

## The Severity of Premenstrual Syndrome: Developing a Descriptive Model based on Personality Traits and Self-Regulation Skills

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### Abstract

**Purpose:** Premenstrual syndrome (PMS) is usually observed among women of reproductive age, so, it may be worsened by emotional and somatic symptoms. The main aim of this investigation was to assess the predictability of pain intensity and psychological distress by personality traits and self-regulation skills among the Iranian female population. **Methods:** The data were collected via numeric pain assessment, DASS-42, NEO, SRQ, and demographic checklist. The significant level was set at 0.05. In this study, we used the method of variance-based structural equations by PLS software. **Results:** Pearson correlation between total score of self-regulation skills and subscales of DASS-42 stress, anxiety, and depression were respectively (0.78), (0.71), and (0.73). Thenceforward, the correlation between pain intensity and total score of self-regulation skills was

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**How to Cite:** Abazari, N., Heydarinasab, L., Farahani, H., Yaghubi, H. (2023). The Severity of Premenstrual Syndrome: Developing a Descriptive Model based on Personality Traits and Self-Regulation Skills, *Journal of Clinical Psychology Studies*, 13(49), 17-36.

(0.72). Moreover, results showed that the correlation between personality traits scores with subscales of DASS-42 stress, anxiety, and depression were respectively (0.71), (0.73), and (0.87). Finally, data analysis demonstrated a correlation between self-regulation skills and pain intensity (0.70). ( $P= 0.05$ ). **Conclusions:** This article shows that personality traits and self-regulation skills can significantly predict the degree of pain intensity and psychological distress among females before and during menstruation concerning the mediating role of suggestibility and attitudes toward menstruation.

**Keywords:** Menstruation, Distress, Pain, Pre-menstruation.



### Introduction

The most accepted definition of premenstrual syndrome (PMS) is a complex of recurring psychological and emotional symptoms that tune into the menstrual cycles (Azaria et al., 2016). These symptoms activate a few days before the commencement of menstruation and drop out of sight a few days later. The accurate opening date of PMS is not determinately predictable, and the onset of these symptoms varies from person to person (Kim, Choi, & Min, 2019). The earliest space of these symptoms is on the fourteenth day of the cycle, and at the latest time, the symptoms begin four days before menstruation (Abramowitz, & Torem, 2018). Generally, the severity of PMS varies from woman to woman, even the severity of these symptoms in different months (Han, Cha, & Kim, 2019). Previous studies have reported that 80% of women experience at least one of the premenstrual symptoms, which are clinically significant in 20 to 50% of women and should be considered as moderate to severe (Mohib, Zafar, & Najam, 2018). In addition, a more severe complex of PMS is seen among 3 to 8% of women, which is considered as severe. The severe symptoms lead to premenstrual dysphoric disorder (PMDD), which can seriously affect individuals, their families, and their relationships (Andreano, & Cahill, 2010). Various elements have been identified as activating and deteriorating factors of PMS. PMS causes severe obstacles in the daily life of affected people and their quality of life. Psychological distress is one of the most prominent premenstrual symptoms that women commonly experience during their premenstrual cycles (Chen, & Francis, 2010). Recent evidence suggests that psycho-social variables, in addition to physiological factors, have been considered as an effective element in psychological distress, and this issue with psychological and psycho-social approaches has been examined (Nourjah, 2008).

Another major issue in PMS is pain which has a significant tie with all three components of cognition, emotion, and behavior simultaneously. Pain is an increasingly important area in symptoms experienced by women, so in 71% of cases, women complained of premenstrual pain (Mousavi, Parnianpour, & Vleeming, 2007). Premenstrual pain may lead to serious social and economic obstacles, for instance, one of the leading causes of women's absence from cc,,,,, ,,,,,, ,, y, add rrrrr rrr aaace ss rr emess aaad aannOOB..e,, & Ismail, 2007). There is a large volume of published studies

describing the role of personality, so that, women with more dramatic personality traits, more bizarre interests than the general population, stricter customs about daily actions and traces of obsessive-compulsive personality, experience more pronounced premenstrual symptoms (Heydarpour, & Dehghan, 2019). More attention should be focused on self-regulation skills that can increase a person's ability to express feelings and emotions, especially negative emotions, thus improving a person's personal functions (Farhanghi, & Ghahari, 2019). The self-regulatory capacity affects the physiological and psychological components of the individual, so the improvement of self-regulatory capacity can affect the severity of symptoms experienced during the premenstrual cycle (Kleinstäuber, Witthöft, & Hiller, 2012).

