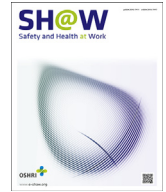




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Original Article

# Effect of Premenstrual Syndrome on Work-Related Quality of Life in Turkish Nurses

Hatice Kahyaoglu Sut<sup>1,\*</sup>, Elcin Mestogullari<sup>2</sup><sup>1</sup> Department of Obstetrics and Gynecology Nursing, Faculty of Health Sciences, Trakya University, Edirne, Turkey<sup>2</sup> Department of Obstetrics and Gynecology Nursing, Institute of Health Sciences, Trakya University, Edirne, Turkey

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## ABSTRACT

**Background:** Little is known about the effects of premenstrual syndrome (PMS) on work-related quality of life in nurses. We aimed to investigate the effect of PMS on work-related quality of life in Turkish nurses.

**Methods:** A total of 134 volunteer nurses were included in this cross-sectional study between January 2015 and March 2015. One hundred and thirty-four nurses completed a questionnaire regarding demographic data, the Premenstrual Syndrome Scale (PMSS), and the Work-Related Quality of Life Scale (WRQoL). The nurses were classified as having or not having premenstrual syndrome according to the PMSS.

**Results:** The average age was  $29.5 \pm 7.1$  years and the prevalence of PMS was 38.1%. The total score of PMSS was significantly negatively correlated with the overall score ( $r = -0.341$ ;  $p < 0.001$ ) and all subscale scores of the WRQoL and ranged from  $-0.207$  to  $-0.402$  ( $p < 0.05$  for all). All of the WRQoL subscale scores except stress at work ( $p = 0.179$ ) in nurses with PMS were significantly lower than those of nurses without PMS ( $p < 0.05$ ). The age ( $\beta = -0.258$ ;  $p = 0.021$ ) and PMSS total score ( $\beta = -0.314$ ;  $p < 0.001$ ) increment negatively; however, optimistic thinking ( $\beta = 0.228$ ;  $p = 0.008$ ) positively affected overall WRQoL score.

**Conclusion:** Nurses with PMS have decreased levels of work-related quality of life in their professional lives. Methods to help cope with cyclic premenstrual symptoms may be used, and as a result, productivity and work-related quality of life may increase.

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## 1. Introduction

Premenstrual syndrome (PMS) is characterized by physical and mental symptoms during the luteal phase of the menstrual cycle; however, symptoms improve rapidly with the onset of menstruation [1–3]. PMS is commonly seen in women of reproductive age and can be accompanied by emotional and physical symptoms [1]. The prevalence of PMS is approximately 20–32% of premenopausal women [4] and 30–40% in reproductive women [5]. One study using the PMS scale reported a 36.4% rate among nursing students [6]. PMS prevalence has also been reported to be 47.8% in a recently published meta-analysis [1]. PMS prevalence rates can vary due to

cultural characteristics, sample differences, and diagnostic methods.

PMS affects the daily lives of women and can deteriorate their quality of life and social skills [1]. The severity of PMS symptoms is associated with its duration in how it impairs the daily lives of women [1,7]. The physical symptoms of PMS, such as irritability and muscle, joint, back, and abdominal pain, are more prevalent than the mental symptoms [7]. These symptoms are cyclic; however, their severity and extent can vary [1]. PMS also negatively affects a woman's sleep quality [8]. Several scales are used to determine the level of severity as well as the diagnosis of PMS. The development of the Premenstrual Syndrome Scale (PMSS) was based on DSM-III

\* Corresponding author. Department of Obstetrics and Gynecology Nursing, Faculty of Health Sciences, Trakya University, Balkan Campus, 22030 Edirne, Turkey.  
E-mail address: [haticesut@yahoo.com](mailto:haticesut@yahoo.com) (H. Kahyaoglu Sut).

and DSM-IV-R, and is a reliable scale for measuring the severity of premenstrual symptoms [9].

Work-related quality of life can be described as the physical and mental perceptions of an employee about their working conditions and factors associated with the workplace. These conditions and factors include: working hours, salary, physical conditions, career possibilities, and interpersonal relationships [10]. A woman's quality of life is strongly affected by both her social life and her working life. However, quality of life measurements at work are difficult when using generic quality of life scales. The Work-Related Quality of Life Scale (WRQoL) was developed by Van Laar et al [11] for measuring work-related quality of life. The WRQoL scale can be used as a key performance indicator for workers with high levels of education [12].

