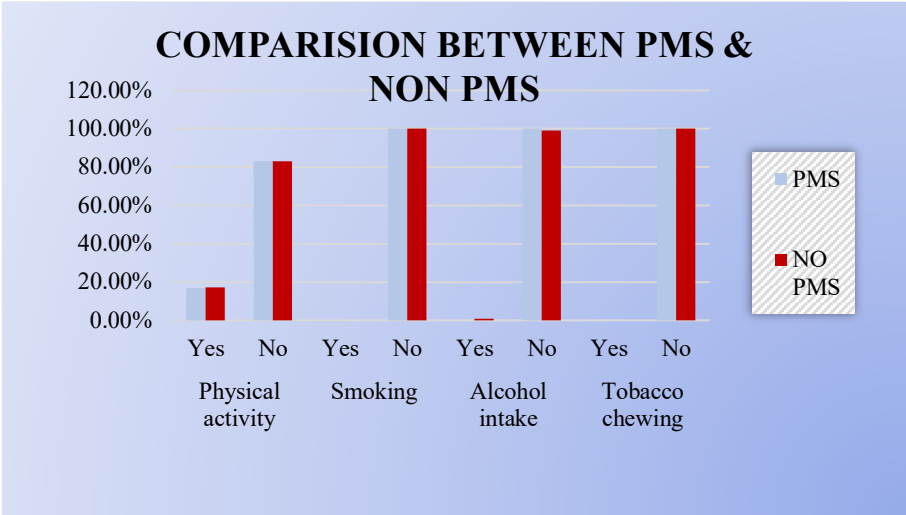


Figure 3: Showing comparison of lifestyle characteristics of participants

Table 4: Physical symptoms comparison between PMS & NON-PMS

SYMPTOMS	Category	PMS	NON-PMS
Breast tenderness	Yes	24(12.7%)	17 (8.06%)
	No	165(87.3%)	194(91.94%)
Headache	Yes	48 (25.4%)	27 (12.80%)
	No	141(74.6%)	184 (87.20%)
Back pain	Yes	124 (65.6%)	112 (53.08%)
	No	65(34.4%)	99 (46.92%)
Abdominal cramps	Yes	129 (68.25%)	106 (50.24%)
	No	60(31.74%)	105 (49.76%)
General body pain	Yes	103(54.5%)	77 (36.49%)
	No	86(45.5%)	134 (63.51%)
Joint pain	Yes	65(34.40%)	47(22.27%)
	No	124 (65.6%)	164 (77.72%)
Nausea	Yes	25(13.22%)	15 (7.11%)
	No	164 (86.77%)	196 (92.90%)
Vomiting	Yes	20 (10.58%)	11(5.21%)
	No	169 (89.42%)	200 (94.79%)
Abdominal bloating	Yes	54 (28.57%)	38 (18.01%)
	No	135(71.43%)	173 (82%)
Constipation	Yes	19 (10.05%)	17 (8.06%)
	No	170 (89.95%)	194 (91.94%)
	Yes	92 (48.68%)	55 (26.07%)

Fatigue	No	97 (51.32%)	156 (73.93%)
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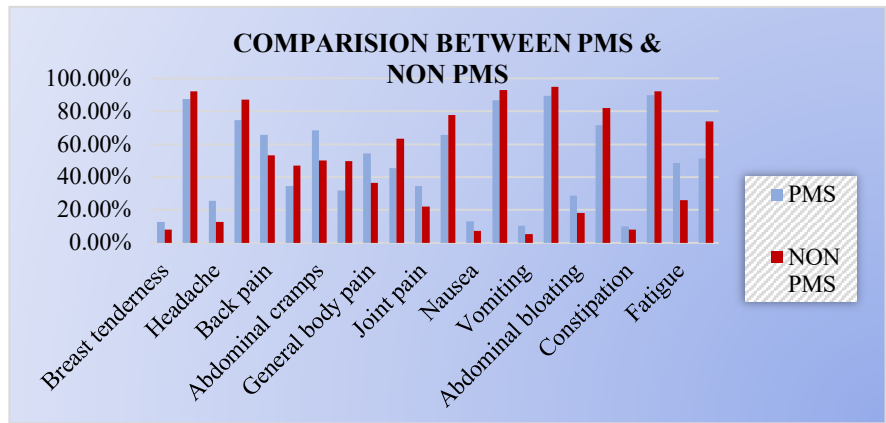