It has been argued that among psychological factors, suggestibility is the state where a subject is inclined and willing to accept the actions or suggestions of others (Eggert et al., 2016). Suggestibility may lead individuals to shape selective attention, so that it can augment psychological distress (Tasso et al., 2020). There is a consensus that the level of suggestibility is known as an index that can predict the intensity of psychogenic pain (Gurney, Dienes, & Scott, 2022). Therefore, recent evidence suggests that there is a significant negative association between the attitude toward menstruation, considering menstruation as a debilitating event, and complaining about the severity of PMS (Ramaiya et al., 2019). In the same direction, what we know about PMS based on literature is that a more negative attitude toward menstruation leads to failing to predict the changes concerning menstruation (Nguyen et al., 2019). The potential problem is that despite the information obtained from various studies, there have been numerous limitations in research on PMS, such as the motivational status of women with premenstrual symptoms (Carson, 2019). Because it has been demonstrated that women lose their motivation to participate in research to improve their condition during the menstrual cycle (Hendler, 2018). Due to the methodological and sampling difficulties in studies related to PMS, causal conclusions of researches are not comprehensive, even most of them include a minor point of view; therefore, most of the researches do not engage with a wholistic conceptual model that evaluates the effect of personality and psychological variables on premenstrual symptoms (Alladin, & Amundson, 2016). The reader should bear in mind that due to the

research limitations mentioned, moreover the lack of access to a wholistic psycho-social conceptual model to explain the etiology of PMS, in the present study, first of all, the nature and interactive process of variables affecting the occurrence and exacerbation of PMS was approached with a wholistic approach, which is both theoretically and practically critical (Nourjah, 2008; Namenek, 2007).

This paper reviews the research conducted on PMS and attempts to show whether the proposed conceptual model can explain the pain intensity and psychological distress of women during menstruation cycles.

## **Methods**

### ***Population***

This investigation followed a cross-sectional design on 130 female students of Shahed University of Tehran between 20 to 35 years old who were volunteering to participate in the project and studied from January to April 2020.

### ***Procedure***

Samples were selected by employing a stratified sampling method. After fully justifying them and expressing the purpose of the investigation, the standard questionnaires were provided to them. The informed consent was accomplished by the participants; next, they were asked to complete the self-reporting questionnaires. The methodological approach taken in this study was variance-based structural equations via PLS software.

### ***Instruments***

*Demographic checklist.* The researchers made a questionnaire in order to gather socio-demographic data including birth order, recent and remote history of psychiatric, gender, age, degree of education, and place of residence.

*Depression Anxiety and Stress Scale DASS-42.* DASS is a 42-question instrument based on participants' self-report, it is designed to assess the three elements of depression, anxiety, and tension/stress. With regard to Iranian validation studies, the depression subscale of DASS-42 has a high correlation (0.849) with the Beck depression inventory BDI (P: 0.01). The degree of Cronbach alpha for the subscales of depression, anxiety, and stress was observed at 0.94, 0.85, and 0.87

respectively. Moreover, the Cruet-Basssssssssss soooeëeeeee a cii-square amount of 0.794 ( $P: 0.01$ ) (Pooravari et al., 2017).

*The Numerical Pain Rating Scale (NPRS)*. NPRS is a subjective instrument in which participants estimate their pain intensity on a numerical scale. NPRS is made of 0 (no pain at all) to 10 (worst imaginable pain). Academic writers frequently have claimed that a complex scoring classification such as best, worse, and current pain intensity was sufficient to show swings in pain intensity with ultimate reliability. It has been reported that NPRS showed an acceptable construct validity by a significant within-group difference in mean of NPRS score-  $t(63) = 7.57, P < .000001$ , and significantly difference of mean score-  $t(98) = -4.24, P < .000001$  between and improved groups (Yadollahi et al., 2019).

