Ordu Üniversitesi Hemşirelik Çalışmaları Dergisi
Ordu University Journal of Nursing Studies

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

Araştırma Makalesi/ Research Article

The Relationship Between Nurses' COVID-19 Risk Perceptions, Anxiety Levels and Sleep Quality

Hemşirelerin COVID-19 Risk Algıları ve Anksiyete Düzeyi ile Uyku Kalitesi İlişkisi

Nülüfer Erbil[1] Fatma Aksoy[2] Gizem Yıldız[1] Hilal Gül Boyraz[1]

[1]Department of Obstetrics and Gynecologic Nursing, Faculty of Health Sciences, Ordu University, Ordu, TÜRKİYE
[2]Department of Nursing Fundamentals, Faculty of Health Sciences, Ordu University, Ordu, TÜRKİYE

Geliş tarihi/ Date of receipt: 03/08/2023 **Kabul tarihi/ Date of acceptance:** 08/10/2023
 Published online: 04/06/2024

ABSTRACT

Objective: This study was conducted to determine the relationship between COVID-19 risk perceptions, anxiety levels, and the sleep quality of nurses.

Methods: The sample of the descriptive and correlational study consisted of 248 nurses. The data were collected face-to-face using a Questionnaire form, the COVID-19 Perceived Risk Scale, the Coronavirus Anxiety Scale, and the Pittsburg Sleep Quality Index between July 1, 2021, and December 29, 2021. Data were evaluated with descriptive statistics, Mann-Whitney U and Kruskal Wallis test, Spearman correlation analysis test, and linear regression analysis.

Results: The mean score was 29.73±6.66 for the COVID-19 Perceived Risk Scale, 4.22±0.28 for the Coronavirus Anxiety Scale score, and 8.30±3.3 for the Pittsburg Sleep Quality Index. A moderate positive correlation was found between the participants' Pittsburg Sleep Quality Index scores and the Coronavirus Anxiety Scale total score ($r=0.300$, $p<0.01$), and a weak positive correlation was found between the Pittsburg Sleep Quality Index and the COVID-19 Perceived Risk Scale total score ($r=0.157$, $p<0.05$).

Conclusions: It is concluded that COVID-19 risk perception and coronavirus anxiety had an adverse effect on sleep quality.

Keywords: Anxiety, COVID-19, nurses, sleep quality

ÖZ

Amaç: Bu çalışma, hemşirelerin COVID-19 risk algıları, anksiyete düzeyleri ve uyku kalitesi arasındaki ilişkiyi belirlemek amacıyla yapıldı.

Yöntem: Tanımlayıcı ve ilişki arayıcı nitelikte olan araştırmanın örneklemini 248 hemşire oluşturdu. Veriler, 1 Temmuz 2021-29 Aralık 2021 tarihleri arasında Anket formu, COVID-19 Algılanan Risk Ölçeği, Koronavirüs Anksiyete Ölçeği ve Pittsburg Uyku Kalitesi İndeksi kullanılarak yüz yüze toplandı. Veriler tanımlayıcı istatistikler, Mann-Whitney U ve Kruskal Wallis testi, Spearman korelasyon analizi testi ve doğrusal regresyon analizi ile değerlendirildi.

Bulgular: COVID-19 Algılanan Risk Ölçeği ortalama puanı 29.73±6.66, Koronavirüs Anksiyete Ölçeği ortalama puanı 4.22±4.53 ve Pittsburg Uyku Kalitesi İndeksi ortalama puanı 8.30±3.3'tür. Kadınların Pittsburg Uyku Kalitesi İndeksi puanları ile Koronavirüs Anksiyete Ölçeği toplam puanı arasında orta düzeyde pozitif korelasyon ($r=0.300$, $p<0.01$), Pittsburg Uyku Kalitesi İndeksi ile COVID-19 Algılanan Risk Ölçeği toplam puanı arasında zayıf pozitif korelasyon ($r=0.157$, $p<0.05$) bulundu.

