

# Psychophysical Characteristics of the Premenstrual Period

Ana Staničić<sup>1</sup> and Nataša Jokić-Begić<sup>2</sup>

<sup>1</sup> Center for Clinical Psychology, Zagreb, Croatia

<sup>2</sup> University of Zagreb, Department of Psychology, Faculty of Humanities and Social Sciences, Zagreb, Croatia

## ABSTRACT

*Aim of this study was to investigate psychophysical characteristics of the premenstrual period in regard to the period following menstruation. Psychophysical characteristics are defined as assessments of the physical state (fatigue, breast tenderness, bloating and lack of sleep), emotional state (happiness, anger, sadness, irritability, anxiety and distraction) and general assessments of physical attractiveness and satisfaction with oneself. Diary of psychophysical characteristics was designed for this study as well as a socio-demographic questionnaire and a menstrual cycle calendar. 51 healthy, non-help-seeking women, aged 21–46 kept a diary of psychophysical characteristics a week before menstruation and four days one week after the onset of menstruation, during two menstrual cycles. The premenstrual period is characterized by the intensification of negative emotional states, the decline of positive emotional states, and the worsening of the general self-image through the decline of the perception of physical attractiveness and satisfaction with oneself. In conclusion, the premenstrual period is not marked only by the mood-swings but also by the changes in the cognitive representation of self.*

**Key words:** premenstrual period, diary method, self-image

## Introduction

A wide definition of premenstrual syndrome (PMS) involves negative emotional, behavioural, and physical symptoms present during the luteal phase of the menstrual cycle (from ovulation to menstruation) but not the follicular phase (post menstruation to ovulation)<sup>1</sup>. More than 100 physical and psychological symptoms have been reported to occur premenstrual<sup>2</sup>. The most common emotional symptoms include irritability, moodiness, hostility, and depressed mood; physical symptoms include breast pain, bloating, fatigue, abdominal pain or cramping, and headaches<sup>1</sup>. Epidemiological surveys have estimated that as many as 75% of women of reproductive age experience some symptoms attributed to the premenstrual phase of the menstrual cycle<sup>2,3</sup>.

More than 65 instruments have been developed to diagnose PMS, with wide differences in content, administration, and degree of impairment required to constitute a diagnosis. To date, most studies that have evaluated prevalence of premenstrual symptoms have not used prospective daily diaries but rather retrospective measures relying on participants' memory. However, many studies

have shown that retrospective ratings give overly strong indications of cyclicity and may be biased in other ways<sup>4</sup>. Some researchers found a recall bias on retrospective symptoms reports in their studies<sup>5</sup>.

Majority of studies focus only on feelings of negative affect, neglecting to assess feelings of happiness, satisfaction or others of positive affect. By focusing only on negative aspects of menstruation, researchers are creating likely response biases<sup>1</sup>. In one study<sup>6</sup> which included positive mood variables a cycle pattern of mood and physical state was found, with a peak of well-being and other positive feelings in the postmenstrual period (mid- or late follicular phase of the menstrual cycle) and a decline in the premenstrual phase. Peak value of negative feelings (depression, tension, fatigue, irritability, breast tenderness and swelling) was in the premenstrual (i.e., late luteal) phase. We wanted to approach the study of the premenstrual period by gathering data prospectively and by investigating not only negative feelings, but also those of positive affect.

We were interested to find if the changes that occur in the premenstrual period will have an effect on the self image of women. Self image of women during this period is an interesting study subject, understanding of which would help unravel the changes in the cognitive representation of self. Sense of self is a complex mental scheme of self which refers to very different aspects of people: from appearance (body image), and awareness of their own abilities and aspects of personality to very specific aspects such as the ability to carry out tasks within the given deadline, or competence to perform some vital tasks<sup>7</sup>. Studies have shown that the activation of the scheme of self inevitably leads to self-assessment<sup>8</sup>. A process that began by targeting attention to oneself leads to a re-examination and comparison of the activated schemes of self with the standard<sup>8</sup>. As part of our concept of self, there are two types of »potential self«: I as I would wish to be and I as I should be. In a culture which reveres beauty, but also competence, there are two components of the image of self that may be compromised by bodily changes characteristic for the premenstrual period. Bloating, lack of sleep, fatigue and breast tenderness can focus one's attention to their physical appearance. Therefore, during the premenstrual period a physical scheme can be triggered, which when compared with the standard can be assessed negatively. Distraction, anxiety and irritability can trigger cognitive and emotional competencies scheme, which may also be compromised in the premenstrual period.

