HEALTH PSYCHOLOGY | RESEARCH ARTICLE

The relationship between personality characteristics and premenstrual syndrome in female students

Fateme Dehghan1*, Marzieh Kaboudi1 and Nasrin Rezaie Khosravi2

Abstract: The relationship between personality characteristics and premenstrual syndrome has been considered by the researchers for a long time. The purpose of the present study was to determine the relationship between personality characteristics based on Hexaco six-factor model with symptoms of premenstrual syndrome. Methods: This is a descriptive-analytic study. The statistical population consisted of female students in Kermanshah Medical Sciences University in the academic year 2017–2018. In a random sampling method based on the G-power software 220 ones were selected. The participants responded to Hexaco personality characteristics and premenstrual syndrome questionnaires. The correlation and multivariate regression tests were used for data analysis through SPSS-23 software. There was a significant relationship between personality characteristics of honesty-humility (0.32) and openness experience (0.23) with premenstrual syndrome (p < 0.01). Personality characteristic of honesty-humility (0.37) and agreeableness (~−0.14) were predictive of premenstrual syndrome. The results of this study showed that personality factors can be considered as one of the predictors of premenstrual syndrome.

Subjects: Health; Midwifery; Sexual Health Education

Keywords: premenstrual syndrome; personality; female students; HEXACO

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PUBLIC INTEREST STATEMENT

One of the psychosomatic issues of the reproduction function in women is premenstrual syndrome (PMS). Women with PMS face mental, neural, and glandular disorder. It affects considerably one’s ability to work and perform daily tasks. This feasibility study aimed to determine the relationship between personality characteristics based on Hexaco six-factor model with symptoms of premenstrual syndrome. The results of this study showed that personality may be associated with premenstrual syndrome and personality factors can be considered as one of the predictors of premenstrual syndrome. It is important that more studies be conducted on PMS. Therefore, suitable treatment options based on basic personality traits need to be considered.

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1. Introduction

Premenstrual syndrome (PMS) is a collection of women's physical and mental symptoms of menstruation (Babazadeh & Keramat, 2011). This disorder is a psychosomatic medicine. The basic hypothesis of the psychosomatic model is that if the organism is under stress, it may cause pathogenic conditions in a part of the body (Balaha et al., 2010).

This disorder should be distinguished from premenstrual dysfunction, which is common in women and today is considered as a component of depression disorders (Novak, 2007). In the domain of psychological diseases, the more severe type of syndrome is called prenatal distress disorder (Rizk et al., 2006). Most women experience some physical and psychological changes from a few days to two weeks before the onset of a menstruation, which is called premenstrual syndrome. This syndrome involves a series of symptoms including depressed mood, panic, change in sleep pattern, memory disorders, irritability, and early suffering, anxiety, weight gain, and appetite changes (Lobbestael et al., 2011). The severity of the symptoms is sometimes to the extent that during the last week of the ovarian phase, the menstrual cycle causes problem in women's function and it is repeated every month (Arbabi et al., 2008). These symptoms occur during the luteal phase of the menstrual cycle and improve with the onset of menstruation or at the first few days (Hanifi et al., 2011). More than 90% of the women in reproductive age report mild premenstrual symptoms and at least one of these symptoms is repeated each month. Two to 10% of them experience such severity of the symptoms that it affects family status, social activity, and job opportunities (Shabanian et al., 2011). The cause of this disorder is still unclear. In an effort to clarify the etiology of this syndrome, some researchers have addressed psychological causes (Taylor, 2005). In many women, personality and environmental factors have been considered for effective response to premenstrual syndrome. If we consider a person's personality as a common factor in which the experiences of each woman's personal life should be examined by that, a review of specific characteristics of a person may help to better interpret the oscillations of this syndrome (Foresti et al., 1982).