Sonuç: Çalışma sonucunda COVID-19 risk algısı ve koronavirüs anksiyetesinin uyku kalitesine olumsuz etkisi olduğu belirlendi.

Anahtar Kelimeler: Anksiyete, COVID-19, hemşireler, uyku kalitesi

ORCID IDs of the authors: NE: 0000-0003-3586-6237; FA: 0000-0002-5023-4468; GY: 0000-0003-3496-4791; HGB: 0000-0003-1177-4004
Sorumlu yazar/Corresponding author: RN, MSc, Research Assistant, Fatma AKSOY
Department of Nursing Fundamentals Faculty of Health Sciences, Ordu University, Ordu, TÜRKİYE
e-posta/e-mail: fatmaaksoy@odu.edu.tr
Atıf/Citation: Erbil N, Aksoy F, Yıldız G, Boyraz HG. (2024). The relationship between nurses' COVID-19 risk perceptions, anxiety levels and sleep quality. Ordu Üniversitesi Hemşirelik Çalışmaları Dergisi, 7(2), 387-398. DOI:10.38108/ouhcd.1337076

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

Introduction

The COVID-19 pandemic, one of the most serious outbreaks of the century, has spread rapidly throughout the world (WHO, 2020b). The global pandemic has brought about changes in sectors such as tourism, education, economy, health, and daily life (Duygulu et al., 2020; Yücesan and Özkan, 2020).

Although many sectors like tourism, education, and the economy are affected by the pandemic worldwide, health is the most affected sector (Yücesan and Özkan, 2020). The high transmission rate of the pandemic has increased the number of contacts and hospitalized patients in a short time (Duygulu et al., 2020; Mo et al., 2020; WHO, 2020a), and healthcare professionals have taken critical responsibilities on the front line against the pandemic (Duygulu et al., 2020). Healthcare professionals involved in the care and treatment of COVID-19 patients have experienced physical, mental, social, and spiritual burnout due to long working hours, feeling at risk, and worrying about infecting family members (Alenazi et al., 2020; Duygulu et al., 2020).

During the pandemic period, nurses who had difficulty adapting to the changing working schedule and increasing risk environment experienced a feeling of stress, anxiety, fear, and pressure (Alenazi et al., 2020; Mo et al., 2020; Rodriguez-Menéndez et al., 2021). Actively working nurses were separated from their family members and children due to the struggle with the pandemic, and their concern of transmitting the virus resulted in stress, anxiety, and sleep problems (Alenazi et al., 2020; Rodriguez-Menéndez et al., 2021).

Changes in the working hours of healthcare professionals during the pandemic have caused sleep problems (Asi Karakaş et al., 2017; Cheval et al., 2018; Rodriguez-Menéndez et al., 2021). Insufficient sleep increases attention deficit, inability to focus, the possibility of making mistakes, and the perceived risk ratio (Cheval et al., 2018; Rodriguez-Menéndez et al., 2021).

Problems like anxiety, stress, insomnia, and burnout are more common among healthcare workers than in the general population (Gupta and Pandi-Perumal, 2020; Mo et al., 2020). Anxiety and insomnia are common among healthcare workers during the pandemic period (Gupta and Pandi-Perumal, 2020), and they perceive the risk in their work environment to be higher due to mental and psychological effects (Kang et al., 2020; Mo et al., 2020).

During the pandemic, the intense working hours of nurses and their struggle against it caused physical and psychological fatigue. They experienced stress, anxiety, and changes in their social life and sleep quality.

Aim

This study aimed to examine the relationship between nurses' COVID-19 risk perceptions, coronavirus anxiety levels, and sleep quality.

Research Questions:

1. What is the level of coronavirus anxiety in nurses?
2. What is the level of COVID-19 risk perception among nurses?
3. What is the level of sleep quality in nurses?
4. Is there a relationship between nurses' perceived risk of COVID-19, anxiety, and sleep quality?
5. What factors affect nurses' sleep quality, coronavirus anxiety, and COVID-19 risk perception?

Method

Study Design

This study was planned as descriptive and correlational design.

Participants and Setting

The research universeconsisted of 657 nurses working in a university hospital and a state hospital in the Black Sea Region.

