

## GEBELERDE KOVİD SALGINI SIRASINDA STRES, UYKU, FİZİKSEL AKTİVİTE VE AĞRI DÜZEYİ: TANIMLAYICI ÇALIŞMA

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### Öz

COVID-19 pandemisi, hamilelikle ilgili stres, uyku, fiziksel aktivite (FA) ve ağrı yoğunluğunda değişikliklere neden olabilir. Çalışma, pandemi sırasında izolasyonu sağlamak için mümkün olduğunca evde kalmaları önerilen hamile kadınların algılanan stres, uyku kalitesi, FA ve ağrı yoğunluğunu araştırmayı amaçlamaktadır. Çalışmaya Nisan 2020 ve Mayıs 2020 arasında 149 hamile kadın dahil edilmiştir. Demografik veriler kaydedilmiş; Algılanan Stres Ölçeği (ASÖ), Pittsburgh Uyku Kalitesi İndeksi (PUKİ), Uluslararası Fiziksel Aktivite Anketi-Kısa Form (IPAQ-kısa) ve Sayısal Ağrı Derecelendirme Ölçeği (SADÖ) uygulanmıştır. Sosyal izolasyon süresine göre katılımcıların %79,2'si 21 günden fazla sosyal izolasyonda bulunmuştur. Katılımcıların %65,8'inin bildirdiği kaygı düzeyi şiddetlidir. Ortalama ASÖ skoru ( $\pm$ SD) 26.98 $\pm$ 8.26, PUKİ skoru 6.14 $\pm$ 2.87, IPAQ-kısa skoru 466.1 $\pm$ 1421.28 ve SADÖ skoru 4.42 $\pm$ 2.65'dir. Katılımcılar trimestere göre sınıflandırılıp karşılaştırıldığında, ASÖ, PUKİ, IPAQ-kısa ve SADÖ skorlarında istatistiksel anlamlılık bulunmamıştır ( $p>0.05$ ). Hem ASÖ-PUKİ skorları arasında ( $r=0.291$ ,  $p\leq 0.001$ ), hem de SADÖ ve PUKİ skorları ( $r=0.198$ ,  $p=0.016$ ) arasında korelasyon düşük bulunmuştur. Sonuç olarak, pandemi gebeler orta düzeyde stres düzeyi, kötü uyku kalitesi, çok düşük FA düzeyi ve orta düzeyde ağrı şiddeti bildirmiştir.

**Anahtar Kelimeler:** Kaygı, Koronavirüs, Maternal Stres, Pandemi.

## THE STRESS, SLEEP, PHYSICAL ACTIVITY, AND PAIN LEVEL DURING THE COVID OUTBREAK AMONG THE PREGNANT WOMEN: A DESCRIPTIVE STUDY

### Abstract

COVID-19 pandemic may lead to changes in stress, sleep, physical activity (PA), and pain intensity related to the pregnancy. The study aimed to investigate the perceived stress, quality of sleep, PA, and pain intensity of pregnant women who were advised to stay at home as much as they could to provide isolation during the pandemic. The study included 149 pregnant women between April and May 2020. Demographics were recorded; Perceived-Stress Scale (PSS), Pittsburgh Sleep Quality Index (PSQI), International Physical Activity Questionnaire-Short Form (IPAQ-SF), and Numerical Pain Rating Scale (NPRS) were performed. According to social isolation duration, 79.2% of the participants were in social isolation for more than 21 days. Self-reported anxiety level was severe for 65.8% of participants. The mean PSS score ( $\pm$ SD) was 26.98 $\pm$ 8.26, PSQI score was 6.14 $\pm$ 2.87, IPAQ-SF score was 466.1 $\pm$ 1421.28, and NPRS score was 4.42 $\pm$ 2.65. When the participants were classified and compared according to the trimester, no statistical significance was found in PSS, PSQI, IPAQ-SF, and NPRS scores ( $p>0.05$ ). The correlation was low between PSS-PSQI scores ( $r=0.291$ ,  $p=0.001$ ); NPRS and PSQI scores ( $r=0.198$ ,  $p=0.016$ ). As a conclusion, pregnant women reported moderate stress level, poor sleep quality, very low PA level, and moderate pain intensity in the pandemic.

**Keywords:** Anxiety, Coronavirus, Maternal Stress, Pandemic.

## 1. INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease and the rate of transmission of this disease is faster than other types of viruses (1). After the first case was detected, the government enforced the lockdown measures on the entire national territory to reduce interrelations through social isolation in Turkey (2). The protective measures were implemented to ensure social distance and restore community mitigation; restaurants, shopping malls, universities, and schools were closed, social events were canceled, a curfew was imposed for some selected age groups in Turkey (3).