*Miller & Brown Self-Regulation Skills Questionnaire*. The standard self-regulation skills questionnaire was generated by Miller and Brown (1999). This instrument has 63 items and estimates self-regulation out of a five-point Likert scale from one (completely agree) to five (completely disagree). Brown, Miller and Lavondowski (1999) reported the reliability of the instrument by test-retest and Cronbach's alpha 0.94 and 0.91 respectively. In the same way, the validity of this instrument in Iran has been estimated at 0.71 and the reliability coefficient was 0.87 (Abolghasemi, Karimi Yousefi, & Khoshnoodnia Chomachaei, 2017).

*The Stanford Hypnotic Susceptibility Scale*. The Stanford Hypnotic Susceptibility Scale was designed in the late 1950s by Stanford University psychologists André M. Weitzenhoffer and Ernest R. The Stanford Hypnotic Susceptibility Scale is still used to predict subject responses to hypnosis. This instrument scores ranges of suggestibility from 0, for individuals who do not respond to hypnotic suggestions, to 12, for those who accept all of them. Based on literature review, Cronbach's  $\alpha$  values are 0.45, 0.44, and 0.66 for the subscales of perceptive-cognitive abilities, sensory-motor phenomena, and cognitive distortions respectively (Sadeghi, & Ahmadi, 2017).

*The Menstrual Attitudes Questionnaire (MAQ)*. MAQ includes 33 items and was designed by Murs (1993). The instruments subscales consist of menstruation as a debilitating, bothersome and/or natural event, anticipation and prediction of the onset of menstruation, and denial of any effect of menstruation. The literature review shows that

Cronbach's coefficient has been reported from 0.95 to 0.97 (Rabiepoor, Valizadeh, & Barjasteh, 2017).

### *Statistical analysis*

In this study, the descriptive and inferential statistics methods were used for the statistical analysis of the data as follows: In order to choose the method of covariance-based structural equations (AMOS software) or variance-based structural equations (PLS software) to model the studied data, we investigated the assumption of normality of the studied variables using the Kolmogorov-Smirnov test. Since the variables in this modeling were not normal, variance-based structural equations by PLS software were used to fit the studied model.

### **Results**

The number of participants who completed the questionnaires was 138, while 8 cases were excluded because of uncompleted tasks. Finally, we had 130 female students of Shahed University of Tehran who participated in the investigation, and their data were analyzed. On the one side, eligibility criteria required individuals to be in the age range of 20 to 35 years and have a regular monthly premenstrual cycle; on the other side, exclusion criteria required participants not to be pregnant or breastfeeding, not to take immune system suppressive drugs, psychiatric drugs such as anti-depressant, anti-anxiety, anti-psychotic, and mood stabilizing drugs, not being diagnosed with any physical condition that leads to the cessation of menstruation or menopause.

The first set of analyses examined the descriptive data and showed that the mean age of participants was 26.39 (Std. Deviation = 4.294). 65 individuals (50%) of cases were married and 65 of them (50%) were single. Analysis showed that only 24 (18.5%) participants of married persons had children. 50 individuals (38.5%) of cases were B.A. students, 48 individuals (36.9%) of cases were M.A. students and 32 individuals (24.6%) of them were PhD or M.D students. Birth order of 42 (32.3%) was first, 61 (46.9%) was middle and 27 (20.8%) of them was last child. Moreover, 76 (58.5) of them had habituated in their own home and 54 (41.5%) of them had inhabited in dormitory.

The table below illustrates that the mean of pain intensity of participants was 7.05 (Std. Deviation = 2.36), the mean of DASS-42 subscales Depression, Anxiety, and Stress were respectively 16.1 (Std.