Research Population and Sample

The population of the study consists of 657 nurses. This study was completed with 248 nurses. The number of samples was calculated with the known universe sample calculation formula. For the incidence of the examined event, the coronavirus anxiety level of the nurses (41%), determined in the study by Nikčević et al. (2021), was used.

Sample calculation with known universe: $n= Nt^2pq/d^2(N-1)$

N: Number of individuals in the population

n: Number of individuals to be sampled

p: Frequency of the occurrence of the investigated event (0.41)

q: Frequency of the non-occurrence of the investigated event (0.59)

t: Theoretical value found from the t table at a certain degree of freedom and detected an error level (1.96)

d: The desired deviation according to the incidence of the event (0.05)

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

n: 657x(0.41)x(0.59)x(3.84)/656x(0.0025)=248 nurses

Inclusion Criteria

- Volunteering to participate in the research
- Being an actively working nurse

Exclusion Criteria

-Withdrawing at any stage after being included in the study

Data Collection Tools

The data were collected face-to-face between July 1, 2021, and December 29, 2021, using a Questionnaire form, the COVID-19 Perceived Risk Scale (CPRS), the Coronavirus Anxiety Scale (CAS), and the Pittsburg Sleep Quality Index (PSQI). The forms and scales were filled in by the nurses.

The Questionnaire Form: The form has questions about socio-demographic information like age, marital status, education status, employment status, family type, income level, place of residence, the status of contracting COVID-19 and vaccination status, and loss of any relative due to COVID-19.

The COVID-19 Perceived Risk Scale: The COVID-19 Perceived Risk Scale (CPRS) was developed by Yıldırım and Güler (2020) to determine the risk perception of people to contract COVID-19, and its validity and reliability study was conducted. The scale is a five-point Likert type with eight items. It has "Cognitive risk" and "Emotional risk" sub-dimensions. Items 1, 2, 3, and 4 are about the cognitive dimension, and items 5, 6, 7, and 8 are about the emotional dimension. A minimum of 8 and a maximum of 40 points can be obtained from the scale. Cronbach's alpha reliability coefficient was found to be 0.77 in the original study and 0.87 in this study.

The Coronavirus Anxiety Scale: The Coronavirus Anxiety Scale (CAS) is a screening tool for anxiety experienced by individuals during the coronavirus pandemic. It was developed by Lee (2020) and adapted into Turkish by Evren et al. (2022). The scale has 90% sensitivity and 85% specificity for the diagnosis of coronavirus anxiety. The CAS is a Likert-type scale consisting of 5 items in which behaviors and experiences in the last 2 weeks are questioned and scored from 0 to 4. High scores indicate that the individual should be referred for further evaluation and treatment. The lowest and the highest scores are 0 and 20. Cronbach's alpha reliability coefficient was found to be 0.93 in the original study and 0.95 in this study.

The Pittsburg Sleep Quality Index: The Pittsburg Sleep Quality Index (PSQI) was developed by Buysse et al. (1989) and its Turkish validity and reliability study was performed by Ağargün et al. (1996). The PSQI is a self-report scale and is a measurement tool that evaluates the sleep quality of individuals in the last month. The 7 components of the PSQI are subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication, and daytime dysfunction. The items on the scale have scores ranging from 0 (no distress at all) to 3 (severe distress). The total score of the PSQI is obtained by adding the scores from the subscales, and the score range varies between 0 and 21.6 points and above indicate poor sleep quality, and 5 points and below indicate good sleep quality. The Cronbach's alpha reliability coefficient in the validity study was found to be 0.80 and 0.88 in this study.

Data Collection

The data were collected face-to-face using a Questionnaire form, the COVID-19 Perceived Risk Scale, the Coronavirus Anxiety Scale, and the Pittsburg Sleep Quality Index. Collecting each data took approximately 10-15 minutes.