Self-image has not yet been investigated within the menstrual cycle. Because of the particularities of the premenstrual period of the menstrual cycle, we were interested to see if the evaluation of self differs in different phases of the menstrual cycle. We presume it will have an effect on the self image of women, drawing focus on particular parts of the scheme of self and through the course of self-assessment having a negative effect on the self image. By including measures of satisfaction with oneself and feeling of physical attractiveness in our study we tried to address this issue.

## Materials and Methods

### Measures

#### Socio-demographic Questionnaire

The Socio-demographic questionnaire was constructed for this study. It obtained data of participants age, work place, education, psychological and physical problems, sexual activity, use of contraceptives, use of PMS medication, thyroid problems, number of pregnancies and child birth, stress level and duration of the menstrual cycle. They were also asked to assess their difficulties in the premenstrual period, if any existed (1 – I have neither physical nor psychological problems of PMS; 2 – I have PMS from time to time, but it doesn't pose a problem; 3 – I have only physical problems in the premenstrual period; 4 – I have only psychological problems in the premenstrual period; 5 – I have PMS every month, and it's a big problem).

#### Diary of psychophysical characteristics

Diary of psychophysical characteristics was designed for this study with intent to record subjective intensities of symptoms by the participants themselves. The diary consisted of two parts: the First part of the diary was to be completed in the premenstrual period (7 days before menstruation) and the Second part of the diary was to be completed in the postmenstrual period (7 days after the onset of menstruation, i.e. 8<sup>th</sup> – 11<sup>th</sup> day of the menstrual cycle). Because of the inability to accurately predict the onset of menstruation, participants started to fill out the first part of their diaries 7 days before the approximated onset of menstruation and stopped the first day of menstruation. Measures collected in four days before the onset of menstruation were analyzed. Seven days after the onset of menstruation participants completed the second part of the diary for four days. Apart from the length of completing, the two parts of the diary did not differ. On a 5-point Likert scale (1 – I don't feel like that at all, 5 – I feel like that, markedly) participants had to rate how they felt in the last half hour. Feelings of happiness, anger, sadness, irritability, anxiety and distraction were assessed. Participants filled in their assessments three times a day – in the morning (30 minutes after waking up), afternoon and evening (30 minutes before sleep). Only in the afternoon they were also asked to assess their physical state (fatigue, breast tenderness, bloating and lack of sleep) and to assess how physically attractive they felt. In the evening they also assessed how satisfied they were with themselves for that day, and also how stressful that day was for them. The design of the diary entailed a section where participants could record any event or thought, if they thought it influenced their current state. Before the beginning of this study, a preliminary version of the Diary of psychophysical characteristics was constructed and administered on a sample of 10 women for four days. In mind of comments of these participants the Diary was somewhat modified for this study.

### Participants

The study was conducted on a convenient sample of 60 women, however 9 women were excluded from further analyses due to incorrectly kept or missing diaries; therefore data from 51 women was analyzed. Participants were healthy women of Caucasian origin recruited through snowball sampling. They had a regular menstrual cycle and no thyroid problems. The mean age of participants was 26.7 (standard deviation [SD], 7) years. With respect to education level, 33 participants were college students, 15 had college degrees, and 3 completed high school. 43 participants reported being in good health, while 8 reported having allergies and/or asthma. There were 2 participants who had one pregnancy and one child, 4 had two or more pregnancies and two children, whereas 45 were never pregnant. While only 11 participants reported their stress level as low, majority of participants rated their life as somewhat stressful (n=25), stressful (n=14) or extremely stressful (n=1).