Deviation = 9.64), 18.8 (Std. Deviation =9.71) and 16.03 (Std. Deviation =9.45). As can be seen from table 1, the mean of personality traits (NEO) subscales neurotics, extroversion, flexibility, being pleasant, conscientious were respectively 66.98 (Std. Deviation =28.21), 8.33 (Std. Deviation =33.99), 45.38 (Std. Deviation =32.53), 44.61 (Std. Deviation =29.13), 66.46 (Std. Deviation =21.81). Moreover, it is apparent from this table that the mean of attitude to menstruation index was 100.3 (Std. Deviation =41.08) and the mean of suggestibility rate was 8.33 (Std. Deviation =2.57). (Table 1)

**Table 1. Variables descriptive data**

variable	Mean	SD
Pain intensity	7.05	2.36
DASS-42, Depression	16.1	9.64
DASS-42, Anxiety	15.8	9.71
DASS-42, Stress	16.03	9.45
NEO- Neurotics	66.98	28.21
NEO- Extroversion	8.33	33.99
NEO- Flexibility	45.38	32.53
NEO- Being pleasant	44.61	29.13
NEO- Conscientious	66.46	21.81
Self-Regulation Skills	73.11	56.7
Attitude to menstruation	100.3	41.08
Suggestibility	8.33	2.57

Further analysis showed that Pearson correlation between the total score of NEO and subscales of DASS-42 stress, anxiety, and depression were respectively (0.787), (0.731), and (0.724). After that, the correlation between pain intensity and total score of NEO was (0.737). moreover, results showed that the correlation between Self-Regulation Skills with subscales of DASS-42 stress, anxiety, and depression was respectively (0.713), (0.723), and (0.87). Finally, data analysis demonstrated that the correlation between self-regulation skills with pain intensity was (0.705). This result is significant at the  $p = 0.05$ .

These results suggest that standard regression of psychological distress and pain intensity by personality traits is reliable. Results showed that personality traits can predict significantly all three subscales of psychological distress (depression, anxiety, and stress), so data analysis demonstrated that personality traits can predict significantly pain intensity of menstruation among females ( $P=0.05$ ).



These results indicate that standard regression of psychological distress and pain intensity by self-regulation skills is reliable. Results showed that self-regulation skills can predict significantly all three subscales of psychological distress (depression, anxiety, and stress), moreover, data analysis demonstrated that more self-regulation skills can predict significantly pain intensity of menstruation among females ( $P=0.05$ ).

The research model based on the effect of personality traits and self-regulatory skills on the severity of premenstrual symptoms, considering the mediating role of suggestibility and attitudes toward menstruation has a sufficient fit. Due to the abnormality of the sample, in this study, we used the method of variance-based structural equations by PLS software. Considering the combined reliability index and Cronbach's alpha above 0.7 and the AVE index of approximately 0.3, the type of definition of hidden variables in this study can be summarized in terms of coefficient statistics,  $S$ , test statistics and significance for the initial model were fitted, the coefficients with P-value less than 5% were removed from the model and the model without these coefficients was re-fitted. In this study, the GOF index of the final model was 69%. Since the final model of this study all had a P-value of less than 5% and also a model with a GOF index of more than 30%, the appropriateness of the research model of this study can be ensured. The highest percentage of correct explanation and prediction in the model was for the variability of pain and then stress, anxiety and depression. The variables of self-regulation, suggestibility, extroversion, conscience, openness, flexibility, attitudes toward menstruation and neurosis, respectively, have the maximum to the least effect on psychological distress (stress, depression and anxiety) and the severity of self-perceived pain perception.

This study set out with the aim of assessing the fitness of the model, so in the following table, the hypothesis of normality of variables was tested by the Kolmogorov-Smirnov test, the current study found that the hypothesis of normality of variables is rejected. (Table 2)

**Table 2. Investigation of the hypothesis of normality of the studied variables using Klomokorf-Smirnov test**

Variables	Test statistics	DF	P-value
Pain intensity	0.211	350	<0.001
Suggestibility	0.198	350	<0.001
attitudes toward menstruation	0.198	350	<0.001
Self-regulation skills	0.221	350	<0.001
Depression	0.098	350	<0.001
Anxiety	0.081	350	<0.001
Stress	0.067	350	<0.001
Neurosis	0.166	350	<0.001
Extroversion	0.256	350	<0.001
Openness	0.246	350	<0.001
Agreement	0.220	350	<0.001
Conscience	0.098	350	<0.001