Data Analysis

The data was analyzed by descriptive tests such as frequency, arithmetic mean, percentage, and standard deviation. The conformity of the data to the normal distribution was evaluated with the Kolmogorov-Smirnov test, histogram graph, normal distribution curve, Skewness, and Kurtosis coefficients. Since the research data did not conform to the normal distribution, intergroup differences were evaluated with the Mann-Whitney U test and Kruskal Wallis test, which are non-parametric tests. The relationships between the scale scores were evaluated with the Spearman correlation analysis test. A linear regression analysis was also used. $p<0.05$ was considered statistically significant.

Ethical Considerations

Before starting the research, permission was obtained from the authors of the scales by e-mail. Approval from Ordu University Non-Invasive Clinical Research Ethics Committee (17.06.2021-144), Ministry of Health COVID-19 research permission and institutional permission from the health directorate of the province where the research was carried out (the letter dated 17.06.2021 and numbered 0602265) was obtained. Verbal and written informed consent was obtained from nurses who volunteered to participate in the study.

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

Results

The mean age of the nurses was 34.97±8.18 years, 89.5% were female, 29.8% were in the 27-31 age group, 70.6% were married, and 67% had children. 56.9% were college or faculty graduates, 30.6% had a chronic disease, and 5.6% had a mental illness (see Table 1).

who were female, who were married, who had three or more children, who had a bachelor's degree, and who had a chronic and mental illness; and the differences in CPRS total mean scores were statistically significant according to age group (p=0.022), gender (p=0.024), marital status (p=0.036), and mental illness status (p=0.011) (see Table 1).

Cognitive sub-dimension mean scores were examined according to the sociodemographic characteristics, and it was found that nurses who were 42 years old or older, who were female, who were married, who had two children, who had an associate degree, and who had a chronic and mental illness had higher mean scores than the other groups; and the differences in CPRS Cognitive subscale mean scores were statistically significant according to age (p=0.026), gender (p=0.038), marital status (p=0.008), and presence of chronic disease (p=0.032), presence of mental illness (p=0.006) (see Table 1).

The mean CAS scores were evaluated according to the sociodemographic characteristics of the nurses, and it was determined that nurses who were in the 27-31 age group, who were female, who were single, who had two children, who had an associate degree, and who had chronic and mental illness had higher mean CAS scores than other nurses, and the differences between the groups were statistically significant (p=0.012), (see Table 1). It was determined that 31.9% of the nurses had been working for 0-5 years, 25% worked in the surgical unit, and 84.3% worked as ward nurses. 71% worked day and night shifts, 62.9% worked 51 hours or more weekly, and 73% experienced changes in sleep patterns during the pandemic period (see Table 2).

According to the clinical and working characteristics of the nurses, nurses who worked for 21 years or more, who worked in a COVID-19 isolation clinic or outpatient clinic, who had the permanent night shift, who worked 40 hours a week, who experienced changes in sleep patterns during the pandemic, and who defined sleep quality as good had higher CPRS mean scores than other groups, and the difference between the mean scores of the

The mean score was 29.73±6.66 for the COVID-19 Perceived Risk Scale, 4.22±0.28 for the Coronavirus Anxiety Scale score, and 8.30±3.3 for the Pittsburg Sleep Quality Index (Table 1). According to the socio-demographic characteristics of the nurses, the CPRS total mean scores were higher in nurses who were 42 years of age or older, working year was statistically significant (p=0.049), (see Table 2).

The mean scores of the CPRS Cognitive sub-dimension were evaluated according to the clinical and working characteristics of the nurses, and it was found that the mean scores of the nurses who had a working year of 21 years or more, who worked in the COVID-19 isolation clinic or as an outpatient clinic nurse, who had the permanent night shift, who worked 40 hours a week, who experienced changes in sleep patterns during the pandemic, and who defined sleep quality as good were higher than the other groups. As for the CPRS Emotional sub-dimension mean scores, unlike the CPRS Cognitive sub-dimension mean scores, only the mean scores of the nurses who defined sleep quality as poor were higher than the other groups; the difference between the groups in the CPRS Cognitive sub-dimension mean scores for years of working experience (p=0.017) and position in the clinic (p=0.019) was statistically significant significant between the groups (p>0.05), (see Table 2).