Personality is a certain pattern of behavior and thought methods that defines how to adapt to the environment (Axelsson et al., 2014) and it allows us to predict what the person will do in a given position (John & Srivastava, 1999). Various studies have looked at personality traits and PMS, but how this relationship is still ambiguous. Erenoğlu and Sözbir (2020) study relationship of experiencing premenstrual syndrome (PMS) and dysmenorrhea with the personality structure of women, these data suggest that women who are introverted, have weak self-confidence, tend to have negative feelings such as anxiety, depression, and anger, and have weak coping skills at risk for experiencing PMS. Mira et al. (1985) reported that in subjects with PMS, significant scores were found in the anxiety trait questionnaire in both luteal and follicular phases. Also, there was a significant difference in the level of general health as well as in the neuroticism aspect of the Eysenck Personality Scale. The results of the research that describe the relationship between PMS and personality dimensions are contradictory to each other (Telek et al., 2010). Some studies have shown that the psychological state of individuals may affect the threshold of pain and the characteristics of individuals in providing physiological responses and emotional responses are two important factors in this issue (Akaberian et al., 2013). In Shahbazi et al. (2017) study “the relationship between premenstrual syndrome and personality characteristics in married women in Rasht city,” the results showed that women with symptoms of premenstrual syndrome in psychosocial and agreement indices significantly got higher score rather than the women without symptoms of premenstrual syndrome. At the same time, the study done by Telek et al. (2010) titled “explaining the role of personality dimensions of individuals in their premenstrual syndrome,” showed that women with a severe type of premenstrual syndrome had a high score in positive attributes such as self-efficacy. Telek et al. (2010), with comparing the experience of severity of discomfort and psychological and physical symptoms at the late of the luteal phase, concluded that women with premenstrual syndrome significantly got high scores in the nervous system or the index of emotional instability and lower scores in conscientiousness trait. Akaberian et al. (2013) reported that the severity of premenstrual syndrome varies in two personality types A and B. In addition, it has
been reported that women with severe premenstrual syndrome show a higher incidence of personality disorders and most people with premenstrual syndrome are likely to get dramatic personality disorder, obsessive-compulsive personality, anxiety, and panic (Sassoon et al., 2011). In addition, there is a need for further studies because of the contradiction in the results of studies, and since women play a very important role in the family and society, the researchers must examine and address the factors that prevent proper performance of their duties and their roles in the family. This is especially important in female students studying at high educational levels and will have to bear heavy social responsibilities in the future (Kaboudi et al., 2017). In this regard, due to the high prevalence and the effects of premenstrual syndrome on the performance of women and also due to the lack of scientific studies related to the personality aspects of the syndrome, the aim of this study was to determine the relationship between premenstrual syndrome and personality characteristics of female students in Kermanshah Medical Sciences University.

2. Materials and methods
The present study is a descriptive-analytic study. The statistical population of this study was female students in Kermanshah Medical Sciences University in 2017. The sample size with regard to the percentage of premenstrual syndrome in type A personality is approximately 38% and in type B is approximately 26% in the study of Akaberian et al. (2013) and considering 95% test power and the first type error 5%, 165 people were estimated using the G-power software. However, considering the probability of falling of samples, this figure was considered 220 people and the samples were selected by stratified random sampling. The present study was conducted at the Ethics Committee of Kermanshah Medical Sciences University with the code KUMS. REC.1396.294. All participants have expressed their satisfaction in writing form to participate in the research and considering the ethical dimension of the research, they were assured of the confidentiality of personal information.

Entry requirements: having an age range between 18 and 27 years old; having regular menstruation (between two cycles of 26–31 days); having normal menstrual bleeding of 3–8 days; obtain a score of 18 up from the screening tool for premenstrual syndrome (moderate and severe).

Exclusion requirements: history of drug use or cigarette, history of ovarian cyst or female surgeries, history of underlying diseases affecting premenstrual syndrome (including heart disease, respiratory, kidney, hypertension, asthma, diabetes, epilepsy, migraine, thyroid, anemia, and neuropsychiatric diseases), having a history of mental illness and depression; history of taking antidepressants, sedation, and hormones; adverse events or deaths of loved ones and divorces in the last three months; the season of exams at the end of the semester.