Pneumonia caused by COVID-19 is associated with mortality and morbidity (4). Although there is little evidence on the effects of coronavirus disease on pregnant women, significant effects of previous infections on pregnant women at risk of complications have been demonstrated in the literature (5). Therefore, like other people, pregnant women should take the same precautions.

Social distancing and isolation are necessary for protection from COVID-19 and public health. But it causes rise community anxiety (6). The increased home time spent due to social isolation and the decrease in clinic/hospital visits of pregnant women due to the transmission rate of COVID-19 cases may also harm the pregnant's stress levels. Moreover, the increased infection risk during hospital/clinical visits may be another reason for increased stress in pregnant women. It can affect the mental health of the pregnant (7).

Hormonal changes, pregnancy-related pain, nocturia, leg cramps, or an increase in diaphragmatic pressure cause a decrease in sleep quality during pregnancy (8). Additionally, previous studies have shown that infectious disease outbreaks can impair people's physical health and increase their stress, anxiety, and depression levels, and these negative impacts can affect sleep (9).

It has been reported that doing physical activity (PA) is beneficial for the fetus and the pregnant woman (10). Indoor or outdoor activities that can be done individually or in groups are recommended during pregnancy (11). Since doing group and outdoor activities are restricted due to restrictions and social isolation, it should be questioned how the PA levels of pregnant women are affected.

In this study, which was designed to answer the question of what was the perceived stress level, sleep quality, PA, and pain of pregnant women during the coronavirus pandemic, we assumed that the stress level during pregnancy would increase, and the sleep quality might be adversely affected since their lifestyle was affected by the pandemic. In addition, as the PA level of pregnant women decreases due to restrictions, there may be an increase in the severity of pregnancy-related pain. This study aimed to determine perceived stress level, quality of sleep, PA, and pain of pregnant women during the coronavirus outbreak.

## 2. MATERIALS AND METHODS

### 2.1. Study Design and Participants

This cross-sectional study was conducted between April 2020 and May 2020 and approved by Istanbul Kultur University Ethics Committee (2020.15) and registered to clinical trials (NCT-04336787). All patients received informed consent. The research protocol was conducted following the Declaration of Helsinki.

The sample size was calculated as 142 participants considering  $d$  (precision) = 0.2,  $\alpha = 0.05$ ,  $1 - \beta = 0.80$ . In the end, 149 pregnant women were studied. Participants who live in urban areas and have internet access and respondents posting invitations through e-mail, Facebook, Instagram, WhatsApp, etc., included in the study. Pregnant individuals aged 18-45 years and who volunteered to participate were included. Participants were excluded if they had high-risk pregnancies (defined as

a fetal or maternal factor that adversely affects pregnancy) (12), were diagnosed with a sleep disorder, had a history of injury/surgery (last one month), and could not communicate in the native language.

## 2.2. Outcome Measurements

The self-administered questionnaires were applied via an online form. Before proceeding to the questionnaires, research information (the study's objectives, names, contacts, the ethics committee approval, inclusion, and exclusion criteria) was given. Participants were confirmed that voluntarily participate in the study and approved that they met these criteria. Then the evaluation was advanced to the questionnaires (demographic information survey, Perceived Stress Scale (PSS), Pittsburgh-Sleep Quality Index (PSQI), International Physical Activity Questionnaire-Short Form (IPAQ-SF), and The Numeric Pain Rating Scale (NPRS)). The questionnaires were completed only once by each participant.

The *Personal Data Form* is a simple, self-report tool to identify essential demographic and personal data which is created by researchers. A survey was administered with questions about the sociodemographic characteristics, the number of children, pregnancy duration (weeks), and the effects of social isolation on a birth schedule, pregnancy checkup routines, exercise habits, pain localization, and the self-reported anxiety level (with a 5-item Likert scale).

The *Perceived Stress Scale* was published in 1983 by Cohen et al. to evaluate the person's perceived stress level in the last month. It is a valid tool for assessing maternal stress during pregnancy (13). It has 14 items in a 5-point on Likert type (4: very often, 0: never) scale. A high score indicates high perceived stress (range 0-56). Turkish version was used in the study (Cronbach alpha=0.84, test-retest reliability = 0.87) (14).

The *Pittsburgh Sleep Quality Index* was designed to collect information about the subjective nature of people's sleep habits by Buysse et al. in 1989. It is used to evaluate sleep quality over the past 1 month. It consists of 19 questions to be rated by evaluating the seven domains—each component's scores ranging from 0 to 3 points on the Likert scale ( $\geq 5$  indicates poor sleep quality). The PSQI has good construct validity and reliability for assessing sleep quality among pregnant women (15). The PSQI-Turkish version was used in the study (Cronbach alpha=0.84, test-retest reliability = 0.93–0.98) (16).

