

# An Analysis of Personal Indecisiveness and Problem Solving in Women with Premenstrual Syndrome: A Cross-Sectional Study in Turkey

Esra Sabancı Baransel <sup>1(ID)</sup> Tuba Ucar <sup>1(ID)</sup> Esra Guney<sup>1(ID)</sup>

<sup>1</sup>Midwifery Department, Faculty of Health Sciences, İnönü University, Malatya, Turkey  
University

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## Abstract

**Objective:** Premenstrual syndrome (PMS) is a cyclical disorder that emerges at the luteal stage of the menstrual cycle, cognitive, emotional, and behavioral changes. This study was conducted to determine the relationship between premenstrual syndrome (PMS), personal indecisiveness, and problem solving among female university students.

**Methods:** This cross-sectional study was conducted with 1,157 female students in a university in the eastern region of Turkey. Data were collected using the Introductory Information Form, Premenstrual Syndrome Scale, Personal Indecisiveness Scale, and Problem-Solving Inventory. Students were classified as those who had PMS and those who did not based on the results of the Premenstrual Syndrome Scale.

**Results:** Of the students in this study, 70.4% were found to have PMS. According to the logistic regression analysis, it was determined that the rates of indecision (OR:1.062), being impetuous while making decisions (OR:1.063), and being exploratory while making decisions (OR:1.055) were higher in students with PMS than students without PMS. Moreover, the rates of insufficient self-perception in solving problems (OR:0.952), being avoidant in solving problems (OR:1.084), no self-confidence in solving problems (OR:1.066), and acting without thinking while solving problems (OR:1.091) were higher among students with PMS compared to those who did not have the condition.

**Conclusion:** The results of this study indicate that PMS was an important risk factor for indecisiveness and inadequacy in problem solving.

**Key words:** Premenstrual syndrome, personal indecisiveness, problem solving, menstruation

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## Address for correspondence/reprints:

Tuba Uçar

**Telephone number:** +90 (536) 761 80 76

**E-mail:** tuba.ucar@inonu.edu.tr

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## **Introduction**

Premenstrual syndrome (PMS) is a cyclical disorder that emerges at the luteal stage of the menstrual cycle, which regresses as menstruation begins and shows itself through bodily, cognitive, emotional, and behavioral changes (1). PMS may emerge at any age following menarche and is quite common among women. According to reports, approximately 80% of women experience at least one mild PMS symptom (2), 20–50% experience moderate symptoms (3), and approximately 5% experience severe symptoms that negatively affect their lives (1-4). Mood and behavioral changes are among the most common PMS symptoms. The most frequent mood change symptoms include indecisiveness, tension, irritability, impatience, attention deficit, and forgetfulness (3, 5, 6).

The decision-making process is performed by recognizing and defining a decision-requiring case, collecting information and determining the options, examining and assessing the options, selecting and implementing the option that will yield the most positive and effective results, performing a selection once again after assessing the results, and receiving feedback regarding the selection (7-9). The decision-making process can be regarded as a process of establishing balance in one's internal world (7, 8). Indecisiveness, however, can delay the process of conducting an action (10). Therefore, it may adversely affect people's daily routines and cause them to become doubtful or even neurotic (11). It is known that some stimuli triggered by daily events also trigger PMS in women with doubtful and neurotic (12).

The decision-making process is also required for solving problems. A problem is mainly an event that prevents one from reaching one's goals (7, 8, 11). Problem solving is a process in which cognitive and psychological tools are employed to terminate any sorts of difficulties encountered on the way to reaching certain goals that require certain efforts (13). Both the decision-making process and problem-solving skills consist of different dimensions and are affected by different cases. When studies involving PMS were examined in the literature, it was found that many dimensions related to PMS were evaluated, but no studies could be found on how PMS affects both of these cognitive processes. Healthcare professionals need to learn more about emotional distress in women with PMS, including indecision and difficulty in solving problems. For this reason, it is important to investigate the relationship between PMS, indecisiveness, and problem-solving efficiency. Therefore, this study aimed to determine

the prevalence of personal indecision and problem-solving difficulties in students with PMS to contribute to the relevant literature.

## **Methods**

### **Research Design and Sample**

This cross-sectional study was performed with female students studying at an university, which is located in the eastern part of Turkey. There were 15 faculties at the time at which the study was conducted, and there were 18,800 female students studying in these faculties. A statistical program, which was the publicly available OpenEpi version 3, was used to calculate the sample size (<http://www.openepi.com>). In the power analysis, when the prevalence of PMS was accepted as 62% (14), the sample size was calculated to be at least 1,157 students, with two-way significance level, 97% confidence interval and 80% power to represent the population.

