

# Is Paid Period Leave Justified in Working Women: A Crosssectional Study

Amita Verma<sup>1</sup>, Archana Kadam<sup>2</sup>

<sup>1</sup>Assistant Professor, <sup>2</sup>Associate Professor, Dept. of Physiology, Dr. D.Y. Patil Medical College, Navi Mumbai

## Abstract

Premenstrual syndrome is a set of physical, behavioural or emotional symptoms that some women experience on regular basis in relation to menstruation. Premenstrual symptoms have been associated with perceived stress, and perceived stress is the strongest predictor of premenstrual syndrome. The present study attempted to find a relationship between various cardiovascular and neurological parameters and stress in working and non working women. The study observed significant changes between the pulse and blood pressure and reaction time in the study population, while observing higher perceived stress in the working women.

**Keywords:** Reaction Time, Stress, Working Women.

## Introduction

Premenstrual syndrome (PMS) is a major clinical entity affecting a large segment of female population. It is the name given to a group of physical and emotional symptoms that some women experience on regular basis in relation to menstruation. The symptoms occur monthly generally within 7 to 14 days prior to menstruation. Symptoms may seem to worsen as menstruation approaches and subside at the onset or after several days of menstruation<sup>1</sup>. PMS leads to substantial impairment in normal daily activities and occupational productivity and significantly increased work absenteeism<sup>2</sup>. As working women are under immense physical and psychological pressures, there is a possibility that various effects of PMS may be more common in working women as compared to housewives. Certain behavioral and neurological symptoms occur in women especially during premenstrual phase. Headache, painful enlargement of breast, decreased ability to concentrate, nervous irritability, emotional instability, poor judgment, depression, tension, weight gain, and increased blood pressure have been reported during premenstrual phase, and are associated with salt and water retention.<sup>3</sup>

Another important aspect in working women is reaction time, which is crucial for our everyday lives and requires intact sensory skills, cognitive processing, and motor performance. Reaction time measurement is an indirect index of processing capability of the central nervous system and simple means of determining sensory motor association and performance of an individual.<sup>4</sup> <sup>5</sup> Studies have reported that during PMS, a variety of physiological processes are affected that includes the cardiovascular, neurological as well as psychological systems.<sup>5</sup> The present study was conducted to determine whether any difference in the above is observed in females who are working and those who are housewives during PMS and in Postmenstrual stage.

**Methodology:** The study was conducted among females in the age group of 25-40 years, living in Navi Mumbai, Maharashtra. The sample size was 30 subjects each from working women group and housewives. The working women group included subjects employed in Dr D Y Patil Medical College, Navi Mumbai, with an average workload of 40 hours per week in mild to moderate exertion level activity. while non working women group included spouses of employees at same institution.

## Inclusion Criteriae:

- Apparently healthy female subjects.
- Aged between 25 and 40 years.
- Working Group comprised females working for atleast one year.

---

## Corresponding Author:

**Archana Kadam**

Associate Professor, Dept. of Physiology,  
Dr. D.Y. Patil Medical College, Navi Mumbai  
e-mail: drarchanashirsath24@gmail.com

- Non Working group comprised females NOT working in any position for atleast one year.

#### Exclusion Criteriae:

- Subjects with menstrual disorders,
- pregnancy,
- using oral contraceptives
- with skeletal muscle diseases (i.e., Myasthenia gravis, periodic paralysis, and polymyositis)
- or having neural diseases (i.e., poliomyelitis and polyneuropathy)
- Subjects with abnormalities in visual and auditory tests were also excluded from the study.