The mean CAS scores of the nurses with 0-5 years of working years, those working in COVID-19 intensive care, those working as a training nurse, those with permanent night shift, those with a weekly 51 hours working week, those experiencing a change in sleep patterns during the pandemic, and those having poor sleep quality were higher than the others, and the differences between the groups in the CAS total mean scores of experiencing changes in sleep patterns (p=0.000) and sleep quality (p=0.001) were statistically significant (see Table 2).

The mean scores of the PSQI of nurses who had a working experience of 16-20 years, who worked in COVID-19 intensive care, who worked day and night shifts, who worked 40 hours a week, who experienced changes in sleep patterns during the pandemic, and who defined sleep quality as poor were higher than the other groups, and the difference between the groups was statistically significant in the mean PSQI scores in terms of the clinic (p=0.043), working schedule (p=0.003), experiencing changes in sleep patterns during the pandemic (p=0.020), and sleep quality (p=0.000) (see Table 2).

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

Table 1. Comparison of CPRS and sub-dimensions, CAS, PSQI scores according to nurses' socio-demographic characteristics (n=248)

			CPRS Cognitive sub-dimension $\bar{X}$±SS	CPRS Emotional sub-dimension $\bar{X}$±SS	CPRS Total Score $\bar{X}$±SS	CAS Total Score $\bar{X}$±SS	PSQI Total Score $\bar{X}$±SS
Total score			14.38±0.23	14.78±0.25	29.73±6.66	4.22±0.28	8.30±3.3
Characteristics of Nurses	**n**	**%**					
Age (years)							
22-26	32	12.9	13.34±3.60	15.81±3.27 ***a***	29.15±5.58 ***a***	3.53±4.20 ***a***	8.34±3.82
27-31	74	29.8	14.10±3.77	14.36±4.07 ***b***	28.47±7.08 ***b***	5.51±4.84 ***b***	8.21±3.45
32-36	46	18.5	14.54±3.14	14.17±3.83 ***c***	28.71±6.11 ***c***	3.13±3.67 ***c***	7.47±3.19
37-41	36	14.5	13.72±3.70	13.41±4.26 ***d***	27.13±6.98 ***d***	2.66±3.14 ***d***	8.11±3.47
42 and above	60	24.3	15.56±3.66	16.05±3.76 ***e***	31.61±6.38 ***e***	4.76±5.14 ***e***	9.15±4.42
Test and p value			KW= 11.085, **p=0.026**	KW=14.451, **p=0.006 d-e between**	KW= 11.485, **p=0.022**	KW= 12.902, **p=0.012 b-c between b-d between**	KW= 4.233, p=0.375
Gender							
Female	222	89.5	14.54±3.64	14.93±3.95	29.48±6.66	4.22±4.54	8.28±3.77
Male	26	10.5	13.03±3.54	13.50±3.98	26.53±6.15	4.19±4.49	8.46±3.43
Test and p value			MWU= 2170, **p=0.038**	MWU= 2263, p=0.071	MWU=2105**,** **p=0.024**	MWU=2817**,** p=0.841	MWU=2786**,** p=0.772
Marital status							
Married	175	70.6	14.78±3.61	14.90±4.10	29.69±6.88	4.14±4.65	8.08±3.66
Single	73	29.4	13.43±3.60	14.49±3.65	27.93±5.97	4.39±4.25	8.83±3.86
Test and p value			MWU= 5025, **p=0.008**	MWU= 5891, p=0.333	MWU= 5310, **p=0.036**	MWU= 5986, p=0.428	MWU= 5697, p=0.178
Number of children							
I haven't child	82	33.0	13.64±3.75	14.91±3.69	28.56±6.21	4.01±4.02	8.37±3.76
1 child	52	21.0	14.40±3.49	14.57±3.94	28.98±6.73	3.80±4.34	8.38±3.81
2 children	86	34.7	14.91±3.67	14.76±4.17	29.68±6.94	4.82±4.92	8.26±3.82
3 children and above	28	11.3	14.89±3.38	14.85±4.41	29.75±7.13	3.75±5.08	8.07±3.36
Test and p value			KW=5.401, p=0.145	KW=0.244, p=0.970	KW=1.947, p=0.583	KW=2.928, p=0.403	KW=0.126, p=0.989
Graduated school							
Health high school	31	12.5	13.03±3.43	14.32±3.28	27.35±5.02	3.70±4.26	8.12±3.52
Associate degree	49	19.8	14.71±4.48	14.53±4.27	29.24±8.12	5.42±5.30	9.08±3.46
Bachelor's degree	141	56.9	14.48±3.43	14.84±4.18	29.32±6.69	3.97±4.40	7.94±3.78
Postgraduate education	27	10.9	14.38±3.65	14.78±3.97	29.17±6.66	4.22±4.53	8.30±3.73
Test and p value			KW=5.647, p=0.130	KW=1.658, p=0.646	KW=3.932, p=0.269	KW=2.475, p=0.480	KW=4.764, p=0.190
Chronic disease							
Yes	76	30.6	15.17±3.42	15.34±3.56	30.51±5.93	4.59±4.63	8.65±3.71
No	172	69.4	14.04±3.71	14.54±4.13	28.58±6.90	4.05±4.49	8.15±3.73
Test and p value			MWU=5422, **p=0.032**	MWU=5908, p=0.226	MWU=5565, p=0.062	MWU=6111, p=0.407	MWU=5966, p=0.272
Have mental ilnesses?							
Yes	14	5.6	16.92±2.70	16.35±3.49	33.28±5.68	4.71±6.75	9.64±3.56
No	234	94.4	14.23±3.65	14.69±3.99	28.92±6.65	4.19±4.38	8.22±3.73
Test and p value			MWU=925, **p=0.006**	MWU=1225, p=0.112	MWU=974, **p=0.011**	MWU=1578, p=0.815	MWU=1217, p=0.105