The severity of premenstrual problems were assessed retrospectively at the beginning of the study, participants were asked to rate their premenstrual hardships. 34 participants declare they had occasional symptoms causing no discomfort. 5 participants say they had only physical problems in the premenstrual period, while 4 participants report having only psychological problems in the premenstrual period. Only one participant had no psychological or physical symptoms, 7 participants reported having premenstrual symptoms that significantly interfered with their daily functioning.

*Procedure*

The study was performed in two parts, from May to July 2006. In the first part of the study participants completed the Socio-demographic questionnaire. Although in some cases the questionnaire was administered in a group setting, they mostly received individual instructions. After completing the questionnaire the approximate date of the beginning of menstruation was calculated for each participant and detailed instructions on keeping the diaries were given.

The second part of the study consisted of keeping the Diary of psychophysical characteristics for two consecutive menstrual cycles. Participants were given detailed instructions on how to fill out the Diary. Instructions for completing the Diary were also included on the inside cover of the Diary binder. Participants were reminded by phone on the day when they were to start keeping the diary and record their emotional and physical states. Upon completing the premenstrual part of the Diary, participants were contacted by the researcher and the day for starting the postmenstrual part of the Diary was calculated. The participants were again reminded by phone when to start keeping the postmenstrual part of the Diary. They returned their completed diaries by mail, using pre-addressed, stamped envelopes.

The study was carried out in accordance with the latest version of the Declaration of Helsinki and approved by the Scientific and Research Ethics Committee of the Department of Psychology, Faculty of Humanities and Social Sciences, University of Zagreb, Zagreb, Croatia. All participants received a thorough explanation of the study and gave their informed consent before entering the study.

**Results**

The Statistical Package for the Social Sciences, version 12.0 (SPSS Inc., Chicago, IL, USA) was employed in the computer analyses of the data received from 51 women. The level of statistical significance was set at  $p < 0.05$ .

*Diary of psychophysical characteristics*

Data collected over four days before menstruation and four days of the postmenstrual period, for two menstrual cycles, were analyzed. A series of t-tests were ad-

ministered to determine if variables from the first menstrual cycle differed significantly from their counterpart in the second menstrual cycle. Upon finding that these two menstrual cycles did not differ we formed new variables by calculating the mean value of the two cycles for each variable. General linear model (repeated measures) was used to analyze the data. GLM repeated measures is a procedure used to model dependent variables measured at multiple times using analysis of variance. Each dependent variable is represented by as many variables as there are measurement times (e.g. Happiness measured 1<sup>st</sup> day of the premenstrual period in the afternoon, Happiness measured 2<sup>nd</sup> day of the premenstrual period in the afternoon, ect.) for n time periods. Predictor variables may be categorical factors or continuous covariates.

Results of the analyses have shown that, in the premenstrual period in regard to the period after menstruation, women reported higher intensities of sadness ( $F = 5.963, p = 0.018$ ), higher intensities of anxiety ( $F = 4.922, p = 0.031$ ), higher intensities of irritability ( $F = 15.865, p < 0.01$ ), higher intensities of distraction ( $F = 9.107, p = 0.004$ ). Women felt more bloated ( $F = 41.142, p < 0.01$ ) and reported more breast tenderness ( $F = 81.166, p < 0.01$ ) in the premenstrual period. Measures of fatigue ( $F = 0.247, p = 0.62$ ), sleep deprivation ( $F = 3.645, p = 0.062$ ) and anger ( $F = 3.686, p = 0.061$ ) were not significantly different in the two periods measured.

Participants significantly differed in the measures of happiness, feeling of attractiveness and satisfaction with oneself in regard to the two periods measured. They felt less happy ( $F = 12.323, p < 0.01$ ) in the premenstrual period when compared to the postmenstrual period. Satisfaction with oneself was lower ( $F = 6.922, p = 0.012$ ) in the premenstrual period, as was the feeling of physical attractiveness ( $F = 19.279, p < 0.01$ ). We found no difference in the level of stress experienced in these two periods ( $F = 2.260, p = 0.139$ ).