The number of students from each faculty was determined in proportion to the weighted figures for faculties in the entire population. The faculties whose students were included were as follows: Faculty of Education (n=165; 1,910 students in total); Faculty of Science and Letters (n=126; 1,458 students in total); Faculty of Economics and Administrative Sciences (n=163; 1,886 students in total); Faculty of Divinity (n=76; 880 students in total); Faculty of Engineering (n=75; 868 students in total); Faculty of Health Sciences (n=265; 3,067 students in total); Faculty of Medicine (n=38; 440 students in total); Faculty of Pharmacy (n=15; 174 students in total); Faculty of Dentistry (n=27; 312 students in total); Faculty of Fine Arts, Design, and Architecture (n=36; 417 students in total); Faculty of Law (n=38; 440 students in total); Faculty of Communication (n=44; 510 students in total); Faculty of Sports Sciences (n=50; 579 students in total); Faculty of Agriculture (n=13; 151 students in total); and Faculty of Nursing (n=26; 301 students in total). The students in these faculties were listed using the simple random sampling method—a probability sampling method—and students within the samples were determined using a random number table. The inclusion criteria were being between 18 and 49 years of age, being single or married, and having no children. Students who did not have any diagnosed psychiatric disorder, declared that they had regular menstrual periods (every 22-35 days), did not have any diagnosed somatic diseases or gynecological or hormonal disorders and were not using any medication or contraceptive pills were included in the study. Participants' verbal consent

was obtained before the initiation. The researchers stated to the participants that the data obtained would be published for scientific purposes, without using their names, and that they could leave the study at any time. The study was assessed by the Ethics Committee of Health Sciences, and their consent was obtained (Decision no: 2018/13-1).

### **Measures**

The data were collected between May and July 2018 using an Introductory Information Form, the Premenstrual Syndrome Scale, the Personal Indecisiveness Scale, and the Problem-Solving Inventory. The questionnaire forms were personally filled out by the students. The Introductory Information Form was created by the researchers and included items examining certain sociodemographic and menstrual cycle characteristics of the students. With respect to the sociodemographic characteristics, questions on the student's age, place of residence, and department were asked, and the menstrual cycle characteristics questions targeted information such as the menarche age, and duration of menstrual flow.

#### **Premenstrual Syndrome Scale (PMSS)**

The PMSS was developed by Gençdoğan (2006) with the aim of measuring the severity of premenstrual symptoms. This 5-point Likert-type scale has 44 items. The scale has nine subdimensions for PMS syndromes, such as depressive feelings, anxiety, fatigue, irritability, depressive thoughts, pain, changed appetite, changed sleep, and swelling. The total PMSS score is obtained from the total score of the nine subdimensions. The lowest score that could be obtained on the scale is 44, while the highest score is 220. The higher the score is, the more severe the PMS symptoms are. While assessing the results of the PMSS, the presence of PMS is evaluated in terms of whether the score is higher than 50% of the highest possible score on the entire scale and its subdimensions. For instance, the highest score possible is 220, and accordingly, 50% of this score is 110 points. Therefore, scores of 111 and above are indicative of PMS. The Cronbach's alpha was 0.75 for the scale (12), and this value was found to be 0.96 for this study.

#### **Personal Indecisiveness Scale (PIS)**

The PIS scale developed by Bacanlı (2005) consists of 18 items to measure how people make decisions and how indecisive they are. The scale has two subdimensions: Exploratory Indecisiveness and Impetuous Indecisiveness. Exploratory Indecisiveness contains items such as "I make my

decisions and give up quickly," while Impetuous Indecisiveness has items such as the following: "I have difficulties when I need to make urgent decisions." The possible scores on this 5-point Likert-type scale range from 18 to 90. The scores for the Exploratory Indecisiveness subdimension range between 10 and 50, and the scores for the Impetuous Indecisiveness subdimension vary between eight and 40. A higher score means a higher level of indecisiveness, while a lower score indicates that decision-making skills are adequate. Cronbach's alpha of this scale was 0.90 (14), which was found to be 0.94 for this study.