The *International Physical Activity Questionnaire – Short Form* was developed by an International Consensus Group and proved as a valid method to assess the participants' PA levels in 2003. It has since become the most widely used physical activity questionnaire. It includes seven items (assesses the activity type, frequency-days, and duration-hours) of various activities. PA scores are estimated by the calculated total Metabolic Equivalent Task (MET). The score calculation includes the sum of duration and frequency of high-level (8 METs), moderate-level (6 METs), and mild-level activity (3 METs). The scale was validated for pregnant (17) and the Turkish version is available (Concurrent validity=0.66, test-retest reliability = 0.69) (18).

The *Numerical-Pain Rating Scale* was used to assess perceived pain intensity. It is a self-reported, 11-point scale that is easy to use and administered in short time duration. The participants were asked to rate the pain intensity and circle the number between 0 (no pain at all) and 10 (the worst pain ever). The NRPS was reported as a valid tool (cronbach alpha=0.88, test-retest reliability = 0.67 – 0.96) (19).

## 2.3. Statistical Analysis

The Statistical Package for the Social Sciences 24.0 (SPSS Inc., Chicago, USA) program was used for analyses. Descriptive statistics were given. The quantitative variables' distribution was examined. According to trimesters, the participants were divided into three groups, and one-way ANOVA was used for PSS and PSQI; the Kruskal Wallis test was used for IPAQ-SF and NPRS. The

normality of data distribution was tested using the Shapiro-Wilk test. The data were not normally distributed, thus nonparametric tests were used for analysis. To determine the relationship between the variables, the correlation coefficient was calculated. The significance level was  $p < 0.05$ .

### 3. RESULTS

Demographic information of 149 pregnant women who answered the questionnaires was recorded (Table 1). Additionally, the education level, smoking rate, and alcohol consumption rate were questioned. According to the education level query, 81.8% of the participants had a bachelor's or master's degree. The smoking rate was 7.4%, and the alcohol consumption rate was 4% during pregnancy.

**Table 1. Demographic Characteristics of Pregnant Women**

	Mean $\pm$ SD	
	Median (min-max)	
Age (year)	30.9 $\pm$ 4.7 31 (21-44)	
Weight (kg)	69.5 $\pm$ 11.2 67 (52-113)	
Height (cm)	164.0 $\pm$ 4.9 161.5 (152-186)	
Body Mass Index (kg/m <sup>2</sup> )	25.9 $\pm$ 4.3 24.57 (19.10-43.06)	
Gestational age (week)	26.0 $\pm$ 5.7 26 (5-41)	
	<b>N (%)</b>	
Trimester	1 <sup>st</sup> Trimester	26 (17.4)
	2 <sup>nd</sup> Trimester	63 (42.3)
	3 <sup>rd</sup> Trimester	60 (40.3)
Treatment before pregnancy	Yes	9 (6.0)
	No	140 (94.0)
History of miscarriage	Yes	26 (17.4)
	No	123 (82.6)
Number of children	First	96 (64.4)
	More than one child	53 (35.6)

Min: Minimum; Max: Maximum; SD: Standard deviation

Information about participants' days of social isolation, working status, general health status, self-reported anxiety level, and pain region characteristics is given in Table 2. Participants' pain presence, pain intensity, pain region, and PA level change were also examined. During the pandemic period, 28.2% of the participants reported pain, and 15.4% reported increased pain intensity. The most reported pain region was the back-lower back (55.4%). And 81.9% of participants reported decreased PA during the outbreak period. All the participants were also questioned about the changes in pregnancy checkup routines and birth plans. The pregnancy checkup routines were interrupted (64.4%), and birth schedules were considered to change (22.1%) in the pandemic.