Figure 4: Showing physical symptoms comparison between PMS & NON-PMS

Table 5: Psychological symptoms comparison between PMS & NON-PMS

SYMPTOMS	Category	PMS	NON-PMS
Depressed mood	Yes	89 (47.09%)	45 (21.33%)
	No	100 (52.91%)	166 (78.67%)
Anxiety/worry	Yes	79 (41.8%)	34 (16.11%)
	No	110 (58.2%)	177 (83.89%)
Mood swings	Yes	105 (55.55%)	69 (32.7%)
	No	84 (44.44%)	142 (67.3%)
Irritability	Yes	107 (56.61%)	78 (36.97%)
	No	82 (43.39%)	133 (63.03%)
Anger	Yes	104 (55.03%)	71 (33.65%)
	No	85 (44.97%)	140(66.35%)
Poor concentration	Yes	87 (46.03%)	37 (17.53%)
	No	102 (53.97%)	174 (82.46%)
Loss of interest	Yes	93 (49.21%)	37 (17.53%)
	No	96 (50.8%)	174 (82.46%)
Difficulty in making decisions	Yes	70 (37.04%)	38 (18.01%)
	No	119 (62.96%)	173 (82%)
Difficulty in thinking	Yes	72 (38.1%)	30 (14.22%)
	No	117 (61.9%)	181 (85.78%)
Confused	Yes	61 (32.27%)	30 (14.22%)
	No	128 (67.72%)	181 (85.78%)

Forgetfulness	yes	52 (27.51%)	24 (11.37%)
	no	137 (72.49%)	187 (88.62%)

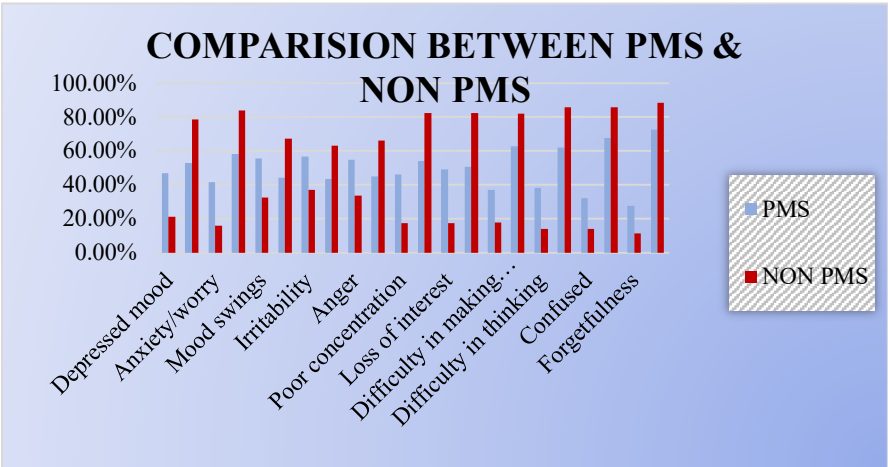


Figure 5: Showing Psychological symptoms comparison between PMS & NON-PMS

Table 6: Behavioral symptoms comparison between PMS & NON-PMS

SYMPTOMS	Category	PMS	NON-PMS
Increased appetite	Yes	61(32.27%)	37 (17.53%)
	No	128(67.72%)	174 (82.46%)
Food cravings	Yes	92(48.68%)	70 (33.17%)
	No	97(51.32%)	141 (66.82%)
Lack of sleep	Yes	78(41.27%)	37 (17.53%)
	No	111(58.73%)	174 (82.46%)
Oversleep	Yes	69(36.5%)	53 (25.12%)
	No	120(63.5%)	158 (74.88%)
Short tempered	Yes	91(48.15%)	38 (18.01%)
	No	98(51.85%)	173 (81.99%)
Uncontrollable anger	Yes	83(43.91%)	36 (17.06%)
	No	106(56.08%)	175 (82.92%)
Avoidance of social contact	Yes	84(44.44%)	41 (19.43%)
	No	105(55.55%)	170 (80.57%)