#### **Problem Solving Inventory (PSI)**

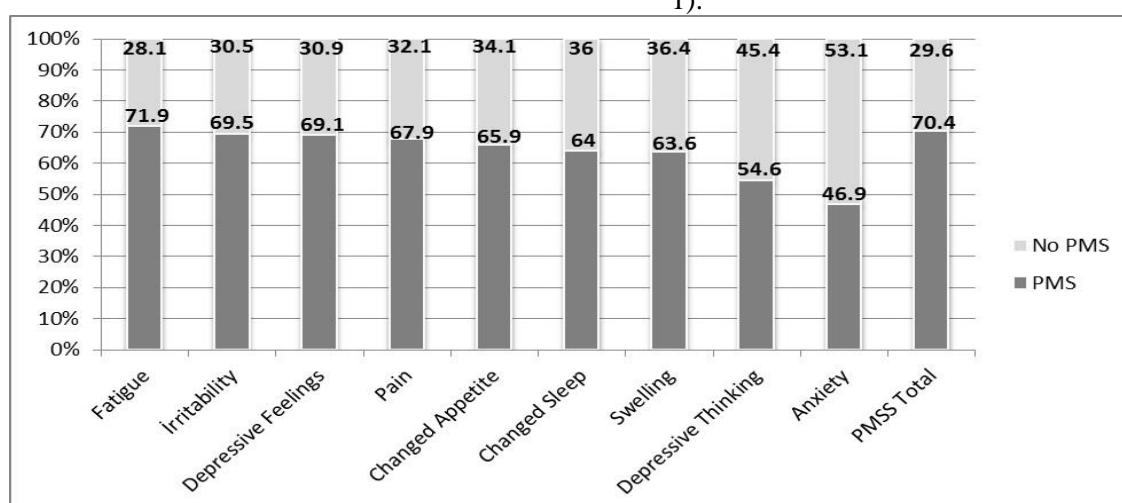
This inventory was developed by Heppner and Petersen in 1982 and adapted into Turkish by Şahin, Şahin, and Heppner in 1993. The PSI is an instrument that assesses what people think about problem solving and relevant approaches. It has six subdimensions based on approaches: an avoidant approach, a self-confident approach, a thinking approach, a planned approach, an impetuous approach, and an evaluator approach. With 32 items assessed within this 6-point Likert-type scale, the lowest possible score is 32, while the highest is 192. A higher score on the entire inventory indicates that the individual perceives themselves as inadequate in terms of problem-solving skills. Cronbach's alpha of this inventory was 0.88 (15), which was found to be 0.71 in this study.

#### **Statistical Analysis**

The data were assessed using the Statistical Package for the Social Sciences version 25.0 for Windows (SPSS Inc., Chicago, IL). The Kolmogorov-Smirnov test was used to measure the goodness of fit, and the data were found to show normal distribution. To compare the quantitative variables between the students who did and did not have PMS, an independent t-test and a chi-squared test were utilized to compare the categorical data. The variables affecting the severity of PMS symptoms were determined using backward stepwise logistic regression analysis. To determine the impact of each independent variable (menarche age, personal indecisiveness, and problem-solving skills) on the dependent variable (PMS), variables at  $P < .05$  were included within the logistic regression analysis. The significance level was accepted as 0.05.

## Results

A total of 1,157 female students participated in the study. Their mean PMSS score was  $127.65 \pm 35.50$ , and 70.4% (n=817) had PMS, while 29.6% (n=343) did not have the condition. The PMS symptoms reported by the students included the following: fatigue (71.9%), irritability (69.5%), depressive feelings (69.1%), pain (67.9%), changed appetite (65.9%), changed sleep (64.0%), swelling (63.6%), depressive thoughts (54.6%), and anxiety (46.9%) (Figure 1).



**Figure 1.** Prevelance of PMS symptoms in students

## Bivariate analysis with PMSS

Table 2 presents the relationship between PMS, personal indecisiveness, problem solving, and the relevant subdimensions. A positive and significant relationship was found between the PMSS scores, PIS total scores, and exploratory and impetuous approach scores ( $r=.519$ ,  $r=.490$ , and  $r=.484$ , respectively;  $p<0.05$  for all). A positive and significant relationship was also found between the PMSS scores, PSI total scores, and the avoidant, self-confident, thinking, and planned approach scores ( $r=.103$ ,  $r=.114$ ,  $r=.107$ ,  $r=.195$ , and  $r=.135$ , respectively;  $P<0.05$  for all). In contrast, a negative and significant relationship was found between the PMSS scores and the impetuous approach scores ( $r=-.155$ ;  $P<0.05$ ) (Table 2).