CAS: Coronavirus Anxiety Scale, CPRS: COVID-19 Perceived Risk Scale, PSQI: Pittsburg Sleep Quality Index
$\bar{X}$: Arithmetic Mean, SS: Standard Deviation; MWU: Mann-Whitney U test, KW: Kruskal Wallis test

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

Table 2. Comparison of CPRS and sub-dimensions, CAS, PSQI scores according to nurses' clinical and work characteristics (n=248)

Characteristics of Nurses	n	%	CPRS Cognitive sub-dimension $\bar{x}$±SS	CPRS Emotional sub-dimension $\bar{x}$±SS	CPRS Total Score $\bar{x}$±SS	CAS Total Score $\bar{x}$±SS	PSQI Total Score $\bar{x}$±SS
Year of study							
0-5 years	79	31.9	13.46±3.52 ***a***	14.50±3.79	27.97±6.00 ***a***	4.81±4.33	8.48±3.38
6-10 years	56	22.6	14.03±3.80 ***b***	14.28±4.05	28.32±7.43 ***b***	4.67±4.72	7.80±3.42
11-15 years	32	12.9	15.18±2.90 ***c***	15.12±3.73	30.31±5.72 ***c***	2.81±4.06	7.31±3.19
16-20 years	25	10.1	14.96±4.21 ***d***	14.04±4.37	29.00±7.46 ***d***	3.52±4.23	9.36±3.80
21 years and above	56	22.5	15.32±3.55 ***e***	15.82±4.02	31.14±6.54 ***e***	4.05±4.90	8.66±4.57
Test and p value			KW=12.043, **p=0.017 a-e between**	KW=7.168, p=0.127	KW=9.532, **p=0.049 a-e between**	KW=8.732, p=0.068	KW=5.262, p=0.261
Clinic studied							
COVID intensive care	13	5.2	15.69±4.21	14.84±5.27	30.53±8.87	6.69±7.92	9.76±3.11
COVID isolation	3	1.2	16.66±2.08	17.66±1.52	34.33±3.21	3.33±2.08	7.66±5.50
Intensive care	42	16.9	14.09±3.48	14.21±4.38	28.30±6.86	3.64±3.76	8.73±3.35
Internal medicine service	61	24.6	14.47±3.61	14.80±3.65	29.27±6.31	4.96±4.76	7.96±3.97
Surgical service	62	25.0	14.27±3.75	14.48±3.80	28.75±6.71	3.69±4.06	7.91±3.21
Emergency	25	10.1	13.36±3.54	14.48±4.44	27.84±6.87	3.56±4.00	8.60±2.97
Operating room	8	3.2	13.50±3.66	15.12±4.38	28.62±7.19	4.75±3.57	8.37±2.61
Polyclinic	34	13.8	15.05±3.70	15.88±3.49	30.94±5.86	4.05±4.71	8.35±5.25
Test and p value			KW=7.743, p=0.356	KW=4.844, p=0.679	KW=6.537, p=0.479	KW=3.807, p=0.802	KW=5.181, p=0.638
Mission in the clinic							
Administrator nurse	31	12.5	14.45±2.82	15.35±3.32	29.80±5.45	4.12±4.46	9.35±4.11
Clinical nurse	209	84.3	14.23±3.76	14.62±4.09	28.86±6.84	4.19±4.59	8.16±3.64
Education nurse	4	1.6	17.50±1.00	15.75±2.06	33.25±2.21	6.75±3.77	11.00±3.65