All subjects were checked for acuity of vision by Snellen's test; color perception by Ishihara's chart; normal auditory function by Rinne's test and Weber's test. Detailed menstrual history was elicited from all subjects and premenstrual and Postmenstrual phase was determined. Premenstrual phase was taken as 1 to 7 days prior to the onset of menstruation. Their pulse rate (per minute), blood pressure (mm Hg), weight (kg), and auditory reaction time (ART) and visual reaction time (VRT) (seconds) were measured during both the phases. Before measuring ART and VRT each subject was made familiar with the apparatus. All the subjects were right handed and used their right hand to press the switch immediately after receiving visual or auditory stimulus<sup>6</sup>. Three readings for each stimulus were noted after giving three practical trials and the lowest was taken as the reaction time. All subjects were given a perceived stress questionnaire (PSQ), and asked to fill it. The Perceived Stress Scale is a 10-item self-report questionnaire that measures the persons' evaluation of the stressfulness of the situations in the past one month of their lives<sup>7</sup>. The

PSS is the only empirically established index of general stress appraisal. The subjects who scored  $\leq 20$  on the PSS were categorized to have low stress levels, while subjects with score  $>20$  were categorized to have high stress.

Written informed consent was obtained from the subjects before inclusion in the study. The data was collected in MS Excel Worksheet and analyzed using SPSS Software (ver. 16).

**Observation:** The present cross sectional study was conducted at Dept of Physiology, Dr D Y Patil Medical College, Navi Mumbai, Maharashtra, having a total of 60 adult female subjects, divided in two groups of 30 each based on whether they are working or not. The average age was  $31 \pm 2.44$  years. The average weight of the subjects was  $56.55 \pm 4.56$  kgs. The mean BMI was 25.2 among the subject group. No statistically significant differences were observed in between the two groups with respect to age, BMI and weight. (table 01)

**Table 1: Comparison of anthropometric parameters in both groups (n=30)**

Parameter (Mean)	Working group	Non Working group
Age (Years)	32.32	30.66
Height (cms)	151.4	151.7
Weight (Kgs)	57.43	53.11
BMI	25	25.4

Pulse was recorded in both the groups and showed a statistically significant difference at 95% CI (Table 2). The mean values of pulse rates Group 2 (Non working Females) was marginally lower than that of the working group (Group 1).

**Table 2: Comparison of Cardiac parameters during premenstrual and postmenstrual phases (n=30)**

Parameter		Group 1 (Working) (Mean $\pm$ SD)	Group 2 (Non Working) (Mean $\pm$ SD)	P Value	Remark
Pulse (bpm)	Premenstrual	86.5 $\pm$ 1.1	82.8 $\pm$ 1.2	<0.0001	HS
	Postmenstrual	84.5 $\pm$ 0.9	80.5 $\pm$ 1.1	<0.0001	HS
Systolic BP (mmHg)	Premenstrual	114.2 $\pm$ 2.2	104.7 $\pm$ 2.1	<0.0001	HS
	Postmenstrual	110.6 $\pm$ 2.6	101.5 $\pm$ 1.5	<0.0001	HS
Diastolic BP (mm Hg)	Premenstrual	68.8 $\pm$ 0.9	63.9 $\pm$ 1.1	<0.001	S
	Postmenstrual	65.6 $\pm$ 1.1	63.2 $\pm$ 0.9	<0.001	S

A comparison of cardiovascular system parameters during premenstrual and postmenstrual phases revealed that during premenstrual phase there was significant increase in pulse rate ( $P < 0.001$ ) among the working

group as compared to the non working group subjects. There was also a significant rise in systolic and diastolic blood pressure among the two groups.

**Table 3: Comparison of reaction parameters during premenstrual and postmenstrual phases (n=30)**

Parameter		Group 1 (Working) (Mean±SD)	Group 2 (Non Working) (Mean±SD)	P Value	Remark
ART	Premenstrual	0.84 ± 0.040	0.89 ± 0.057	<0.001	S
	Postmenstrual	0.82 ± 0.033	0.87 ± 0.021	<0.001	S
VRT	Premenstrual	0.54 ± 0.016	0.51 ± 0.011	<0.0001	HS
	Postmenstrual	0.52 ± 0.012	0.49 ± 0.017	<0.0001	HS

When evaluating the comparison of ART and VRT during premenstrual and postmenstrual phases of both the subject groups, we found that both ART and VRT were significantly increased ( $P < 0.001$ ) during premenstrual phase as compared to those in postmenstrual phase in the working women group as compared to the non working group (Table 03). Though both these subject groups exhibited decrease in cardiovascular parameters and decrease in reaction time during the postmenstrual period, it was the working group that exhibited more changes as compared to the non working group in the study.