Table 3 presents comparison of PIS and PSI average scores of students according to the presence of PMS. Students with PMS had higher total indecisiveness scale scores and higher mean subscale scores compared to those who did not have PMS; a statistically significant difference was also found between the groups ( $p<0.001$ ). Students with PMS had higher total PSI scores and higher mean self-confident, thinking, planned, and avoidant approach

## Baseline Characteristics of Female Students

The comparison of the distribution of characteristics of students according to the presence of PMS is presented in Table 1. It was determined that there was no significant difference between the groups of students who had PMS and those who did not in terms of age, place of residence, department, body mass index, duration of menstrual flow, and postmenstruation duration ( $P>0.05$ ). However, the difference in terms of menarche age between the groups of students who did and did not have PMS was found to be statistically significant ( $P<0.05$ ) (Table 1).

subscale scores compared to those who did not have PMS; a statistically significant difference was also found between the groups ( $p<0.001$ ). Students who did not have PMS had a higher mean impetuous approach subscale score in terms of problem solving compared to those with PMS; a statistically significant difference was also found between the groups ( $p<0.001$ ) (Table 3).

## The Logistic Regression Model of PMS Symptoms

The bivariate analyses revealed that there was a significant relationship between PMS and menarche age, PIS score, PSI score, and the subdimension scores. The results of the logistic regression analysis within the model established with the factors noted above are presented in Table 4. According to the results, students whose menarche age was 12 years and under (OR: .828), and who exhibited the indecisive approach (OR: 1.062), were impetuous while making decisions (OR: 1.063), and were exploratory while making decisions (OR: 1.055) were determined to be at an increased risk for developing PMS. In addition, students' inadequate self-perception (OR: .952), avoidance (OR: 1.084), lack of self-confidence (OR: 1.066), and acting without thinking in problem solving (OR: 1.091) were determined to be important risk factors for PMS (Table 4).

**Table 1.** Comparison of the distribution of characteristics of students according to the presence of PMS

Characteristics	No PMS (n=343)		PMS (n=814)		Total (n=1157)		Test and P value
	n	%	n	%	n	%	
<b>Age, y</b>							
17-20	159	29.5	380	70.5	539	46.6	$\chi^2=3.162$
21-22	120	27.6	314	72.4	434	37.5	$P=0.206$
$\geq 23$	64	34.8	120	65.2	184	15.9	
<b>Place of residence</b>							
Home	142	31.2	313	68.8	455	39.3	$\chi^2=0.879$
Dormitory	201	28.6	501	71.4	702	60.7	$P=0.349$
<b>Department</b>							
Life Science	60	28.0	154	72.0	214	18.5	$\chi^2=1.867$
Social Sciences	148	28.4	374	71.6	522	45.1	$P=0.393$
Health Sciences	135	32.1	286	67.9	421	36.4	
<b>Body mass index<sup>a</sup></b>							
Weak ( $\leq 18.5$ )	53	31.5	115	68.5	168	14.5	$\chi^2=0.532$
Normal (18.6 - 24.9)	252	29.5	625	70.5	887	76.7	$P=0.766$
Overweight ( $\geq 25$ )	38	27.5	74	72.5	102	8.8	
<b>Age of menarche, y</b>							
$\leq 12$	62	22.5	214	77.5	276	23.9	$\chi^2=8.964$
$> 12$	281	31.9	600	68.1	881	76.1	$P=0.003$
<b>Duration of menstrual flow, d</b>							
3-6	233	31.1	516	68.9	749	64.7	$\chi^2=2.178$
7-11	110	27.0	298	73.0	408	35.3	$P=0.140$
<b>Post-menstruation duration</b>							
Currently mens	70	27.2	187	72.8	257	22.2	
Within 1 week after mens	79	30.2	133	69.8	262	22.6	$\chi^2=2.310$
Within 2 week after mens	98	32.7	202	67.3	300	26.0	$P=0.511$
Within 3 week after mens	96	28.4	56	71.6	338	29.2	

a Calculated as weight in kilograms divided by height in meters squared.