According to the data presented in this table and observing the combined reliability index and Cronbach's alpha above 0.7 and the AVE index of approximately 0.3, the appropriateness of the definition of hidden variables in this study can be ensured. (Table 3)

**Table 3. Investigation of AVE indices, Composite reliability, Cronbach's alpha and the degree of commonality of the studied hidden variables**

Variables	AVE	Combined reliability	Cronbach's alpha	Subscription rate
Pain intensity	1.00	1.00	1.00	1.00
Suggestibility	1.00	1.00	1.00	1.00
attitudes toward menstruation	0.67	0.99	0.99	0.67
Self-regulation skills	0.54	0.99	0.99	0.54
Depression	0.30	0.86	0.82	0.30
Anxiety	0.30	0.86	0.82	0.30
Stress	0.29	0.85	0.80	0.29
Neurosis	0.31	0.95	0.95	0.31
Extroversion	0.31	0.98	0.98	0.49
Openness	0.46	0.97	0.97	0.46
Agreement	0.48	0.98	0.98	0.48
Conscience	0.25	0.94	0.93	0.25

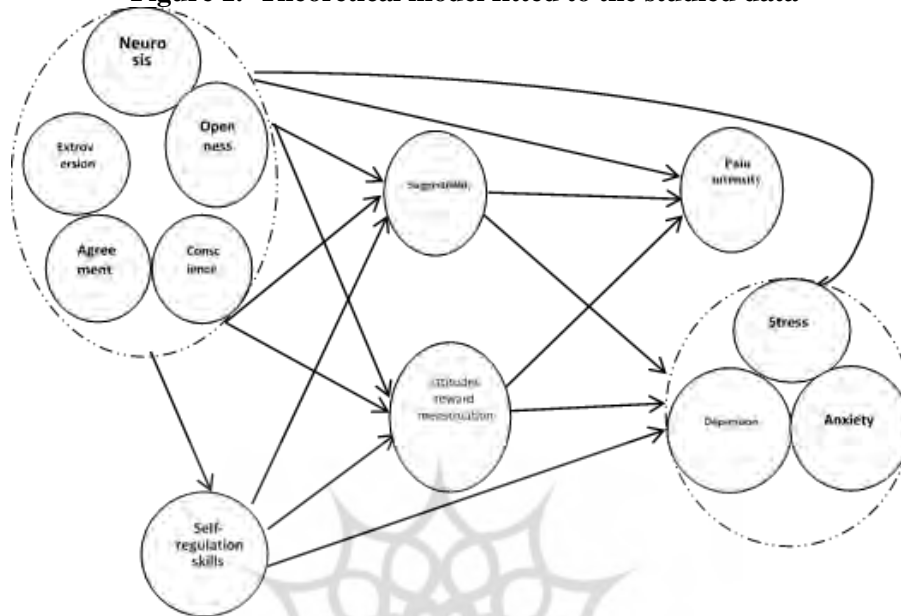
Overall, these results indicate that since the variables of the final model of this study all had a P-value of less than 5% and also the model with a GOF index of more than 30%, we can ensure the

appropriateness of the suggested model of this study. (Table 4)