2.1. Tools
Hexaco Personality Questionnaire: The Hexaco P.A personality questionnaire is a model of personality factor dimensions that has one hundred questions and six broad dimensions: Honesty-humility, agility, extraversion, agreeableness, conscientiousness, and openness experience. The score for this questionnaire is in Likert method, so that the range of scores is between 1 and 5. Score 1 to “totally disagree,” Score 2 to “disagree,” Score 3 to “not agree and not disagree,” Score 4 to “agree,” and Score 5 to “totally agree.” Cronbach’s alpha for the six dimensions has fluctuated in the range of 0.87 to 0.94 and for procedures from 0.71 to 0.92 (Miller et al., 2009). In the study of Lee and Ashton (2014), Cronbach’s alpha for humility (0.92), excitability (0.90), extraversion (0.92), consistency (0.89), conscientiousness (0.89), and openness experience (0.90).

Premenstrual Syndrome Questionnaire: The standard form of registering daily status for measuring the premenstrual syndrome including 18 common symptoms of syndrome (10 behavioral symptoms and 8 physical symptoms) (Shobeiri et al., 2016). The validity of this form is determined using content validity and using the opinions of the faculty members of Rafsanjan University, and its reliability coefficient is 0.89 (Shobeiri et al., 2016). Each of the symptoms is graded to four
degrees (0–3); I do not have (0), mild (1), moderate (2), and severe (3); the range of grades is from zero to 54.

Data were analyzed using SPSS-23 software in two sections: descriptive statistics (mean and standard deviation) and inferential statistics (correlation and regression).

3. Results
About 41.4% (91 people) had bachelor's degrees and 58.6% (129 ones) were graduated from medical department. About 92.7% (204 people) were single and 7.3% (16 persons) were married. 32.7% of the students were from medical faculty, 20.9% from paramedical faculty, 10% from nursing midwifery faculty, 14.1% from health faculty, 17.3% from dental faculty, and 5% from pharmacy faculty (Table 1).

The mean and standard deviation of premenstrual syndrome was 64.75 ± 107.50 and the components of personality characteristics of honesty-humility 8.15 ± 43.46, the emotionality 7.55 ± 44.89, 7.73 ± 44.28 extraversion, the agreeableness 7.28 ± 42.63, the duty 8.29 ± 47.58, and openness experience 7.68 ± 44.75, respectively (Table 2).

There was a significant relationship between personality characteristics of honesty-humility (0.32) and openness experience (−0.23) with premenstrual syndrome at level p < 0.01 (Table 3).

Personality characteristics of honesty-humility (0.37) and agreeableness (−0.14) are predictive of premenstrual syndrome (Table 4).

### Table 1. The descriptive-demographic characteristics of the population of the study

| Variable     | Variable level | Frequency | Percentage |
|--------------|----------------|-----------|------------|
| Marital status |                |           |            |
|               | Single         | 204       | 92.7       |
|               | Married        | 16        | 7.3        |
| Degree       | Bachelor degree| 91        | 41.4       |
|               | Medical        | 129       | 58.6       |
| Faculty      | Medical        | 72        | 32.7       |
|               | Paramedical    | 46        | 20.9       |
|               | Nursing—Midwifery | 22   | 10         |
|               | Health         | 31        | 14.1       |
|               | Dental         | 38        | 17.3       |
|               | Pharmacy       | 11        | 5          |

### Table 2. Mean and standard deviation of premenstrual syndrome and personality characteristics

| Variables          | Mean | Standard deviation |
|--------------------|------|--------------------|
| PMS                | 107.50 | 64.75                |
| Honesty-Humility   | 43.46 | 8.15                 |
| Emotionality       | 44.89 | 7.55                 |
| Extraversion       | 44.28 | 7.73                 |
| Agreeableness      | 42.63 | 7.28                 |
| Conscientiousness  | 47.58 | 8.29                 |
| Openness Experience| 44.75 | 7.68                 |
Table 3. Correlation coefficients between personality characteristics and premenstrual syndrome