**Table 2.** The relationship between PMS, personal indecisiveness, problem solving, and the relevant subdimensions (n=1157)

	Mean	SD	PIS Total	Exploratory	Impetuous	PSI	Avoidant	Self-confident	Thinking	Planned	Impetuous	Evaluat	or
							Total						
<b>Depressive feelings</b>	21.03	6.87	.415**	.401**	.375**	.060*	.031	.079**	.148**	.132**	-.122**	-.023	
<b>Anxiety</b>	17.30	6.59	.481**	.442**	.463**	.099**	.177**	.078**	.131**	.101**	-.140**	.032	
<b>Fatigue</b>	18.87	5.85	.405**	.386**	.374**	.073*	.088**	.073*	.154**	.101**	-.116**	-.027	
<b>Irritability</b>	15.42	5.41	.421**	.394**	.397**	.072*	.078**	.080**	.152**	.107**	-.134**	.005	
<b>Depressive thoughts</b>	18.77	6.90	.542**	.500**	.520**	.101**	.141**	.083**	.146**	.135**	-.144**	.035	
<b>Pain</b>	9.02	3.07	.327**	.313**	.299**	.091**	.014	.125**	.198**	.111**	-.093**	-.050	
<b>Changed appetite</b>	9.17	3.47	.209**	.212**	.177**	.047	.025	.062*	.130**	.049	-.074*	-.027	
<b>Changed sleep</b>	8.87	3.43	.381**	.356**	.359**	.112**	.127**	.105**	.158**	.064*	-.073*	-.020	
<b>Swelling</b>	9.15	3.77	.257**	.253**	.227**	.065*	.046	.089**	.184**	.104**	-.146**	-.013	
<b>PMSS total</b>	127.65	35.50	.519**	.490**	.484**	.103**	.114**	.107**	.195**	.135**	-.155**	-.006	

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

SD: Standard Deviation; PIS: Personal Indecisiveness Scale; PSI: Problem Solving Inventory; PMSS: Premenstrual Syndrome Scale

**Table 3.** Comparison of PIS and PSI average scores of students according to the presence of PMS

Scales	No PMS (n=343) Mean ± SD	PMS (n=814) Mean ± SD	Test and P value	
<b>PIS Total</b>	41.00±13.90	56.75±18.42	t= -15.907	P<0.001
Exploratory	23.90±8.44	32.85±10.77	t= -15.103	P<0.001
Impetuous	17.09±6.72	23.90±8.97	t= -14.165	P<0.001
<b>PSI Total</b>	100.38±16.65	103.99±14.40	t= -3.498	P<0.001
Avoidant	10.84±5.08	12.23±4.97	t= -4.326	P<0.001
Self-confident	19.68±5.66	20.72±5.19	t= -2.923	P<0.001
Thinking	15.53±5.76	17.19±5.30	t= -4.738	P<0.001
Planned	12.05±3.94	12.85±3.54	t= -3.372	P<0.001
Impetuous	33.08±7.90	31.79±6.97	t= 2.624	P<0.001
Evaluator	9.17±3.77	9.17±3.57	t= -0.032	P=0.975

SD: Standard Deviation; PIS: Personal Indecisiveness Scale; PSI: Problem Solving Inventory; PMS: Premenstrual Syndrome

**Table 4.** Logistic regression analysis performed to examine the effect of students' menarche age, personal indecisiveness, problem solving, and sub-dimensions on PMS (n=1157)

	B	SE	df	P	OR	95% CI	
						Lower	Upper
<b>Age of menarche<sup>a</sup>, y</b>							
≤ 12	(Reference)						
> 12	-0.188	.057	1	0.001	.828	.741	.926
<b>PIS Total<sup>b</sup></b>	0.060	.011	1	<0.001	1.062	1.039	1.086
<b>PIS Exploratory<sup>b</sup></b>	0.061	.011	1	<0.001	1.063	1.039	1.087
<b>PIS Impetuous<sup>b</sup></b>	0.054	.015	1	<0.001	1.055	1.025	1.086
<b>PSI Total<sup>b</sup></b>	-0.049	.023	1	0.035	.952	.909	.997
<b>PSI Avoidant<sup>b</sup></b>	0.081	.029	1	0.006	1.084	1.024	1.148
<b>PSI Self-confident<sup>b</sup></b>	0.061	.032	1	0.047	1.066	1.001	1.133
<b>PSI Thinking<sup>b</sup></b>	0.087	.027	1	0.001	1.091	1.034	1.151
<b>PSI Planned<sup>b</sup></b>	0.040	.043	1	0.359	1.041	.956	1.133
<b>PSI Impetuous<sup>b</sup></b>	0.031	.025	1	0.218	1.031	.982	1.083

<sup>a</sup> Categorical data were used.

<sup>b</sup> Numerical data were used.

PIS: Personal Indecisiveness Scale; PSI: Problem Solving Inventory; PMS: Premenstrual Syndrome

B: Regression Coefficient; SE: Standard Error; OR: Odds Ratio; CI: Confidence Interval.

