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A Study on Severity of Pre-Menstrual Syndrome in Teenage Girls

Sarvani Guntuboyana[1*] and MVR Raju[2]

[1] *Guest Faculty, Department of Psychology, Andhra University, Visakhapatnam, India*

[2]*Senior prof. Head of the Department of Psychology, Andhra University, Visakhapatnam, India*

Abstract

Pre-menstrual syndrome as a psychosomatic problem is faced by every reproductive woman in the late luteal phase of the menstrual cycle. Menstruation is a cyclic process that includes physiological, psychological, and behavioral changes in females that affect their daily living. The researcher would like to measure the severity and prevalence of Pre-menstrual syndrome in reproductive females grouped under two categories 16-17 and 18-19 years in the Visakhapatnam District. There are 250 samples collected using the purposive sampling method. Tools used for data collection were the Pre-Menstrual Syndrome Scale (PMSS). *Chi-square* test and t-test were used through the R Cmdr. Results show that the majority of participants have moderate PMS symptoms, the age category of 16-17 has more PMS problems, and moreover, Intermediate students have more PMS problems than graduate students and also urban respondents have more PMS problems rural area, respondents. The 16-17 age group are intermediate students who prepare for various entrance exams like IIT, JEE, NEET, etc. and they have high pressure and academic stress in college. And also, in urban areas participants have lack of physical activity, eating junk food, etc. may lead to physiological and psychological symptoms *i.e.,* food cravings, abdominal cramps, dizziness, irritability, mood swings insomnia of premenstrual syndrome. And also 16-17 years of age is the transmission age so they have more behavioral problems *i.e.,* impaired work performance, irrational thoughts, being over-sensitive, inconvenient and uncomfortable, etc. Finally, 16-17 years reported that they have experienced a high level of symptoms associated with pre-menstrual syndrome. And also, urban area participants have high pre-menstrual syndrome than rural area participants. Intermediate students have high pre-menstrual syndrome than graduates.

Keywords: Pre-menstrual syndrome; PMSS; Psychological; Physiological; Behavioural; Emotional

Introduction

Pre-menstrual syndrome is a psychosomatic problem which is manifested in females during late luteal phase of menstrual cycle. The characteristics of pre-menstrual syndrome is experienced in almost all women in reproductive phase. Menstrual cycle is a complex phenomenon that occurs in reproductive females which is controlled by glands and hormones that these hormones produce. The main four phases of menstrual cycle are namely: 1) Menstruation 2) The follicular phase 3) Ovulation 4) Luteal phase [1].

Menstruation is the process of eliminating menstrual fluid which contains blood and mucous from uterus through vagina. The length of this period is usually between three days to one week. Follicular phase starts from the day one of menstruation where Follicular Stimulating Hormone (FSH) from pituitary gland is released in order to produce follicles which will later turn into an egg that facilitates pregnancy. The third stage ovulation is the process of releasing an egg from the ovary. Ovulation is a crucial process that occurs mid cycle or two weeks before menstruation begins. Fertile window, the probability of getting pregnancy can be known by keeping a track of ovulation during menstrual cycle. Luteal phase is utmost important where the levels of progesterone along with small amounts of estrogen increases to facilitate pregnancy. If sperm cell not fused with the egg, the corpus luteum withers and dies which results in the drop of progesterone hormone. This is the final stage and critical period during menstrual cycle [2]. Some of the more common menstrual problems include:

PMS: Hormonal events before a period can trigger a range of side effects in women at risk, including fluid retention, headaches, fatigue and irritability. Treatment options include exercise and dietary changes.

Dysmenorrhoea or painful periods: It is thought that the uterus is prompted by certain hormones to squeeze harder than necessary to dislodge its lining. Treatment options include pain relieving medication and the oral contraceptive pill.

Heavy menstrual bleeding: Previously known as menorrhagia if left untreated, this can cause anaemia. Treatment options include oral contraceptives and a hormonal Intrauterine Device (IUD) to regulate the flow.

Amenorrhoea or absence of menstrual periods: This is considered abnormal, except during pre-puberty, pregnancy, lactation and post menopause. Possible causes include low or high body weight and excessive exercise [3].

The physical and psychological symptoms of pre-menstrual syndrome are:

Physical symptoms: Headache, bloating, uterine cramps, disturbed sleep schedule etc.

Psychological symptoms: Irritability, tension, depressed mood, mood swings etc.