**Discussion**

Majority of our sample retrospectively assessed their premenstrual symptoms as occasional and not posing a problem. When measured prospectively we found that

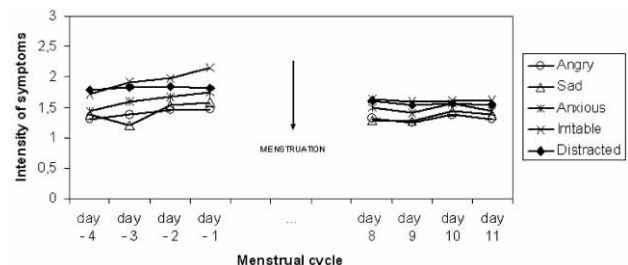


Fig. 1. Mean values of intensities of anger, sadness, anxiety, irritability and distraction in the premenstrual period (4 days before menstruation) and in the postmenstrual period (7 days after the onset of menstruation, i.e. 8<sup>th</sup> – 11<sup>th</sup> day of the menstrual cycle) measured in the afternoon.

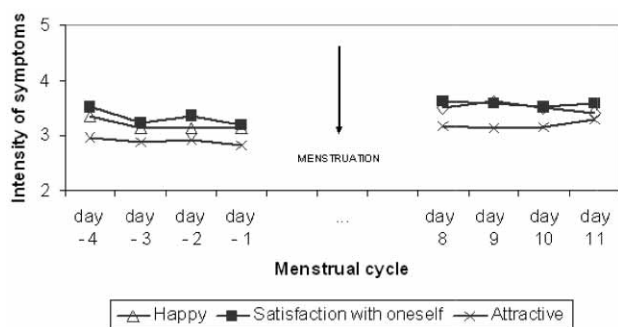


Fig. 2. Mean values of intensities of happiness, satisfaction with oneself and attractiveness in the premenstrual period (4 days before menstruation) and in the postmenstrual period (7 days after the onset of menstruation, i.e. 8<sup>th</sup> – 11<sup>th</sup> day of the menstrual cycle) measured in the afternoon.

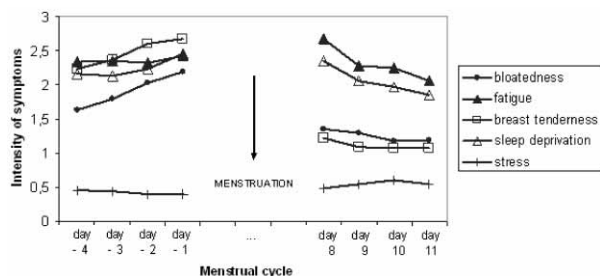


Fig. 3. Mean values of intensities of bloatedness, fatigue, breast tenderness and sleep deprivation (measured in the afternoon) and the level of stress, in the premenstrual period (4 days before menstruation) and in the postmenstrual period (7 days after the onset of menstruation, i.e. 8<sup>th</sup> – 11<sup>th</sup> day of the menstrual cycle).

our participants differed in the premenstrual and postmenstrual period. Results have shown that they felt sadder, more anxious, more irritable and more distracted in the premenstrual period in regard to the postmenstrual period. They felt more bloated and felt more breast tenderness in the premenstrual period. And they felt less happy, physically attractive and satisfied with oneself in the premenstrual period than in the postmenstrual period. These results are in accord with similar studies in this field<sup>6-8</sup>. However, although statistically significant, the differences in value are small on the five degree scale we used. Robustness of the scale, as well as the fact that this research was conducted on a non-clinical sample of women, likely had an influence on the size differences. Although the differences are small, they show regularity, even with women who don't perceive this problem as specifically disturbing.

We emphasize the results of positive affect variables, as they are so rarely addressed in other studies of the menstrual cycle. Satisfaction with oneself and feeling of physical attractiveness, were included in the study to shed light on the self image of women during these periods. We assumed that the physical and emotional changes that occur during the premenstrual period will also manifest through negative evaluations of their physical attractiveness and satisfaction with themselves.

Satisfaction with oneself, assessed at the end of each day and presenting a generalized measure of satisfaction, was lower in the premenstrual period with its lowest value on the day before menstruation. Feeling of physical attractiveness was lower in the premenstrual period, also reaching its lowest point on the day before menstruation.