## **Discussion**

In this study conducted with university students in Turkey, the prevalence of PMS was determined to be high at 70.3%. This finding is consistent with the results of previous studies in our country reporting a prevalence of PMS between 5% and 72% (16-18). The prevalence of PMS among women of the same age group was reported by Tanrıverdi et al. to be 67.5% (19), by Yaşar et al. to be 70.2% (20), and by Pınar et al. to be 72.1% (21), which is also consistent with the results of the present study. Studies conducted outside Turkey have reported the PMS prevalence to be between 6% and 85% among adolescents (22-25). The PMS prevalence among adolescents living outside Turkey was reported to be 60.3% by Silva et al. (26) and 84.3% by Houston et al. (27). The broad range of PMS prevalence within the literature may be due to the different age groups of the women forming the samples and from the absence of a global method for defining PMS.

This study found the most common symptoms in the premenstrual period of the students to be fatigue, irritability, depressive feelings, pain, changed appetite, and changed sleep, in order of prevalence. Other studies have also reported complaints such as fatigue, depression, and irritability during PMS (28-30). It is widely known that these complaints can significantly affect students' self-confidence, social and family relationships, and academic success (31-33).

In this study, the PMS prevalence was found to be higher in students whose first menarche age was 12 and below. The literature emphasizes that the relationship between menarche age and PMS is not clear (22, 33). In addition to the existence of studies reporting that a younger age of first menarche increases the risk of PMS (33), there are also studies that do not support this relationship (33). Nevertheless, it has been established that one of the most important causes of PMS is hormonal factors (33-34). Thus, a probable reason for the association between early menarche and PMS has been attributed to the similarity of hormonal patterns in early maturing and adult women (35).

This study found that students were more indecisive and impetuous in addition to being not exploratory while making a decision during PMS compared to those not who did not have PMS. This result may indicate that PMS negatively affects decision making. Studies conducted in various fields have found that individuals who were indecisive were in more adverse circumstances in terms of variables affecting their psychological health, and were therefore more likely to have problems with self-

respect, self-confidence, shyness, creativity, perfection, control, and personal and social engagement (36, 37). Moreover, indecisiveness, distrust, shyness, dependency, and dissatisfaction with oneself have been found to be related (38). Some researchers have also indicated that there is a significant relationship between considering oneself as negative and indecisiveness (36, 38). While the existing literature does not include any studies examining the relationship between PMS and indecisiveness, the results of this study support the relationship between these variables.

This study also found a significant relationship between PMS and problem solving in students through a bivariate analysis. According to the results of the regression analysis with the variables affecting PMS, students with PMS had higher self-perception while problem solving, were more avoidant in problem solving, were less confident in problem solving, and were more likely to act without thinking in problem solving than students without PMS.

PMS symptoms are various and affect women not only physically but also psychologically, which can cause some limitations in daily life. Buddhabunyakan et al. found that PMS causes a lack of concentration, a lack of motivation, and lower personal or collaborative job performance in students (39). Similarly, in the study conducted by Sharma et al., it was found that students with PMS had a higher rate of school absenteeism and more concentration problems, and 25% of those who were employed had to leave their jobs due to the problems brought about by PMS (40). All these problems may negatively affect the problem-solving approaches of the students with PMS.

## **Limitations of the Study**

This study has certain limitations. First, the cross-sectional form of this study prevents any results from being determined in terms of causality. Prospective cohort studies are more reliable in terms of determining PMS and its risk factors. Second, the study was conducted at a single university; therefore, the results may not be generalizable to all young women. Third, the data were collected through the self-report method. Future studies may therefore be conducted through alternative methods, such as interviews, employed in a more detailed and complete manner.

## **Conclusion**

The results of this study indicate that PMS was a significant risk factor in terms of indecisiveness and

problem-solving inadequacy. Health care professionals who provide health education and health-promoting services have important roles in preventing and reducing the negative effects of PMS. Healthcare professionals should be aware of not only the physiological effects of PMS but also its effects on daily life. Thus, it is important for healthcare professionals to understand the relationship between the menstrual cycle, menstrual disorders, and their effects on daily life. A good understanding of the relationship between these variables will provide young women with more valuable information about their own situations.

**Ethics Committee Approval:** The ethical endorsement was received for the research from the Health Sciences Scientific Research and Publications Ethics Committee (Decision no: 2018/13-1).

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