The responsibilities of nurses in clinical practices are important. Stressful and heavy working conditions, occupational risks, and low job satisfaction decrease a nurse's job performance [13]. The International Council of Nurses [14] reported that unhealthy work environments reduce a nurse's performance; thus, they may plan to leave if their personal or professional requirements are not meeting their expectations. Nurses may have a greater tendency toward PMS due to their heavy and stressful work lives. The frequency of PMS in nurses, which can negatively affect the quality of work life, is reported at 25.1% [15].

Several studies have examined PMS; however, the relationship between PMS and work-related quality of life in nurses has not been studied. Therefore, we decided to examine this relationship to determine if PMS affects the personal and professional lives of nurses.

## 2. Materials and methods

### 2.1. Design and sample

Data were collected in a cross-sectional design between January 2015 and March 2015 in Edirne, Turkey. One hundred and thirty-four nurses who worked at Trakya University Medical Faculty Hospital, Edirne, Turkey, and who volunteered to participate in the study were included. However, nurses who did not volunteer for the study or those who were experiencing menopause were excluded. Participants completed a questionnaire that included demographic data, the PMSS scale, and WRQoL scale.

### 2.2. Ethical consideration

The Trakya University Scientific Research Ethic Committee approved this study (TUTF-BAEK 2014/214).

### 2.3. Data collection measurements

#### 2.3.1. PMSS

The PMSS, developed by Gençdoğan [9] in 2006, is based on the DSM-III and DSM-IV-R and is intended to measure the severity of premenstrual symptoms. It consists of 44 items on a 5-point Likert scale (1 = "never," 2 = "rarely," 3 = "sometimes," 4 = "very often," and 5 = "always") and nine subscales (depressive mood, anxiety, fatigue, irritability, depressive thoughts, pain, appetite changes, sleep changes, and swelling). Subscale scores are calculated as the sum of the items in the subscales. The PMSS total score is obtained from the sum of all nine subscales. The lowest PMSS score is 44 and the highest score is 220. More than 50% of the total PMSS scores (> 132) were classified as PMS positive. Higher PMSS scores indicate greater symptom severity during PMS [9].

#### 2.3.2. WRQoL

The WRQoL scale consists of 23 items on a 5-point Likert scale (from 1 = "strongly agree" to 5 = "strongly disagree") and six subscales that measure work-related quality of life. The subscale "job and career satisfaction" consists of six items (q1, q3, q8, q11, q18, and q20). The subscale "general wellbeing" also has six items (q4, q9, q10, q15, q17, and q21) and is related to happiness and life satisfaction. The subscale "home-work interface" consists of three items (q5, q6, and q14) and is related to issues of balancing family and work commitments. The subscale "stress at work" consists of two items (q7 and q19) related to under pressure at work. The subscale "control at work" consists of three items (q2, q12, and q23) related to being able to have control over decisions. The final subscale is "working conditions" and consists of three items (q13, q16, and q22) related to the physical working environment [11].

The validity and reliability of the Turkish version of the WRQoL was done by Duyan et al [16].

Three negative items (q7, q9, and q19) are in reversed coding before the calculation of the WRQoL subscale scores. Subscale scores are calculated by taking the mean of the subscale items. The overall WRQoL score is calculated by taking the mean of the six subscale scores [11]. Higher WRQoL scores indicate a higher work-related quality of life.

### 2.4. Statistical analysis

Demographic characteristics of patients were calculated as the mean  $\pm$  standard deviation, or  $n$  (%) of the total. Internal consistency of the PMSS and WRQoL scales were analyzed using a reliability analysis and Cronbach  $\alpha$  coefficients. Normal distribution of the PMSS and WRQoL subscale scores were tested using the One-Sample Kolmogorov-Smirnov test. Relationships between the PMSS and WRQoL subscale scores were analyzed using a Spearman correlation analysis. More than 50% of the total PMS scale scores (> 132) were classified as PMS positive. The subscale scores of the WRQoL scale between individuals with PMS or without PMS were compared using the Mann-Whitney  $U$  test due to the non-normal distribution. The effect of PMSS total score and covariates [age, body mass index (BMI), marital status, presence of a child, education, shift work, and life perspective] on overall WRQoL score were investigated using multiple regression analysis. Statistical analyses were done using SPSS version 20.0 statistical software (IBM SPSS Inc., Chicago, IL, USA). A  $p$  value < 0.05 was accepted as statistically significant.

## 3. Results

A total of 134 volunteer nurses responded to the survey. The mean age and BMI of the nurses were  $29.5 \pm 7.1$  years and  $23.4 \pm 3.9$  kg/m<sup>2</sup>, respectively. Of the 134 nurses, more than half (55.2%) were married, 43.3% had at least one child, 61.2% performed shift work, and the majority (83.6%) held an optimistic life perspective. Tea, coffee, smoking, and alcohol consumption rates were 90.3%, 86.6%, 30.6%, and 11.9%, respectively (Table 1).