***Corresponding author:** Sarvani Guntuboyana, Department of Psychology, Andhra University, Visakhapatnam, India, E-mail: gsarvani33@gmail.com

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Behavioural symptoms: Social withdrawal, restlessness, lack of self-control etc.

Pre-menstrual syndrome is widely known for its hormonal fluctuations of menstrual cycle. Due to low levels of serotonin, the neurotransmitter and estrogen that fluctuate during the luteal phase are responsible for the changes of mood in women. The decreased estrogen causes the hypothalamus to release norepinephrine which in turn decreases acetylcholine, dopamine and serotonin that leads to insomnia, fatigue, headache, mood swings and depression which are common for both pre-menstrual syndrome and pre-menstrual dysphoric disorder. Signs and symptoms of pre-menstrual syndrome changes in every individual depending upon their cyclic hormonal change during every period [4].

In addition, psychological well-being has been tied to better physical health. A positive mindset has been linked to decrease in cardiovascular disorders or complications. This is likely due to a desire to take care of yourself if you have higher levels of psychological wellness. Another benefit of psychological well-being is a better social life. If you are content with your life and feel good about yourself, you're more likely to engage in social activities with others and seek people out for companionship. This benefit is also two-fold, as having close relationships has been found to improve mental health and contribute to a better psychological well-being. Also, Pre-menstrual syndrome is seen in women who live in a stressful condition whose family is detected with a history of depression or seen in a person who experienced Post-Partum Depression (PPD) [5].

Materials and Methods

The purpose of this study was to review the risk of suicide in women with PMS as they experience decreased quality of life. A systematic review and meta-analysis was conducted by searching the literature in 3 databases (PubMed, PsycINFO, and EMBASE) on July 15, 2020. Studies include that assessment of the relationship between suicidality and premenstrual were included. Findings show that women with PMDD and PMS are at higher risk of suicidality compared with women without premenstrual disturbances. The aim of this study was to investigate the impacts of garlic as a herbal medicine on the severity of premenstrual symptoms. The study was a double-blind, randomized, controlled trial. After identification of participants with moderate-to-severe PMS through the Premenstrual Symptoms Screening Tools questionnaire (PSST), they were randomly assigned to placebo (n=64) or garlic (n=65) groups. Each participant received one tablet daily for three consecutive cycles and logged the severity of their symptoms in the PSST questionnaire during the intervention period. There was no significant difference between the two groups in the baseline level of premenstrual symptoms before the intervention. After treatment with garlic for three consecutive cycles, the total score of the severity of premenstrual symptoms reduced. The findings show the potential effect of garlic in reducing the severity of premenstrual symptoms; therefore, the use of garlic can be considered as an alternative therapy in the prevention and treatment of premenstrual disorders [6].

The objective of this study was to investigate the relationships between Pre-menstrual syndrome and lifestyle, sleep, dietary habits among Japanese high school students. Sampling was done on 2840 students in two public high schools in Sendai, Japan. Self-administered questionnaire was used. The final findings say that the risk factors for PMS were menstrual pain, stress fracture and internet use time. Belonging to a sports club decreases the risk of PMS. This shows that sleep, dietary habits, belonging to sports club and screen time affects PMS among high school girls. The objectives of the study was to determine the prevalence of PMS and depression, determine the effect of foot reflexology and hot foot bath on premenstrual syndrome and depression [7]. A quantitative research approach with true experimental pre-test post-test control group design was adopted. 6 colleges were assigned randomly to experimental group I, II and control group using simple random sampling technique. Estimated sample size was 180 with 60 samples in each group. The moos menstrual distress questionnaire, IPAT questionnaire for depression, and daily symptom dairy were used to assess premenstrual syndrome and depression. Results show a significant difference in PMS and depression in the post tests of experimental group I and II when compared with the pre-test. The aim of this study was to investigate the relationship between PMS and subjective sleep quality with Pittsburgh Sleep Quality Index (PSQI) in the medical academy students, whom have considerable information about menstruation. PMS was detected with premenstrual syndrome scale and PSQI was used to evaluate subjective sleep quality. *Chi-square* test and Kendall's rank correlation analysis were used in statistical analysis. This study reveals that the females who have moderate to severe levels of pre-menstrual syndrome experience sleeplessness, insomnia, restless leg syndrome and other kinds of sleep deprivation [8].