|                   | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
|-------------------|-----|-----|-----|-----|-----|-----|-----|
| Honesty-Humility  | 1   |     |     |     |     |     |     |
| Emotionality      | 0.50** 0.001 | 1   |     |     |     |     |     |
| Extraversion      | 0.39** 0.001 | 0.35** 0.001 | 1   |     |     |     |     |
| Agreeableness     | 0.42** 0.001 | 0.29** 0.001 | 0.46** 0.001 | 1   |     |     |     |
| Conscientiousness | 0.45** 0.001 | 0.61** 0.001 | 0.58** 0.001 | 0.56** 0.001 | 1   |     |     |
| Openness Experience| 0.60** 0.001 | 0.48** 0.001 | 0.38** 0.001 | 0.51** 0.001 | 0.53** 0.001 | 1   |     |
| PMS               | 0.32** 0.001 | 0.12 0.06 | 0.01 0.989 | 0.13 0.053 | 0.10 0.141 | 0.23** 0.001 | 1   |

at the level (p < 0.01) is significant. **

Table 4. Standard and nonstandard coefficients of regression model for prediction of premenstrual syndrome

| Criterion variable | R   | R²  | F    | Predictive variable | B    | Std β | T    | p    |
|--------------------|-----|-----|------|---------------------|------|-------|------|------|
| PMS                | 0.35| 0.32| 25.08| Honesty-Humility    | 2.55 | 0.50  | 0.37 | 5.46 | 0.001|
|                    |     |     |      | Emotionality        | -0.05|       | -0.67| 0.50 |
|                    |     |     |      | Extraversion        | -1.20| 0.57  | -0.14| -2.09| 0.03 |
|                    |     |     |      | Agreeableness       | -0.06|       | -0.08| 0.93 |
|                    |     |     |      | Conscientiousness   | -0.05|       | -0.71| 0.43 |
|                    |     |     |      | Openness Experience | 0.05 |       | 0.71 | 0.47 |

4. Discussion
In this study, the relationship between personality characteristics and premenstrual syndrome was investigated. The personality characteristics of honesty-humility and extraversion have the potential to predict premenstrual syndrome in female students. These results are consistent with previous research results (Akaberian et al., 2013; Arslantaş et al., 2018; Ducasse et al., 2016; Erenolu & Sözbir, 2020; Heydarpour & Dehghan, 2019; Kaboudi et al., 2017; Mohammad Bakhshani et al., 2012). According to Hans Eisen’s theory, people with personality type A have unstable extraversion, irritable, emotional, aggressive, and restless personality characteristics and people with personality type B have an intrinsic, non-social, cautious, and silent personality characteristic and for this reason, the issues are less pronounced, and the possibility of chronic and severe complications is higher in them. Extrovert people show more symptoms due to their inability to adapt to stressful situations. This can be due to the occurrence of more PMS in these individuals (Courtet et al., 2011).

Women with PMS are likely to express more personality violence than those who do not have this syndrome. Therefore, the actions of women with PMS were more irritating and more violent. Significantly, it is found that the patterns of violence-invasive emotional disturbances in women with PMS is considered a kind of endophenotype which is vulnerable to suicidal ideation (Courtet et al., 2011).
Openness experience had a negative relationship with PMS. People with this personality characteristic may be more likely to move and benefit from the skills and behaviors learned in the previous menstrual cycle, thereby reducing the symptoms of PMS. Openness experience is associated with relieving stress. Because the conditions are evaluated in people who have a high grade in openness experience and are considered as a low-risk factor. Hence, these people will experience PMS symptoms less because of stress reduction (Doost & Yousefi, 2014).

Sassoon et al. (2011) reported that the prevalence of personality disorders among women who had PMS was 27% and, additionally, they found that women with PMS were odd-ecentric, excitable-moody and had anxiety and fears. The most common personality disorder in the PMS group was reported to be obsessive-compulsive personality disorder (18%). Women with PMS showed high levels of histrionic, obsessive-compulsive, self-defeating, and dependent personality traits during the follicular and late luteal phases and had higher scores for schizoid, schizotypal, borderline, narcissistic, and passive-aggressive personality disorder traits. Firoozjai et al. (2015) reported that the level of borderline traits among women with PMS was 29.9%. They found a positive relationship between neurotic personality, neuroticism, emotional consistency, and introversion. Additionally, they claimed that neuroticism accounted for 15% of the severity of PMS.