Cronbach  $\alpha$  coefficients of the PMSS and WRQoL scales were 0.97 and 0.91, respectively. The mean PMSS total score was  $119.7 \pm 34.7$  (mean PMSS total score by average of items =  $2.72 \pm 0.78$ ), and the mean WRQoL score was  $2.7 \pm 1.1$ .

Correlations coefficients between WRQoL and PMSS are given in Table 2. The overall WRQoL score and PMSS total score were significantly correlated ( $r = -0.341$ ;  $p < 0.001$ ). When the PMSS total score increased overall WRQoL score decreased (Fig. 1). Furthermore, all subscale scores of the WRQoL were negatively correlated with PMSS total score ( $p < 0.05$ ). Considering the subscales, depressive thought was negatively correlated with all subscale scores of the WRQoL ( $p < 0.05$ ). Depressive mood was

**Table 1**  
Demographic characteristics of the nurses (N = 134)

	Mean ± SD or n (%)
Age (y)	29.5 ± 7.1
BMI (kg/m <sup>2</sup> )	23.4 ± 3.9
Marital status	
Married	74 (55.2)
Single	60 (44.8)
Presence of a child	
No	76 (56.7)
Yes	58 (43.3)
Education	
College degree	55 (41.0)
Bachelor or higher degree	79 (59.0)
Shift work	
No	52 (38.8)
Yes	82 (61.2)
Life perspective	
Pessimistic	22 (16.4)
Optimistic	112 (83.6)
Tea	
No	13 (9.7)
Yes	121 (90.3)
Coffee	
No	18 (13.4)
Yes	116 (86.6)
Smoking	
No	93 (69.4)
Yes	41 (30.6)
Alcohol	
No	118 (88.1)
Yes	16 (11.9)

BMI, body mass index; SD, standard deviation.

negatively correlated with all subscale scores of the WRQoL except control at work ( $p < 0.05$ ). Fatigue was negatively correlated with general well-being, home–work interface, stress at work, and working conditions ( $p < 0.05$ ). Sleep changes were negatively correlated with general well-being, home–work interface, stress at work, and control at work ( $p < 0.05$ ). Irritability and pain were negatively correlated with general well-being, home–work interface, and stress at work ( $p < 0.05$ ). Anxiety was negatively correlated with general well-being ( $p < 0.05$ ). Appetite changes were negatively correlated with home–work interface ( $p < 0.05$ ). However, the swelling was not significantly correlated with the overall score and all subscale scores of the WRQoL scale ( $p > 0.05$ ).

Comparisons of WRQoL subscale scores between those with and without PMS are shown in Table 3. The PMS rate was 38.1% among

**Table 2**  
Spearman correlation coefficients ( $r$ ) and statistical significance ( $p$ ) levels between the Premenstrual Syndrome Scale and Work-Related Quality of Life subscales

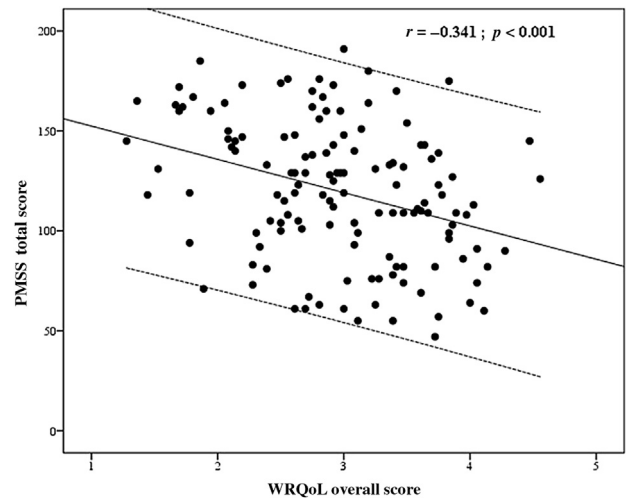
PMSS subscales	WRQoL subscales						Overall WRQoL score
	JCS	GWB	HWI	SAW	CAW	WCS	
Total	−0.207*	−0.402‡	−0.254†	−0.244†	−0.214*	−0.231†	−0.341‡
Depressive mood	−0.216*	−0.428‡	−0.174*	−0.207*	−0.159	−0.222*	−0.299‡
Anxiety	−0.140	−0.383‡	−0.138	−0.163	−0.159	−0.102	−0.235†
Fatigue	−0.113	−0.277†	−0.182*	−0.177*	−0.154	−0.191*	−0.253†
Irritability	−0.143	−0.294†	−0.170*	−0.267†	−0.163	−0.141	−0.256†
Depressive thoughts	−0.313‡	−0.447‡	−0.327‡	−0.205*	−0.289†	−0.327‡	−0.412‡
Pain	−0.080	−0.270†	−0.228†	−0.215*	−0.113	−0.148	−0.228†
Appetite changes	−0.105	−0.100	−0.172*	−0.164	−0.099	−0.165	−0.190*
Sleep changes	−0.146	−0.319‡	−0.229†	−0.189*	−0.202*	−0.144	−0.271†
Swelling	−0.070	−0.072	−0.158	−0.060	−0.146	−0.084	−0.149

\* $p < 0.05$ .