The aim of this study was to determine the prevalence of factors influencing PMS in first-year students at a university health campus and to evaluate the relationship between depression and PMS. A cross-sectional study was conducted on a population of 618 university students at Dokuz Eylul university, Izmir, Turkey. Data were collected using the Premenstrual Syndrome Scale (PMSS), Beck depression inventory and student identification form [9]. Descriptive statistics, Pearson's *Chi-square* test and *Chi-square* test for trend, and independent samples t-test and logistic regression analysis were used. The results say that PMS was higher in students who had a chronic disease and/or an unhealthy lifestyle. There was a statistically significant relationship between PMS and risk of depression. The objective of the study was to know the prevalence of PMS and to study the factors associated with PMS among medical students. A cross sectional study was conducted among 270 medical students of Basaveshwara medical college, Chitradurga. Self-evaluating questionnaire covering socio-demographic factors like age, place of residence, weight, height and questions on PMS were analyzed. The results show that the prevalence of premenstrual syndrome is high among college students and it is increased with increasing age [10].

The objective of this study was to assess the prevalence of PMS in Thai high school students. This was a prospective study and an anonymous self-report questionnaire was used, which included information about demographic data, menstrual patterns, and symptoms to be recorded on a daily calendar of premenstrual experiences. All of the data was prospectively recorded for 90 consecutive days. Sampling was done on 289 students. The results show that there were significant differences between the PMS and non-PMS groups, and PMS was associated with various problems related to educational activities. There were no significant differences regarding interpersonal relationships between the PMS and non-PMS groups. The most common symptoms reported in this study were angry outbursts and breast tenderness. The aim of this study was to study the prevalence of PMS and PMDD among college students of Bhavnagar (Gujarat), it's associated with demographic and menstrual factors. A cross-sectional survey was done in five colleges of

Bhavnagar. A sample of 489 samples were analyzed for sociodemographic data, menstrual history, and PSST. *Chi-square* test was done for qualitative variables and analysis of variance for quantitative variables. Sensitivity, specificity, and predictive values were calculated for PSST. The results say that prevalence of PMS was 18.4%. Moderate to severe PMS was 14.7% and PMDD was 3.7% according to DSM IV-TR and 91% according to international classification of diseases, 10th edition criteria [11].

Objectives of study

- To find out the severity of pre-menstrual symptoms in teenage girls.
- To find out the significance difference of demographical variables with respect to factors associated with pre-menstrual Syndrome [12].

Hypothesis

- There is a significance difference between age groups with respect to the factors of pre-menstrual syndrome.
- There is a significance difference between Intermediate and graduates with respect to the factors of pre-menstrual syndrome.
- There is a significance difference between rural and urban groups with respect to the factors of pre-menstrual syndrome [13].

Sample

The sample consisted of 250 female teenagers as subjects. The samples were collected using purposive sampling method on selective females between the age of 16-17 and 18-19 divided into two categories. The study was carried in Visakhapatnam district [14].

Procedure

The samples consisted of 250 teenage girls who are categorized into 16-17 years and 18-19 years. The samples were collected using the purposive sampling method. The study was conducted in the urban areas of Visakhapatnam district. Information about the study was gathered based on the symptoms related to pre-menstrual syndrome on the subjects on specially designed semi structure socio-demographic data sheet. The subjects were administered by Pre-Menstrual Syndrome Scale (PMSS) to assess the severity of pre-menstrual syndrome [15].

Statistical analysis

The main objective of the study was to conduct the prevalence and severity of pre-menstrual syndrome in teenage girls and find out the severity and symptoms associated with pre-menstrual Syndrome in the selected samples. *Chi-square* and t-test are used.

Tool

The premenstrual syndrome scale was developed. This scale consists of 40 items and has three sub-dimensions *i.e.,* physical, psychological and Behavioral. The minimum score on the scale is 40 and the highest score is 200. High scores indicate that PMS symptoms are intense. The response pattern is of Likert type *i.e.,* on a five-point scale from always, most often, occasionally, rarely to never: 5 for always, 4 for most often, 3 for occasionally, 2 for rarely and 1 for never. The validity and reliability follows 0.81 and 0.97.

Results and Discussion

Hypothesis I

There is a significant difference among groups in levels of pre-menstrual syndrome

Null hypothesis I

Level of pre-menstrual syndrome equally distributed among groups (Table 1).