In terms of stress in the perceived stress questionnaire, the subjects in the working group displayed the following

**Table 4: Comparison of Stress levels in Working and Non Working Group**

Stress Score	Working (n)	Non Working (n)
< 20 (Low Stress)	11	21
>20 (High Stress)	19	9

Among the two groups, the non working group displayed 21 subjects with a low stress score, while it was the working group that had 19 subjects with a high score on the stress questionnaire. (Table 2)

### Discussion

There was a highly significant increase in pulse rate, and in both systolic and diastolic blood pressure during premenstrual phase as compared to those in postmenstrual phase. This could be explained on the basis of increased fluid and salt retention induced by ovarian steroids and higher sympathetic activity due to premenstrual stress.<sup>8</sup> The differences among the working and non working groups can be attributed to

higher sympathetic activity among the working women, as rise in blood pressure due to stress leads to increased epinephrine secretion and this rise in blood pressure is important sympatho-adrenal response to physiological stressful experience of menstruation.<sup>9</sup>

Our study observed that there was prolongation of both ART and VRT during premenstrual phase as compared to those during postmenstrual phase in both the subject groups. Retention of water and sodium due to variation in sex steroid levels during menstrual cycle might influence the process of axonal conduction time and availability of neurotransmitter at synapses in auditory pathways. Changes in either of these two processes cause conduction time to vary during menstrual cycle<sup>10</sup>. The significant difference between the two groups can be attributed to increased sympathetic activity among working women due to occupational stress and increased discomfort in work environment especially during premenstrual phases<sup>11</sup>. Gordley et al (2000) stated in their study that occupational stresses among women can contribute to an increase in resulting menstrual disorders as well as increase severity of premenstrual symptoms<sup>12</sup>. A Japanese study by Yamamoto K et al, in 1994 had highlighted that one of the many reasons for an altered neurophysiological response in working women during pre menstruation stage could be due to hypothalamic-pituitary-adrenal axis activation during stress, increased levels of corticotropin-releasing hormone and glucocorticoids or increased sympathetic activity with reduction of GABA neurotransmitter in the brain due to high levels of progesterone and thus lead to a further decrease in neuronal transmission.<sup>13</sup>

A study among Japanese college students stated that the ones who reported premenstrual symptoms, menstrual pain, and the experience of irregular menstrual cycles

had higher stress scores than those who did not. The results suggest that psychosocial stress is independently associated with premenstrual symptoms and the experience of irregular menstrual cycles among college students<sup>14</sup>. Similarly a study by Nagma S et al, among medical students in India showed that the students with high stress levels (PSS >20) experienced irregular cycles more often than the ones with low stress levels (PSS ≤20).<sup>15</sup> Our study is in concurrence with both the above studies in observing that there is a definitive evidence of increased stress among the working group of subjects during their premenstrual phase and is documentable in various parameters.

### Conclusion

Our study concludes that there is a significant increase in pulse rate, blood pressure auditory reaction time and visual reaction time among the working group women during premenstrual period as compared to non working women. There is also a higher level of perceived stress among the working group. Premenstrual stress also affects the sympathetic system among both the groups but more effects were observed in working women as compared to non working women in our study. The limiting factor in our study was the small sample size and lack of diversity in choosing subjects. The lacunae of this study may be filled by further studies employing a larger and wider sample size. Finally we conclude that though a number of nations such as Japan, Taiwan, Indonesia and South Korea have provisions for paid menstrual leave, there have been cases of developed countries where such provisions have been met with severe criticism and disparity<sup>16</sup>. We end with a question of whether India should follow suit and provide such measures or continue with its draconian policies?