**Table 2. Participants' Days of Social Isolation, Working Status, General Health Status, Self-Reported Anxiety Level, and Pain Region Characteristics**

	N (%)	
Days of social isolation	>21	118 (79.2)
	14-21	18 (12.1)
	7-14	4 (2.7)
	0-7	9 (6.0)
Home-office working	Yes	43 (28.9)
	No	54 (36.2)
	Not working	52 (34.9)

<b>General health status</b>	Poor	1 (0.7)
	Moderate	37 (24.8)
	Good	88 (59.1)
	Very good	23 (15.4)
<b>Self-reported anxiety level</b>	None	9 (6.0)
	Mild	9 (6.0)
	Moderate	33 (22.2)
	High	45 (30.2)
	Extreme	53 (35.6)
<b>Pain Region</b>	Back-low back pain	67 (55.4)
	Head-neck pain	22 (18.1)
	Abdominal-groin pain	15 (12.4)
	Lower extremity	12 (9.9)
	Upper extremity	5 (4.2)

Participants' PSS, PSQI, IPAQ-SF, and NPRS scores were given in Table 3. The participants also were separated into three groups according to trimesters. There was no significance in PSS, PSQI, IPAQ-SF, and NPRS scores ( $p>0.05$ ) between trimesters (Table 3). The PSS scores and PSQI scores ( $r=0.291$ ,  $p\leq 0.001$ ), and NPRS and PSQI scores were low correlated ( $r=0.198$ ,  $p=0.016$ ) (Table 4).

**Table 2. PSS, PSQI, IPAQ-SF, and NPRS Scores of the Participants and Comparison of the Trimesters**

	PSS	PSQI	IPAQ-SF	NPRS
	(Mean±SD) Median (min-max)	(Mean±SD) Median (min-max)	(Mean±SD) Median (min-max)	(Mean±SD) Median (min-max)
<b>All participants</b>	26.98±8.26 27 (2-49)	6.14±2.87 6 (0-15)	466.1±1421.28 159 (0-15756)	4.42±2.65 5 (0-10)
<b>Trimester (n)</b>				
<b>1<sup>st</sup> Trimester (26)</b>	26.73±8.28 26.5 (10-43)	5.34±2.63 5 (0-11)	311.02±431.47 115.5 (0-1450)	3.88±2.7 4 (0-8)
<b>2<sup>nd</sup> Trimester (63)</b>	27.22±9.32 27 (2-49)	6.52±2.5 7 (2-13)	630.85±2094.39 160 (0-15756)	4.3±2.86 5 (0-10)
<b>3<sup>rd</sup> Trimester (60)</b>	26.85±7.12 28 (10-41)	6.1±3.27 6 (1-15)	360.3±572.6 195.5 (0-3306)	4.8±2.39 5 (0-10)
<b>Analysis of variance</b>				
F(a) / $\chi^2$ (b)	0.04(a)	1.57(a)	0.29(b)	1.57(b)
p	0.95	0.21	0.86	0.45

PSS: Perceived Stress Scale; PSQI: Pittsburgh Sleep Quality Index; IPAQ-SF: International Physical Activity Questionnaire-Short Form; NPRS: Numeric Pain Rating Scale; min: minimum; max: maximum; SD: standard deviation;  $p<0.05$ \* (a): ANOVA; (b): Kruskal Wallis

**Table 3. Correlation of Perceived Stress, Sleep Quality, Physical Activity Level, and Pain Intensity**

Scale	PSS cc; p	PSQI cc; p	IPAQ-SF cc; p	NRPS cc; p
PSS	1.00			
PSQI	0.291; <0.001*	1.00		
IPAQ-SF	-0.055; 0.502	-0.077; 0.351	1.00	
NPRS	0.103; 0.213	0.198; 0.016*	0.009; 0.911	1.00

PSS: Perceived Stress Scale; PSQI: Pittsburgh Sleep Quality Index; IPAQ-SF: International Physical Activity Questionnaire-Short Form; NPRS: Numeric Pain Rating Scale; cc: Spearman correlation coefficient;  $p<0.05$ \*

#### 4. DISCUSSION

Results of the current study indicated that self-reported anxiety level was severe in more than half of the participants, the stress level of pregnant women was moderate, average scores of PSQI were below the cut-off value for poor sleep quality, participants had very low IPAQ-SF scores, and

reported moderate pain intensity in the pandemic. There is no significant difference in stress, sleep quality, PA, and pain intensity compared with a trimester. There was a low correlation between the quality of sleep and stress and pain intensity.

It has been documented that more than 43% of community-dwelling adults were affected by the early impact of the pandemic and reported any clinically relevant anxiety/depression (20). Of course, a rapidly changing context due to the pandemic can also be expected to affect pregnant women. The uncertainty they may face during the labor process may lead to increased anxiety among pregnant women. Although 74.5% of the participants reported good/very good general health status in the current study, 87.8% of them claimed moderate or above self-reported anxiety levels. Although clinical anxiety level was not evaluated in this study, it can be suggested that the COVID-19 outbreak is negatively associated with the anxiety level of pregnant women.