Pre-menstrual syndrome	**Frequency**	**Percent**	***Chi-square* value**	**P-value**
Mild	73	30.42	37.95	0.01**
Moderate	122	50.83		
Severe	44	18.75		
Total	240	100		
Note: **Denotes significant at 1% level				

Table 1: *Chi-square* test for goodness of fit of equality of level of pre-menstrual syndrome.

Since P value is less than 0.01, the null hypothesis is rejected at 1% level of significance. Hence, we concluded that level of pre-menstrual syndrome is not equally distributed. Based on %, majority of participants belongs to the moderate level (50.83%). It shows that they are aware of pre-menstrual syndrome but does not affect daily activities.

Hypothesis II

There is a significance difference between age groups with respect to the factors of pre-menstrual syndrome.

Null hypothesis II

There is no significant difference between age groups with respect to the factors associated with pre-menstrual syndrome (Table 2).

PMS domains	**Age**	**N**	**Mean**	**t-value**	**P-value**
Physiological symptoms	16-17	98	38.37	13.78	0.00**

	18-19	142	33.66		
Psychological symptoms	16-17	98	32.34	2.504	0.11
	18-19	142	30.37		
Behavioural symptoms	16-17	98	29.84	3.806	0.05*
	18-19	142	27.49		
PMS total	16-17	98	109.22	5.58	0.01**
	18-19	142	91.53		
Note: *P<0.05, **P<0.01					

Table 2: t-test for significance difference between age groups with respect to the factors associated with pre-menstrual syndrome.

It was observed that the 16-17 of years age group has a high score on physiological symptoms (t=13.78; P<0.01) than the 18-19 of years age group. Moreover the 16-17 of years age group has a higher score on behavioral symptoms (t=3.80; P<0.05) than the 18-19 of years age group. The 16-17 of year's age group has high mean value than the 18-19 years age group but t-value is not a significant value. The 16-17 of years age group has more physiological symptoms *i.e.,* abdominal cramps, weight gain, food craving etc. Moreover, behavioral problems *i.e.,* impaired work performance, irrational thoughts, being over sensitive, inconvenient and uncomfortable etc. indicates that the 16-17 of age group are intermediate students who prepare for various entrance examinations like IIT, JEE, NEET etc, and due to high pressure and academic stress in colleges, this category experienced more symptoms associated with pre-menstrual syndrome.

Hypothesis III

There is a significant difference between educational qualifications with respect to the factors associated with pre-menstrual syndrome.

Null hypothesis III

There is a no significant difference between educational qualifications with respect to the factors associated with pre-menstrual syndrome (Table 3).

PMS domains	Educational qualification	N	Mean	SD	t-value	P-value
Physiological symptoms	Intermediate	83	38.66	7.32	12.78	0.000**
	Degree 1st	157	33.96	10.7		
Psychological symptoms	Intermediate	83	32.01	7.08	0.97	0.32
	Degree 1st	157	30.73	10.58		
Behavioural symptoms	Intermediate	83	29.75	6.91	2.54	0.112
	Degree 1st	157	27.76	10.21		
PMS total	Intermediate	83	100.43	18.1	5.34	0.021*
	Degree 1st	157	92.47	28.47		
Note: *P<0.05, **P<0.01						

Table 3: t-test for significance difference between educational qualifications with respect to the factors associated with pre-menstrual syndrome.

The above Table 2 shows that the t value is 12.78, which is significant at 0.01 levels. There is a significant difference between intermediate students and graduate students with respect to the physiological symptoms *i.e.* increased appetite, pimples, rashes and dizziness etc. The reason here is intermediate students prepare for the entrance examinations like IIT, JEE and NEET and they experience stress at a greater level when compared to graduates.

Hypothesis-IV

There is a significant difference between places of staying with respect to the factors associated with pre-menstrual syndrome.

Null hypothesis IV

There is no significant difference between places of staying with respect to the factors associated with pre-menstrual syndrome (Table 4).

PMS domains	Place	N	Mean	SD	t-value	P-value
Physiological symptoms	Urban	168	36.92	9.13	10.5	0.00**
	Rural	72	32.48	10.98		
Psychological symptoms	Urban	168	31.97	9.65	3.9	0.04*
	Rural	72	29.33	9.01		
Behavioural symptoms	Urban	168	28.91	6.91	1.4	0.23

	Rural	72	27.37	8.22		
PMS total	Urban	168	97.8	25.33	5.81	0.01*
	Rural	72	89.19	25.4		
Note: *P<.05, **P<.01						

Table 4: t-test for significance difference between areal distributions with respect to the factors associated with pre-menstrual syndrome.