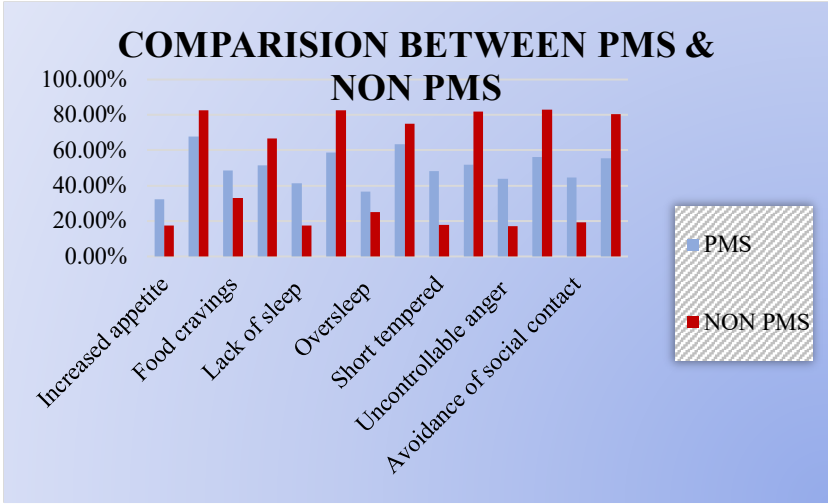


Figure 6: Showing behavioral symptoms comparison between PMS & NON-PMS

Table 7: Effect on academic performance of PMS symptoms on PMS & NON-PMS participants

VARIABLES	CATEGORY	PMS	NON-PMS
Effect on Academic performance	Yes	109 (56.67%)	27 (12.80%)
	No	80 (42.33%)	184 (87.20%)

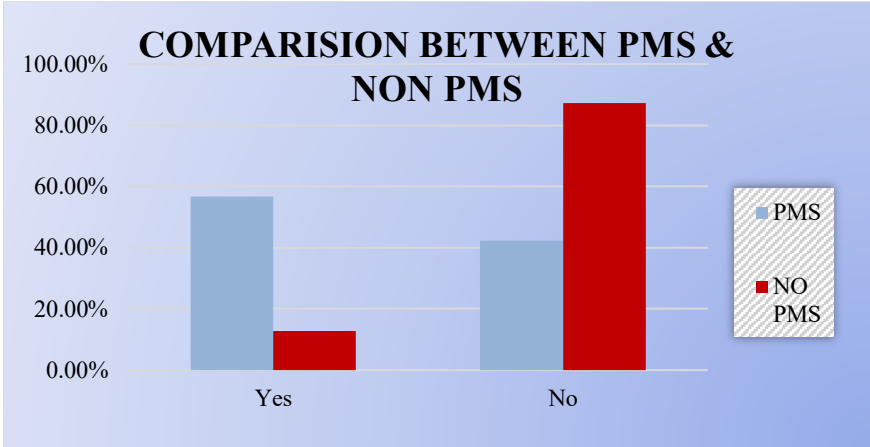


Figure 7: Showing Effect on academic performance of PMS symptoms on PMS & NON-PMS participants

Table 8: Methods/Coping strategies used to overcome symptoms.

Methods/ Coping strategies used	Frequency	Percentage
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Rest/Sleep	138	34.5
Eating sweets/Chocolates	43	10.75
Yoga/ Meditation	34	8.5
Pain Medications	18	4.5
Hot/ Cold pack usage	10	2.5
Intake of fluids	30	7.5
Social media	20	5
Nothing	74	18.5
Others	33	8.25