Polyclinic nurse	4	1.6	18.50±0.57	17.75±2.62	36.25±3.09	3.75±2.62	4.75±1.70
Test and p value			KW=9.997, **p=0.019**	KW=3.081, p=0.379	KW=7.537, p=0.057	KW=2.077, p=0.557	KW=8.130, **p=0.043**
Working term							
Continuous daytime	56	22.5	13.69±3.56	15.00±4.27	28.69±6.20	3.10±3.94	7.69±3.77
Continuous night	16	6.5	15.75±2.88	16.00±2.58	31.75±4.82	4.68±3.85	5.75±3.41
Changes daytime and night	176	71.0	14.48±3.72	14.60±3.97	29.09±6.92	4.53±4.72	8.73±3.64
Test and p value			KW=4.441, p=0.109	KW=1.696, p=0.428	KW=2.332, p=0.312	KW=5.824, p=0.054	KW=11.534, **p=0.003**
Weekly working hours							
40 hours	44	17.7	14.59±3.37	14.93±4.07	29.52±6.07	3.50±3.92	8.68±3.92
41-50 hours	48	19.4	13.93±4.09	14.87±3.90	28.81±6.93	3.79±4.81	7.97±3.81
51 hours and above	156	62.9	14.46±3.60	14.71±3.99	29.18±6.77	4.55±4.59	8.30±3.66
Test and p value			KW=0.568, p=0.753	KW=0.089, p=0.956	KW=0.236, p=0.889	KW=2.831, p=0.243	KW=1.235, p=0.539
The state of experiencing changes in sleep patterns during the pandemic							
Yes	181	73.0	14.42±3.59	14.94±3.71	29.37±6.56	4.96±4.57	8.62±3.61
No	67	27.0	14.28±3.85	14.35±4.62	28.64±6.94	2.22±3.79	7.43±3.92
Test and p value			MWU=5945, p=0.813	MWU=5786, p=0.579	MWU=5670, p=0.433	MWU=3592, **p=0.000**	MWU=4897, **p=0.020**
Sleep quality							
Good sleep quality (6 points above)	55	22.2	14.83±3.35	14.76±4.22	29.60±6.31	2.36±3.05	3.63±1.33
Poor sleep quality (5 points or less)	193	77.8	14.25±3.73	14.79±3.91	29.05±6.77	4.75±4.74	9.63±3.06
Test and p value			MWU=4863, p=0.342	MWU=5248, p=0.899	MWU=5077, p=0.623	MWU=3761, **p=0.001**	MWU=0000, **p=0.000**

CAS: Coronavirus Anxiety Scale, CPRS: COVID-19 Perceived Risk Scale, PSQI: Pittsburg Sleep Quality Index
$\bar{x}$:Arithmetic Mean, SS: Standard Deviation; MWU: Mann-Whitney U test, KW: Kruskal Wallis test

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

It was determined that 49.2% and 59.3% of the nurses, and their family members were infected with Covid-19, respectively. 88.7% got vaccinated against COVID-19, 15.7% had lost a first-degree family member due to COVID-19, and 41.5% had lost a relative due to COVID-19 (see Table 3).