**Ethical Clearance:** Obtained from Institutional Ethical Committee

**Conflict of Interest:** Nil

**Source of Funding:** Self Funded

### References

1. Thomas B, Mathew B, Sharon B et al. Premenstrual syndrome. University of Pennsylvania health system 1997: 1-2.
2. Dean BB, Borenstein J E. A prospective assessment investigating the relationship between work productivity and impairment with premenstrual syndrome. J Occup Environment Med 2004; 46:649-56. [1]
3. Babyminakshi PL, Mangala KA, Afroz S, Nanda S, Sudhir P. Effect of premenstrual stress on cardiovascular system and central nervous system. J Obstet Gynecol. 2006; 56:156-8.
4. Bamne SN, Bamne AS. Effect of premenstrual stress on reaction time of 18-20 years age group. Natl J Physiol Pharm Pharmacol 2017; 7 (7):737-739.
5. Das S, Gandhi A, Mondal S. Effect of premenstrual stress on audiovisual reaction time and audiogram. Indian J Physiol Pharmacol. 1997; 41 (1):67-70.
6. Moody DB. Reaction time as an index of sensory function. In Animal psychophysics: The design and conduct of sensory experiments 1970 (pp. 277-302). Springer, Boston, MA.
7. Fliege H, Rose M, Arck P, Walter OB, Kocalevent RD, Weber C, Klapp BF. The Perceived Stress Questionnaire (PSQ) reconsidered: validation and reference values from different clinical and healthy adult samples. Psychosomatic medicine. 2005 Jan 1; 67 (1):78-88.
8. Rode MV, Kamble P, Phatak MS, Jadhao P, Tayde P. Effect of premenstrual stress on autonomic function. Annals of neurosciences. 2010 Jul; 17 (3):131.
9. Freyschuss UL, Hjemdahl PA, Juhlin-Dannfelt AN, Linde BI. Cardiovascular and sympathoadrenal responses to mental stress: influence of beta-blockade. American Journal of Physiology-Heart and Circulatory Physiology. 1988 Dec 1; 255 (6):H1443-51.
10. Mehta V, Chakrabarty AS. Autonomic functions during different phases of menstrual cycle. Indian journal of physiology and pharmacology. 1993 Jan; 37 (1):56-8.
11. Girija B, Veeraiah SH. Effect of different phases of menstrual cycle on physical working capacity in Indian population. Indian J Physiol Pharmacol. 2011; 55 (2):165-9.
12. Gordley LB, Lemasters G, Simpson SR, Yiin JH. Menstrual disorders and occupational, stress, and racial factors among military personnel. Journal of occupational and environmental medicine. 2000 Sep 1; 42 (9):871-81.
13. Figatalamanca, I. and Hatch, M. C., 1994. Reproduction and the workplace-what we know

and where we go from here. *International Journal of Occupational Medicine and Toxicology*, 3 (3), pp. 279-303.

14. Yamamoto K, Okazaki A, Sakamoto Y, Funatsu M. The relationship between premenstrual symptoms, menstrual pain, irregular menstrual cycles, and psychosocial stress among Japanese college students. *Journal of Physiological Anthropology*. 2009 May 31; 28 (3):129-36.
15. Nagma S, Kapoor G, Bharti R, Batra A, Batra A, Aggarwal A, Sablok A. To evaluate the effect of perceived stress on menstrual function. *Journal of clinical and diagnostic research: JCDR*. 2015 Mar; 9 (3):QC01.
16. Przybylo E, Fahs B. Feels and Flows: On the Realness of Menstrual Pain and Crippling Menstrual Chronicity. *Feminist Formations*. 2018; 30 (1):206-29.