There is a significant difference between the rural and urban with respect to the factors associated with physiological (t=10.5; P<0.01) and psychological symptoms (t=3.90; P<0.05). Place of staying in urban area shows the physiological symptoms of pre-menstrual syndrome at a higher rate when compared to the rural area. The reason here is because; the pattern of living and lifestyle in urban areas is quite different which is completely in contrast with rural area. Also, lack of physical activity, eating junk food etc. may lead physiological and psychological symptoms *i.e.*, food craving, abdominal cramps, dizziness, irritability, mood swings insomnia of premenstrual syndrome. Headache, abdominal cramping, nausea, joint pains are the specific reasons for the onset of mood swings which are psychological factors associated with physical symptoms.

Conclusion

Pre-menstrual syndrome is one of the difficult stages which every female experience in their late luteal phase of menstrual cycle. In conclusion, it can be said that during the late luteal phase of the menstrual cycle, females of reproductive age experience headache, bloating, uterine cramps, disturbed sleep schedule, hunger pangs, abdominal pain etc. physical symptoms along with psychological symptoms along with behavioral symptoms like anxiety, restlessness, increased stress level etc. In the study conducted between the categories, 16-17 and 18-19 years, respondents of age category between 16-17 years reported that they have experienced a high level of symptoms associated with pre-menstrual syndrome. And also, urban area participants have high pre-menstrual syndrome than rural area participants. Intermediate students have high pre-menstrual syndrome than graduates.

Limitation of the Study

The study is limited to teenage girls in Visakhapatnam district.

Recommendations

Each and every school and college must provide proper awareness regarding menstruation. The government has to give priority to trained psychologist to improve the self-esteem, psychological well-being so as to reduce the severity of pre-menstrual syndrome. The government required to give more attention in psychology department to facilitate proper service in society and to remove stereotypes followed especially in rural areas regarding menstruation and personal hygiene. The government should establish counseling centers in every district of India so as to enable the public to interact with psychologist and solve their psycho social problems.

Medications

Lifestyle modifications: Include avoiding stressful events, and maintaining healthy sleeping habits, especially during the premenstrual period. Increased intake of complex carbohydrates increases the level of tryptophan, a serotonin precursor.

Cognitive Behavioural Therapy (CBT): It is an approach that emphasizes the correction of unsettled disruptive thoughts, behaviours, and emotions. CBT helps in the recognition of these behaviours and helps develop coping strategies to improve daily functioning. The fruit extract *Vitex agnus-cactus* is the only herbal medicine that is proven to control PMS-associated mood swings and irritability.

Recent studies of combined oral contraceptives comprising 0.02 mg of ethinyl estradiol and 3 mg of drospirenone (compound hormone pills for 24 days followed by hormone-inactive pills for the last four days) have demonstrated an improvement in PMDD symptoms.

Exercise: Engaging in about 30 minutes of cardio exercises such as brisk walking, jogging, running or swimming, at least 5 days every week can help in managing symptoms such as fatigue and prevent mood swings by generally elevating your mood. Apart from handling PMS, regular exercise will also help in improving your overall health.

Making dietary changes: Several dietary changes are known to provide PMS relief such as eating smaller meals frequently and a reduction in salt intake can ease bloating and fluid retention. Eating a balanced diet that includes healthy foods such as whole grains, green leafy vegetables, fresh fruits, and bowls of salad can benefit you by not only relieving the symptoms of PMS but also helping you maintain a healthy weight. Incorporate calcium rich foods such as dairy, plenty of nuts and green leafy vegetables to your diet. If you are lactose intolerant or are allergic to nuts, try adding a calcium supplement to your routine. Managing stress-getting adequate sleep by regularizing your sleep schedule can help in managing stress. Practicing deep relaxation techniques such as yoga, deep breathing etc., can also help in alleviating insomnia and stress. It is especially useful for women who experience severe migraine headaches.

Avoid smoking: Several studies have shown that women who smoke cigarettes reported that they experienced worse, more severe PMS symptoms than women who avoid smoking altogether.

Incorporating health supplements: Supplements such as such as iron, folic acid, vitamin B-6, vitamin D and magnesium can help in managing cramps and reducing mood swings.

Avoid alcohol and caffeine: Reducing your alcohol and caffeine intake can also help in managing your PMS symptoms effectively.

Conflict of Interest

No.

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