A person is not aware of »everything« about themselves in every situation<sup>9</sup>. Dependent of the stimuli, parts of the scheme of self which are associated with the characteristics of the situation will be activated<sup>10</sup>. If the situation does not have a distinctive character, parts of the scheme of self that are linked to what the person is thinking, will be activated. There are many facets of self, including awareness of one's own body, or cognitive and emotional abilities which are unified into a coherent sense of self<sup>9</sup>. Physical changes throughout the menstrual cycle can activate the body-image scheme, while emotional changes can trigger the cognitive and emotional competencies scheme. The re-examination and comparison of this activated scheme to the standard can have a negative effect on the feeling of self-satisfaction and self-image.

Only a few studies investigated self-perceived attractiveness during the menstrual cycle. One study found no cyclic changes in self-perceived attractiveness<sup>11</sup>, but authors suggested further study. Results of our research show a lower intensity of the feeling of physical attractiveness in the premenstrual period. The feeling of attractiveness is complex and, in our »beauty obsessed culture«, it's quite sensitive. The feeling of attractiveness and idealized representations of women in the media has been studied by various researchers. Results suggest a connection between the idealized portrayal of women and a lower feeling of attractiveness in women<sup>12</sup>. The study exploring how women assessed the attractiveness of other women<sup>13</sup> found that women in the premenstrual phase assessed the attractiveness of other women lower than did women in other phases of the menstrual cycle.

We should address some limitations of this study. Our sample is homogenous by education, and as some studies have shown symptoms of PMS have shown to be more intensified in women of a higher educational level<sup>14</sup>. The design of the Diary of psychophysical characteristics was such that made aware the current period of the menstrual cycle that the participant was in. This problem could be alleviated by having the participants note the Diary throughout the whole menstrual cycle. Our study lacks a satisfactory indicator of different stages of the hormonal cycle. Direct measurement of hormones would ensure that the approximated period of the menstrual cycle is correct. Possible restriction of this research comes from the fact that data from the same participants were added (for two periods). This may cause the number of some data to increase while the standard deviation (SD) might decrease and it might have some influence on significance of differences. Future researchers are advised to address this problem by analyzing the periods separately to alleviate the possible influence of the aforementioned analysis.

In conclusion, our study showed that the premenstrual period is characterized by the intensification of negative emotional states, the decline of positive emotional states, and the worsening of the general self-image through the decline of the perception of physical

attractiveness and satisfaction with oneself. The premenstrual period is not marked only by the mood-swings but also by the changes in the cognitive representation of self.

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A. Staničić

Center for Clinical Psychology, Slovenska 13, 10000 Zagreb, Croatia  
e-mail: ana.stanicic@gmail.com

## PSIHOFIZIČKE KARAKTERISTIKE PREDMENSTRUALNOG PERIODA

### SAŽETAK

Cilj provedenog istraživanja bio je ispitati postoje li psihofizičke osobitosti predmenstrualnog razdoblja u usporedbi s razdobljem nakon menstruacije. Psihofizičke osobitosti operacionalizirane su kao procjena tjelesnih stanja (umor, osjetljivost grudi, naotečenost, neispavanost), emocionalnih doživljaja (sreće, ljutnje, tuge, razdražljivosti, tjeskobe i rastresenosti), te općenite procjene tjelesne privlačnosti i zadovoljstva samom sobom. Za potrebe istraživanja konstruiran je dnevnik za praćenje psihofizičkih simptoma vezanih uz PMS te upitnik za ispitivanje socio-demografskih varijabli i praćenje menstrualnog ciklusa ispitanica. 51 zdrava žena, između 21–46 godina starosti, je vodila dnevnik simptoma tjedan dana prije menstruacije i četiri dana tjedan dana nakon menstruacije, kroz dva menstrualna ciklusa. U predmenstrualnom razdoblju se javlja intenziviranje negativnih emocionalnih stanja, opadanje pozitivnih emocionalnih stanja, te pogoršavanje opće slike o sebi kroz opadanje osjećaja tjelesne privlačnosti i zadovoljstva sa samom sobom. Zaključno, u predmenstrualnom razdoblju ne dolazi samo do promjena u raspoloženju već i do promjene u kognitivnoj reprezentaciji sebe.