† $p < 0.01$ .

‡ $p < 0.001$ .

CAW, Control at work; GWB, general wellbeing; HWI, home–work interface; JCS, job career satisfaction; PMSS, Premenstrual Syndrome Scale; SAW, stress at work; WCS, working conditions; WRQoL, Work-Related Quality of Life.



**Fig. 1.** Relationship between the total Premenstrual Syndrome Scale score and the overall Work-Related Quality of Life Scale score (dotted lines indicate the 95% confidence interval). PMSS, Premenstrual Syndrome Scale; WRQoL, Work-Related Quality of Life Scale.

the nurses. All of the WRQoL subscale scores except stress at work ( $p = 0.179$ ) in nurses with PMS were significantly lower than in nurses without PMS ( $p < 0.05$ ).

The effect of the PMSS total score on overall WRQoL score was investigated controlling for covariates (i.e., age, BMI, marital status, child presence, education, shift work, and life perspective) using multiple regression analysis (Table 4). Among the variables (age, BMI, marital status, child presence, education, shift work, life perspective, and PMSS total score) that were entered into the multiple regression model, only three (age, life perspective, and PMSS total score) were found to be statistically significant in terms of overall WRQoL score. When age ( $\beta = -0.258$ ;  $p = 0.021$ ) and PMSS total score ( $\beta = -0.314$ ;  $p < 0.001$ ) increased, the overall WRQoL score decreased. However, optimistically minded nurses had higher overall WRQoL scores ( $\beta = 0.228$ ;  $p = 0.008$ ).

#### 4. Discussion

Relationships between PMS and work-related quality of life in nurses has not been previously studied. Therefore, we decided to examine this relationship to determine if PMS affects the personal

**Table 3**

Comparisons of Work-Related Quality of Life subscale scores between nurses with and without premenstrual syndrome

	PMS – (n = 83)	PMS + (n = 51)	p
JCS	3.3 ± 0.7	3.0 ± 0.8	0.016
GWB	3.3 ± 0.8	2.7 ± 0.8	< 0.001
HWI	3.1 ± 1.0	2.6 ± 1.0	0.006
SAW	2.8 ± 0.9	2.5 ± 1.1	0.179
CAW	3.4 ± 1.0	2.9 ± 1.1	0.016
WCS	2.9 ± 1.0	2.4 ± 1.0	0.013
Overall	3.1 ± 0.6	2.6 ± 0.7	0.001

CAW, control at work; GWB, general wellbeing; HWI, home–work interface; JCS, job career satisfaction; PMS, premenstrual syndrome; SAW, stress at work; WCS, working conditions.

and professional lives of nurses. PMS can affect a woman's social life, relationships with other people, work productivity, lifestyle, academic performance, and physical–emotional health [17]. A limitation of this study is that premenstrual symptoms and their effect on the quality of work life in nurses can vary due to cultural differences; therefore, our results may be specific to Turkish nurses.

Of the nurses in this study, 38.1% had a PMS diagnosis according to the PMSS. In a study conducted on Thai nurses, the PMS prevalence was reported as 25.1% [15]. PMS incidence in women working in health care has been reported to be 20.1% [18]. In a recently published meta-analysis, the PMS prevalence was reported as 47.8% for all studied groups; however, rates varied from 12% (for France) to 98% (for Iran) [1]. This suggests that PMS prevalence varies from country to country. These differences arise from the number and structure of samples, cultural differences, or variations in diagnostic methods. Also, emotional and physical abuse in early life affects PMS prevalence [19].