**Table 4. Summary of coefficients  $\beta$ , SE, test statistics and significance for the final model fitted**

Variable			$\beta$	EE	Test statistics	P-value
Independent		Dependent				
Extroversion	→	attitudes toward menstruation	0.38	0.07	5.30	0
Extroversion	→	Self-regulation skills	0.55	0.12	4.45	0
Openness	→	Pain intensity	-0.12	0.03	3.67	0
Openness	→	Self-regulation skills	-0.36	0.14	2.36	0.009
Agreement	→	Self-regulation skills	0.32	0.14	2.36	0.018
attitudes toward menstruation	→	Stress	0.2	0.06	3.12	0.002
Neurosis	→	attitudes toward menstruation	-0.31	0.08	3.63	0
Neurosis	→	Stress	0.25	0.08	3.25	0.001
Suggestibility	→	Depression	0.47	0.12	4.07	0
Suggestibility	→	Anxiety	0.43	0.13	3.38	0.001
Suggestibility	→	Pain intensity	0.52	0.08	6.84	0
Suggestibility	→	Stress	0.41	0.11	3.80	0
Self-regulation skills	→	Depression	-0.28	0.12	2.38	0.017
Self-regulation skills	→	Anxiety	-0.34	0.12	2.75	0.006
Self-regulation skills	→	attitudes toward menstruation	-0.24	0.08	3.05	0.002
Self-regulation skills	→	Pain intensity	-0.33	0.08	3.98	0
Self-regulation skills	→	Stress	-0.27	0.12	2.19	0.029
Self-regulation skills	→	Suggestibility	-0.87	0.03	31.92	0
Conscience	→	attitudes toward menstruation	-0.39	0.08	4.93	0
Conscience	→	Suggestibility	0.09	0.03	2.71	0.007
Conscience	→	Self-regulation skills	-0.37	0.05	7.13	0

**Figure 1. Theoretical model fitted to the studied data**



### Discussion

This paper has argued that personality traits and self-regulation skills can significantly predict the degree of pain intensity and psychological distress among females before and during menstruation. This study has found that generally, our results on personality traits are consistent with the previous study that showed therapeutic outcomes of pain alleviation, so some personality traits among females can affect pain intensity before and during menstruation (Sell, Möller, & Taubner, 2018). In line with the results obtained from this research, studies conducted among Iranian women have previously reported that personality traits and self-regulation skills have a significant relationship with the severity of premenstrual symptoms (Mohammadi et al., 2020; Nasiri et al., 2021); with the difference that in Iranian studies, the main relationship observed was between psychological distress and extroversion (Panahi, & Faramarzi, 2016; Akaberian et al., 2013), this is despite the statement that international research literature has indicated a significant relationship between neuroticism and psychological distress (Setyowati, & Ungsianik, 2019; Pearlstein et al., 2005). In addition, the results reported in Iranian studies and the research literature of other countries, in line with the results obtained

from the present study, believe that there is a significant relationship between the intensity of premenstrual pain, personality characteristics and premenstrual skills (Mohammadi et al., 2020; Setyowati, & Ungsianik, 2019; Nasiri et al., 2021). Meanwhile, it has been emphasized that among the Iranian population, family support, family history of severe premenstrual symptoms and self-regulation skills can equally predict the severity of premenstrual pain (Farahmand et al., 2017; Doost, & Yousefi, 2014).

Another comprehensive study found that females with a higher rate of neurosis, profit from pain relief-oriented treatments even by prescribing a placebo significantly; what is interesting in this report is that these individuals are at risk of relapse and also suffer more pain intensity before menstruation (Setyowati, & Ungsianik, 2019). One of the important causes proposed in the relationship between personality traits and pain intensity is that personality traits in the first step can speed up classic conditioning, so in the second step, conditioning keeps on pain perception and deteriorates pain intensity among females (Pearlstein et al., 2005). In contrast, it should be pointed out that it has been considered in another study that existing data about the contribution of personality traits to pain intensity is not enough (Temel, Terzioglu, & Isik Koc, 2018).

Our findings about the predictability of psychological distress by personality traits were consistent with other investigations. On the one hand, it has been shown that personality traits can make individuals vulnerable to stress and anxiety; on the other hand, personality traits (especially flexibility and conscientious) develop false memories which this kind of memories make females feel depressed mood (Sell, Möller, & Taubner, 2018; Temel, Terzioglu, & Isik Koc, 2018). Another study has suggested that individuals with higher levels of neurosis need more social support to feel peace of mind; thus, dependency on others makes them undergo more psychological distress (Kessel, 2000). Moreover, it has been assessed that conscientiousness can disrupt coping strategies among individuals, and also consistent with our results, it has been demonstrated that more extroversion can predict more precepted psychological distress (Chrisler, 2002).