The results of this study are suitable for the therapeutic dimensions of premenstrual syndrome. In fact, psychological therapies based on mindfulness and experiential avoidance increase psychological flexibility (Hayes et al., 2006). Additionally, the pain management was effective and suicidal patients improved with third-wave therapy. Therefore, psychotherapy appears to be a helpful action in managing patients with PMS (Vowles et al., 2011).

5. Conclusion
In this study, the severity of premenstrual syndrome in female students was significantly correlated with their personality characteristics. The results of this study can be used in student counseling centers. In addition, the prevalence of premenstrual syndrome and its complications suggest more efforts to diagnose, prevent, and treat this disorder, according to women’s personality characteristics.

Authors’ contributions
Study design: MK and FD. Data collection: FD. Data analysis and interpretation of data: MK, FD, and NR. Drafting of the manuscript: MK and FD. Study Supervision: MK.

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Competing interest
All authors have no competing interests to declare.

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Ethics approval and consent to participate
The present study was conducted at the Ethics Committee of Kermanshah Medical Sciences University with the code KUMS.REC.1396.294.

Consent for publication
All participants have expressed their satisfaction in writing form to participate in the research and considering the ethical dimension of the research, they were assured of the confidentiality of personal information.

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HEXACO-PI-R
(SELF REPORT FORM)

DIRECTIONS

On the following pages you will find a series of statements about you. Please read each statement and decide how much you agree or disagree with that statement. Then write your response in the space next to the statement using the following scale:

5 = strongly agree
4 = agree
3 = neutral (neither agree nor disagree)
2 = disagree
1 = strongly disagree

Please answer every statement, even if you are not completely sure of your response.

Please provide the following information about yourself.

Sex (circle): Female Male

Age: ________ years
1. I would be quite bored by a visit to an art gallery.
2. I clean my office or home quite frequently.
3. I rarely hold a grudge, even against people who have badly wronged me.
4. I feel reasonably satisfied with myself overall.
5. I would feel afraid if I had to travel in bad weather conditions.
6. If I want something from a person I dislike, I will act very nicely toward that person in order to get it.
7. I’m interested in learning about the history and politics of other countries.
8. When working, I often set ambitious goals for myself.
9. People sometimes tell me that I am too critical of others.
10. I rarely express my opinions in group meetings.
11. I sometimes can’t help worrying about little things.
12. If I knew that I could never get caught, I would be willing to steal a million dollars.
13. I would like a job that requires following a routine rather than being creative.
14. I often check my work over repeatedly to find any mistakes.
15. People sometimes tell me that I’m too stubborn.
16. I avoid making “small talk” with people.
17. When I suffer from a painful experience, I need someone to make me feel comfortable.
18. Having a lot of money is not especially important to me.
19. I think that paying attention to radical ideas is a waste of time.
20. I make decisions based on the feeling of the moment rather than on careful thought.
21. People think of me as someone who has a quick temper.
22. I am energetic nearly all the time.
23. I feel like crying when I see other people crying.
24. I am an ordinary person who is no better than others.
25. I wouldn’t spend my time reading a book of poetry.
26. I plan ahead and organize things, to avoid scrambling at the last minute.
27. My attitude toward people who have treated me badly is “forgive and forget”.
28. I think that most people like some aspects of my personality.
29. I don’t mind doing jobs that involve dangerous work.
30. I wouldn’t use flattery to get a raise or promotion at work, even if I thought it would succeed.
31. I enjoy looking at maps of different places.
32. I often push myself very hard when trying to achieve a goal.
33. I generally accept people’s faults without complaining about them.
34. In social situations, I’m usually the one who makes the first move.
35. I worry a lot less than most people do.
36. I would be tempted to buy stolen property if I were financially tight.
37. I would enjoy creating a work of art, such as a novel, a song, or a painting.
38. When working on something, I don’t pay much attention to small details.
39. I am usually quite flexible in my opinions when people disagree with me.
40. I enjoy having lots of people around to talk with.
41. I can handle difficult situations without needing emotional support from anyone else.
42. I would like to live in a very expensive, high-class neighborhood.
43. I like people who have unconventional views.
44. I make a lot of mistakes because I don’t think before I act.
45. I rarely feel anger, even when people treat me quite badly.
46. On most days, I feel cheerful and optimistic.
47. When someone I know well is unhappy, I can almost feel that person’s pain myself.