We showed that the presence of PMS in nurses reduced work-related and individual personal scores of nurses. Nurses with PMS have decreased job career satisfaction levels, feel less good, have more issues balancing family and work commitments, have more stress at work, are less involved in decisions that affect themselves at work, and are less happy about their working conditions. PMS increases absenteeism, reduces work productivity, impairs household activities, and influences negatively social relationships [20]. PMS leads to deterioration in interpersonal relations or workplace functions among at least 3–8% of women of reproductive age [21]. Also, PMS decreases the social–family life and work performance in

**Table 4**

Effect of risk factors on overall Work-Related Quality of Life score using a multiple regression model

Covariates	Type of covariates	Standardized coefficients* (β)	t	p
Age (y)	Numeric	–0.258	–2.346	0.021
BMI (kg/m <sup>2</sup> )	Numeric	0.133	1.475	0.143
Marital status	0: Single; 1: Married	–0.066	–0.568	0.571
Presence of a child	0: None; 1: Yes	0.036	0.276	0.783
Education	0: College or less degree 1: Bachelor or higher degree	–0.103	–1.290	0.199
Shift work	0: No; 1: Yes	–0.153	–1.830	0.070
Life perspective	0: Pessimistic; 1: Optimistic	0.228	2.682	0.008
PMSS total score	Numeric	–0.314	–3.787	<0.001

\* Adjusted R<sup>2</sup> = 0.208.

BMI, body mass index; PMSS, Premenstrual Syndrome Scale.

women [2]. It increases anxiety, tension, and proneness to conflict, and ultimately, these symptoms decrease work performance and quality of life [22]. Borenstein et al [23] reported a greater number of lost workdays due to health reasons and a decrease in work productivity in women with PMS. Symptoms of PMS significantly reduce quality of life and occupational productivity in women [23,24]. Of symptomatic health-care workers, 70.3% reported impaired work performance [18]. A PMS diagnosis adds US\$4,333 per patient to the average annual indirect costs, which include missed work days and lost productivity [25]. Namavar Jahromi et al [26] reports that work stress may exacerbate PMS [26], and consistent with this, our results show that nurses with PMS feel more stress at work. While a statistically significant difference could not be obtained within our sample structure or regional differences, nevertheless, it shows that nurses with PMS often feel under pressure at work. In consideration of our findings, we can say that nurses with PMS have poor satisfaction from their career opportunities, poor life satisfaction, decreased happiness, more stress at work, poor balance between work and family, decreased involvement in decisions affecting their life, and poor satisfaction from their working conditions.

Cheng et al [27] reported that an impaired perception of daily functions is due to PMS and is associated with work performance. Working conditions can also affect work-related quality of life [28]. Our bivariate correlation analysis showed that when the PMSS total score increased, work-related quality of life and productivity in nurses reduced. Furthermore, depressive thoughts and mood subscales of PMSS were negatively correlated with the overall score and almost all-subscale scores of the WRQoL. This showed that depressive thoughts and mood significantly reduced work-related quality of life and productivity in nurses. Pain, perceived stress, perceived general health, and absence from work were reported as associated with the severity of premenstrual symptoms [29]. It was reported that more than half of women took analgesics to alleviate premenstrual symptoms [29]. However, an experimental study reported that progressive muscular relaxation therapy performed twice a week for 1 month helped reduce the severity of premenstrual symptoms by decreasing anxiety and depression [30]. Acupuncture and hand moxibustion therapy may reduce the severity of premenstrual symptoms [31]. These therapies may help nurses to cope with cyclic premenstrual symptoms, and, as a result, productivity and work-related quality of life may increase.

The results of the multiple regression analysis showed that age, life perspective, and PMSS total score effect the overall WRQoL score. The age increment in nurses decreased with the quality of work life. It has been reported that premenstrual symptoms are positively correlated with age [29], which can be tied to decreases in nurses' work-related quality of life. Our findings show that an optimistic life perspective increases work-related quality of life. Consistent with our findings, it was reported that premenstrual symptoms positively correlate with perceptions of health in general [29]. Optimistically minded individuals commonly have increased quality of work life, thus we can surmise that this relationship follows for nurses. In conclusion, when we controlled for covariates, the PMSS total score was negatively correlated with the overall WRQoL score. This shows that when the severity of premenstrual symptoms increases, work-related quality of life decreases in Turkish nurses.

PMS is a major health problem for nurses that negatively affects work-related quality of life and the compatibility of nurses in working with other health care professionals. Distractibility and irritability in clinical nursing practices, which may occur due to PMS, may cause incorrect applications and irreparable health outcomes. PMS also negatively affects a nurse's patient communication and care, which in turn threatens patients' safety. Two



experimental studies have shown that progressive muscular relaxation therapy [30], acupuncture, and hand moxibustion therapy [31] can alleviate premenstrual symptoms. Therefore, these therapies and self-awareness approaches that may induce optimistic thinking may help nurses cope with the cyclic premenstrual symptoms and, as a result, productivity and work-related quality of life may increase.

### Conflicts of interest

The authors declare no conflicts of interest.

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