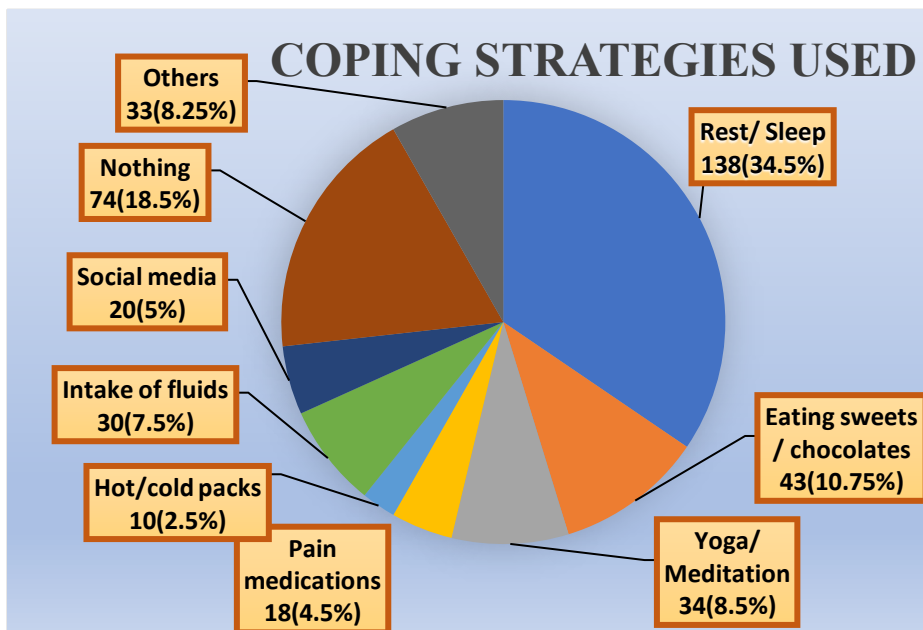


Figure 8: Shows coping strategies used by female students to overcome symptoms

5. Discussion:

Results showed from Table 1, 2, 3, 4, 5, 6, 7, and 8 Figure 1, 2, 3, 4, 5, 6, 7, and 8 respectively, that among 400 participants 189 were prone PMS, majorly they are from the age group of 18-20 i.e. 148 (78.31%). Urban population had more occurrence of PMS i.e. 120 (63.49%) when compared with rural population, undergraduate students are more in number i.e., 163 (86.24%). Prevalence was majorly observed in unmarried women when compared with married women. Participants whose length of cycle ranged between 25-31days i.e. 144 (76.19%) are more prone to PMS when compared with participants whose cycle length is more than 31-35days. Participants whose bleeding days are between 3-7days are more prone to PMS i.e. 178 (94.18%) when compared with participants whose bleeding days are more than 7days. Participants

experiencing normal blood flow are more prone to PMS i.e. 145 (76.72%) when compared with less and heavy bleeding women. Participants people who did not include any kind of physical activity i.e. 157 (83.07%) are more prone to PMS. Smoking, alcohol intake and tobacco chewing are almost zero and are negligible in our study. In physical symptoms backpain, abdominal cramps & general body pains occurrence was high, headache, joint pain & fatigue were moderate and breast tenderness, nausea, vomiting & constipation were low in the participants who were affected by PMS. R square value was found to be 0.730095499. We have tested the distribution using Chi square test in which we have found that there is a difference in distribution of patients in moderate symptoms vs severe symptoms which is evident with the P value 0.00000019780. The ratio between moderate to severe distribution of patients is clearly different, the patients in the moderate are more when compared with severe and the ratio prediction will be same [16].

In psychological symptoms mood swings, irritability and anger are more prominent followed by depressed mood, anxiety, poor concentration, loss of interest, difficulty in making decisions, difficulty in thinking & confusion were moderate, forgetfulness was less common in the PMS affected participants. Regression was performed & the R square value was found to be 0.581092. We have tested the distribution using Chi square test in which we have found that there is a difference in distribution of patients in moderate symptoms vs severe symptoms which is evident with the P value 0.046762797. The ratio between moderate to severe distribution of patients is clearly different, the patients in the moderate are more when compared with severe and the ratio prediction will be same [17].

Majority of the population have moderate complications when compared with severe complications but the prediction values of this ratio may vary from study to study. There was no severe occurrence of behavioral symptoms in PMS prone participants. Moderate occurrence food cravings, short tempered, avoidance of social contact, uncontrollable anger. Less number of participants were prone to oversleep, increased appetite. Regression was performed & the R square value was found to be 0.236976. We have tested the distribution using Chi square test in which we have found that there is no difference in distribution of patients in moderate symptoms vs severe symptoms which is evident with the P value 0.143220873. The ratio between moderate to severe distribution of patients is clearly same, the patients in the moderate are almost equal when compared with severe and the ratio prediction will be different. In this study the population have almost same ratio of behavioral symptoms of moderate complications when compared with severe complications but the prediction values of this ratio may vary from study to study.

109 (56.67%) participants who are prone to PMS felt that their academic performance is being impacted by the occurrence of PMS symptoms. 27 (12.80%) of participants who are not prone to PMS also felt that their educational performance is being affected. 138(34.5%) preferred to rest/sleep to overcome symptoms whereas 74(18.5%) did nothing, 43(10.75%) preferred to eat chocolates/sweets, 34(8.5%) preferred to do yoga/meditation, 30(7.5%) had preferred increased intake of fluids, 20(5%) preferred to use social media, 18(4.5%) preferred usage of pain medications and 10(2.5%) preferred to use hot/cold packs to relieve their symptoms.