Pregnancy is a new physiological condition that requires compliance and may lead to increased stress level (21). Pregnant women's PSS-14 scores before the pandemic were reported as 22-23 points (22, 23). Moreover, the rate of transmission of COVID-19 and home isolation may also negatively impact pregnant women's stress levels. Alan et al. (2020) reported the mean PSS-14 score as  $27.78 \pm 5.63$  in the early period of the pandemic in pregnant women with younger mean age ( $29.65 \pm 4.79$ ) (24). Similar to this study, the stress level of pregnant women was found moderate (26.9) in the current study. Stress levels may be related to the thought that the pandemic period affects their daily lives. In line with this, 64.4 % of our participants reported that their pregnancy checkup routines were interrupted, and about a quarter of the participants are considering changing their birth schedule. In addition, the stress level of pregnant women was not significant between trimesters in the current study. Previous studies have shown that social support is significantly related to stress reduction during pregnancy (25). The decrease in social support for all pregnant women due to social isolation may explain the lack of significance between trimesters.

Sleep quality changes with pregnancy because of uncomfortable sleeping positions, urination, body aches, etc. (26, 27). In addition, the pandemic has caused an increase in perceived stress and a decrease in sleep quality (28). Alan et al. reported poor sleep quality in pregnancy during the COVID-19 pandemic (24). In our study also, pregnant women stated poor sleep quality. However, in a meta-analysis published before the pandemic, the average PSQI score in pregnancy was reported as 6.07, which is very similar to our result (6.14) (26). Based on these findings, it is not possible to say that the pandemic is directly related to sleep quality. Sedov et al. (2018) reported that sleep quality and the month of pregnancy were related. The poor sleep quality was reported during third trimester compared to the second trimester (27). In the current study, although PSQI scores were higher in the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters, sleep quality was poor in all three trimesters ( $PSQI > 5$ ), and there was no significant difference. There is a need for study designs that will reveal the causality of this finding.

PA during the outbreak may contribute to maintaining aerobic capacity (29). However, it is known that PA levels decreased during the COVID-19 pandemic (30). Even in the pre-pandemic period, 1/3 of the world's population did not meet the minimum recommendations for PA, while this rate increased with the pandemic (31). Staying home and social isolation caused a radical change in individual lifestyles. In our study, it was observed that the PA level of pregnant women was low. No linear decrease in PA level was observed with the increase in trimesters. It was observed that the PA level increased between the first and second trimesters and decreased between the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters. This may be explained by the inability of pregnant women to exercise due to nausea and fatigue in the first trimester, the increase in compliance and the feeling of more energy in the second trimester, and the re-occurrence of some restrictions due to postural problems and fetal growth in the third trimester (29, 32). Although the IPAQ-SF scores were higher in the second, the PA level was still low. Low PA levels may be related to the inability to perform PA's such as walking during the pandemic.

The most frequent musculoskeletal problems were reported as low back and back pain during pregnancy (33). In studies related to pain in the lower back and pelvic girdle in pregnant women and using NPRS for assessing pain, the intensity was reported above 5 (34, 35). In our study, similar to the literature, the most prevalent pain region was the low back - back, and the average pain intensity was found 5/10. It has been reported that the pain intensity is most in the third trimester (33). Also, no significance was found in our study, although the pain intensity scores worsened with the increase in the trimester. It may be thought that the pain intensity would have increased during the pandemic period, but our findings showed similar results to the pre-pandemic period. The cause of musculoskeletal pain during pregnancy is mostly mechanical stress (36). It is caused especially by the alternation of the center of gravity and its effects on the body. With the social isolation period, pregnant women may have had the opportunity to rest more and reduce these mechanical stresses.

We examined the correlation between stress level, quality of sleep, PA, and pain level. There was a low positive correlation between stress scores and sleep quality scores. In the literature, it was also stated stress correlates with sleep quality during pregnancy (37). We also found a low positive correlation between pain NPRS and PSQI scores. Although these findings make us think that sleep poor quality may be related to increased perceived stress level and pain intensity, it is impossible to understand causality with cross-sectional data.

Despite the timely assessment of women during pregnancy with valid assessment questionnaires and providing preliminary data for the COVID-19 pandemic, the absence of pre-pandemic data of the participants, using the self-reported method, the absence of assessment methods done by therapist because of the social-isolation procedures, inability to determine causality due to the cross-sectional design can be taken as limitations.

## 5. CONCLUSION

Based on the current data, it was concluded that the outbreak was associated with increased perceived stress and decreased PA levels in pregnant women. The sleep quality and pain intensity were similar to the pre-pandemic period. The findings of this study are important to highlight the need to support pregnant women to continue to be active during stressful times, such as the pandemic, because PA itself is a strategy to cope with anxiety, stress, and poor sleep.

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