The findings of this study, besides the literature review, suggest that our results about the predictability of psychological distress by self-regulation skills are consistent with previous related articles

(Chang, & Hsu, 1997; Peiffer, & Trull, 2000; Mohseni-Bandpei et al., 2009). In the same direction, one of the most repeated reports of studies has shown that poor self-regulation skills can develop stereotypes and myths, which, most of which are distressing for individuals (Chrisler, 2002; Peiffer, & Trull, 2000). A possible explanation for these results may come from the investigation, which claims that poor self-regulation skills cause general psychological sensitivity, so emotional sensitivity makes individuals vulnerable to becoming psychologically distressed (ALAVI, Poushaneh, & Khosravi, 2009). Based on another research that has been carried out about the predictability of psychological distress by poor self-regulation skills, there is a possibility that females with poor self-regulation skills have more difficulty with seeking help; therefore, inhibition in talking about precepted negative feelings and used to using only internal attributions about feelings, make individuals feel more psychologically distressed (Setyowati, & Ungsianik, 2019; Temel, Terzioglu, & Isik Koc, 2018). So far, a factor has been identified as being an important issue; poor self-regulation skills are one of the critical risk factors that can lead individuals with intensive premenstrual symptoms to attempt suicide (Carson, 2019; Chrisler, 2002). Moreover, it has been approved that psychological distress caused by poor self-regulation skills, makes females get learned helplessness (Kessel, 2000).

Our investigation is consistent with the literature showing that pain intensity can be predicted by self-regulation skills about menstruation among the Iranian female population, same as other aaiiaaiiiiies OOBeee, & Imnall, ;;;; ; aaangii, & hh aaa,,, 9999.. Pain intensity among menstruating females varies from person to person, at the same time, there is a significant difference among individuals suffering intensive pain, due to females with poor self-regulation skills about menstruation, undergoing more dysfunctions and worse disabilities caused by menstruating pain (Sepede et al., 2019). There has been agreement that self-regulation skills are so effective on menstruating pain perception that females with more eaaaiiee attttees aaaa rd aaaaaaaaamn ca'' t rr ffft rrrr aeiii c gaass of pain treatments (Pellicer et al., 2018). In other words, the weaker self-regulation skills, the more intensive menstruating pain perception, and moreover, the more resistance to the improvement of pain by different treatments (Valentine et al., 2019). Throughout this paper,

our results about suggestibility are consistent with the study that showed therapeutic outcomes of pain alleviation, depending on the level of suggestibility, in the same way the more suggestibility level among females develops the more pain intensity before and during menstruation (Nourjah, 2008). Actually, improved self-regulation skills make it possible for a person to use a more useful coping method when faced with stressful events, in the same direction, reducing the level of suggestibility, preventing impulsive accidental reactions, and the formation of malfunctioning conditionings (Nguyen et al., 2019). In the clinical situation, it has been observed that many of those who feel severe symptoms or complain about menstruation, don't even comply with menstrual hygiene; maybe lack of hygiene menstruation is the result of a low level of self-regulation skills and negative attitude towards menstruation, so they think that no matter how hard they try, they cannot have an effect on controlling the symptoms (Kalyani, Bicholkar, & Cacodcar, 2019).

Some important limitations need to be considered; one of the important limitations of the present study was not using a combination of qualitative and quantitative methods. The other limitation was solely using self-report instruments to measure the variables such as pain intensity rather than clinical observations or biological indicators. This is an important issue for future research in order to measure, and use the biological instruments to score variables such as pain intensity. Future studies on the current topic are therefore recommended that concerning the multifactorial etiology of PMS, use a combined method in future investigations.

### **Conclusion**

Finally, concerning the primary aims of the current investigation and in line with the related research literature, it is apparent that the hypothesized model based on the influence of personality traits and self-regulation skills on pain intensity and psychological distress, considering the mediative role of suggestibility and attitude towards menstruation has enough fit.

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**How to Cite:** Biniaz, A., Biniaz, A., Biniaz, A. (2023). The Severity of Premenstrual Syndrome: Developing a Descriptive Model based on Personality Traits and Self-Regulation Skills, *Journal of Clinical Psychology Studies*, 13(49), 17-36.



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