6. Conclusion:

Based on the statistical analysis we can conclude that there was a clear difference of distribution of patients in moderate vs severe symptoms in physical, physiological and comparison between PMS and NON-PMS patients. No difference in distribution was observed in behavioral symptoms among moderate and symptoms. 189 participants were diagnosed with PMS according to DSM- IV criteria. Prevalence rate of PMS was found to be 47.25%. Strong association of PMS was observed in physical and physiological symptoms whereas less to no association was found in behavioral symptoms. 57.67% of participants with PMS felt their educational performance is being affected by the occurrence of PMS symptoms. 12.80% of the population without PMS felt their academic performance is being affected by the occurrence of PMS symptoms.

Participants who don't include any form of physical activity in their day-to-day life i.e. 157 (83.07%) are more prone to PMS than participants who included any form of physical activity 32 (16.93%). Participants who preferred to take rest /sleep are less exposed to PMS. Consumption of sweets/chocolates is more in PMS prone participants when compared to NON-PMS participants. People who followed yoga and meditation to overcome their symptoms are less prone to PMS. Pain medication usage was 5 times more in PMS participants than NON-PMS participants. Participants with PMS preferred usage of hot/cold packs 5 times higher than NON-PMS.

References:

1. Biggs WS, Demuth RH. Premenstrual syndrome and premenstrual dysphoric disorder. *Am Fam Physician*. 2011;84(8):918-24.
2. Dickerson LM, Mazyck PJ, Hunter MH. Premenstrual syndrome. *Am Fam Physician*. 2003;67(8):1743-52.
3. Kadian S, O'Brien S. Classification of premenstrual disorders as proposed by the International Society for Premenstrual Disorders. *Menopause Int*. 2012;18(2):43-7.
4. Milewicz A, Jedrzejuk D. Premenstrual syndrome: from etiology to treatment. *Maturitas*. 2006;55 Suppl 1:S47-54.
5. Hammarbäck S, Damber JE, Bäckström T. Relationship between symptom severity and hormone changes in women with premenstrual syndrome. *J Clin Endocrinol Metab*. 1989;68(1):125-30.
6. Freeman EW. Premenstrual syndrome and premenstrual dysphoric disorder: definitions and diagnosis. *Psychoneuroendocrinology*. 2003;28 Suppl 3:25-37.
7. Rapkin A. A review of treatment of premenstrual syndrome & premenstrual dysphoric disorder. *Psychoneuroendocrinology*. 2003;28 Suppl 3:39-53.
8. Kessel B. Premenstrual syndrome: advances in diagnosis and treatment. *Obstet Gynecol Clin North Am*. 2000;27(3):625-39.
9. Frackiewicz EJ, Shiovitz TM. Evaluation and management of premenstrual syndrome and premenstrual dysphoric disorder. *J Am Pharm Assoc (Wash)*. 2001;41(3):437-47.

10. York R, Freeman E, Lowery B, Strauss JF 3rd. Characteristics of premenstrual syndrome. *Obstet Gynecol.* 1989;73(4):601-5.
11. Yonkers KA, O'Brien PM, Eriksson E. Premenstrual syndrome. *Lancet.* 2008;371(9619):1200-10.
12. Brown C, Kulak J, Sullivan C. The role of serotonin in premenstrual syndrome. *J Clin Psychopharmacol.* 2000;20(3):118-28.
13. Freeman EW, Rickels K, Sondheim SJ, et al. The use of serotonin reuptake inhibitors in the treatment of premenstrual dysphoric disorder. *Psychoneuroendocrinology.* 2003;28(3):321-35.
14. Pearlstein T, Steiner M. Treatment of premenstrual dysphoric disorder: a review of the literature. *J Clin Psychiatry.* 2008;69(7):1185-97.
15. Soni A, Driscoll L, Sun S. The effects of lifestyle interventions on premenstrual syndrome: a systematic review. *J Womens Health (Larchmt).* 2014;23(6):485-91.
16. Dutta A, Sharma A. Prevalence of premenstrual syndrome and premenstrual dysphoric disorder in India: a systematic review and meta-analysis. *Health Promot Perspect.* 2021;11(2):161-70.
17. Raval AD, Patel V, Patel R, et al. Prevalence of premenstrual syndrome and premenstrual dysphoric disorder among college students of Bhavnagar, Gujarat. *J Postgrad Med.* 2016;62(3):152-7.

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