(Continued)
|   | Statement |
|---|-----------|
| 48 | I wouldn't want people to treat me as though I were superior to them. |
| 49 | If I had the opportunity, I would like to attend a classical music concert. |
| 50 | People often joke with me about the messiness of my room or desk. |
| 51 | If someone has cheated me once, I will always feel suspicious of that person. |
| 52 | I feel that I am an unpopular person. |
| 53 | When it comes to physical danger, I am very fearful. |
| 54 | If I want something from someone, I will laugh at that person's worst jokes. |
| 55 | I would be very bored by a book about the history of science and technology. |
| 56 | Often when I set a goal, I end up quitting without having reached it. |
| 57 | I tend to be lenient in judging other people. |
| 58 | When I'm in a group of people, I'm often the one who speaks on behalf of the group. |
| 59 | I rarely, if ever, have trouble sleeping due to stress or anxiety. |
| 60 | I would never accept a bribe, even if it were very large. |
| 61 | People have often told me that I have a good imagination. |
| 62 | I always try to be accurate in my work, even at the expense of time. |
| 63 | When people tell me that I'm wrong, my first reaction is to argue with them. |
| 64 | I prefer jobs that involve active social interaction to those that involve working alone. |
| 65 | Whenever I feel worried about something, I want to share my concern with another person. |
| 66 | I would like to be seen driving around in a very expensive car. |
| 67 | I think of myself as a somewhat eccentric person. |
| 68 | I don't allow my impulses to govern my behavior. |
| 69 | Most people tend to get angry more quickly than I do. |
| 70 | People often tell me that I should try to cheer up. |
| 71 | I feel strong emotions when someone close to me is going away for a long time. |
| 72 | I think that I am entitled to more respect than the average person is. |
| 73 | Sometimes I like to just watch the wind as it blows through the trees. |
| 74 | When working, I sometimes have difficulties due to being disorganized. |
| 75 | I find it hard to fully forgive someone who has done something mean to me. |
| 76 | I sometimes feel that I am a worthless person. |
| 77 | Even in an emergency I wouldn't feel like panicking. |
| 78 | I wouldn't pretend to like someone just to get that person to do favors for me. |
| 79 | I've never really enjoyed looking through an encyclopedia. |
| 80 | I do only the minimum amount of work needed to get by. |
| 81 | Even when people make a lot of mistakes, I rarely say anything negative. |
| 82 | I tend to feel quite self-conscious when speaking in front of a group of people. |
| 83 | I get very anxious when waiting to hear about an important decision. |
| 84 | I'd be tempted to use counterfeit money, if I were sure I could get away with it. |
| 85 | I don't think of myself as the artistic or creative type. |
| 86 | People often call me a perfectionist. |
| 87 | I find it hard to compromise with people when I really think I'm right. |
| 88 | The first thing that I always do in a new place is to make friends. |
| 89 | I rarely discuss my problems with other people. |
| 90 | I would get a lot of pleasure from owning expensive luxury goods. |
| 91 | I find it boring to discuss philosophy. |
| 92 | I prefer to do whatever comes to mind, rather than stick to a plan. |
| 93 | I find it hard to keep my temper when people insult me. |
|   |   |
|---|---|
| **94** | Most people are more upbeat and dynamic than I generally am. |
| **95** | I remain unemotional even in situations where most people get very sentimental. |
| **96** | I want people to know that I am an important person of high status. |
| **97** | I have sympathy for people who are less fortunate than I am. |
| **98** | I try to give generously to those in need. |
| **99** | It wouldn't bother me to harm someone I didn't like. |
| **100** | People see me as a hard-hearted person. |