The mean scores of CPRS Emotional sub-dimension mean scores of the nurses who did not have COVID-19, who had a COVID-19-positive family member, who got COVID-19 vaccination, who lost a first-degree family member due to COVID-19, and who lost a relative due to COVID-19 were higher than the other groups, and the difference between the groups in terms of the CPRS Emotional sub-dimension mean score of those who lost one of their relatives due to COVID-19 (p=0.010) was statistically significant (see Table 3).

The mean CAS scores of the nurses who had COVID-19, those who did not have a family member with COVID-19, those who got COVID-19 vaccination, those who lost a family member due to COVID-19, and those who did not lose a relative due to COVID-19 were higher than the other groups, and the difference between the groups was statistically significant; and the difference between the groups in the CAS total mean score of nurses who lost a first-degree family member due to COVID-19 was statistically substantial (p=0.005) (see Table 3).

The mean PSQI scores of the nurses who got infected with COVID-19, those who did not have a COVID-19-positive family member, those who did not get COVID-19 vaccination, those who lost a first-degree family member due to COVID-19, and those who lost a relative due to COVID-19 were higher than the other groupsA statistically significant difference was found between the groups in the mean PSQI total score according to losing a relative due to COVID-19 (p=0.018) (see Table 3).

Table 3. Comparison of nurses' CPRS and sub-dimensions, CAS, PSQI scores according to COVID-19 characteristics (n=248)

Characteristics of Nurses	n	%	CPRS Cognitive sub-dimension X̄±SS	CPRS Emotional sub-dimension X̄±SS	CPRS Total Score X̄±SS	CAS Total Score X̄±SS	PSQI Total Score X̄±SS
Infected with COVID-19 status							
Yes	122	49.2	14.57±3.45	14.74±3.62	29.31±6.43	4.27±4.19	8.41±3.54
No	126	50.8	14.20±3.84	14.82±4.30	29.03±6.91	4.16±4.85	8.19±3.91
Test and p value			MWU=7269, p=0.459	MWU=7382, p=0.589	MWU=7490, p=0.729	MWU=7227, p=0.409	MWU=7389, p=0.597
A family member's have COVID-19							
Yes	147	59.3	14.34±3.56	14.81±3.92	29.16±6.61	4.10±4.06	8.27±3.43
No	101	40.7	14.44±3.79	14.74±4.07	29.18±6.77	4.39±5.15	8.35±4.14
Test and p value			MWU=7234, p=0.733	MWU=7403, p=0.970	MWU=7392, p=0.955	MWU=7155, p=0.624	MWU=7184, p=0.665
Get vaccination COVID-19							
Yes	220	88.7	14.47±3.61	14.87±3.89	29.35±6.55	4.25±4.53	8.24±3.72
No	28	11.3	13.71±3.95	14.07±4.57	27.78±7.47	4.00±4.64	8.78±3.78
Test and p value			MWU=2718, p=0.310	MWU=2781, p=0.400	MWU=2697, p=0.283	MWU=2863, p=0.537	MWU=2759, p=0.368
Lost a first-degree family member due to COVID-19							
Yes	39	15.7	14.82±3.58	15.38±3.17	30.20±6.32	5.82±4.48	8.89±3.50
No	209	84.3	14.30±3.67	14.67±4.10	28.98±6.72	3.92±4.49	8.19±3.77
Test and p value			MWU=3700, p=0.360	MWU=3759, p=0.440	MWU=3654, p=0.305	MWU=2936, **p=0.005**	MWU=3657, p=0.307
Lost of a relative due to COVID-19							
Yes	103	41.5	14.54±3.70	15.58±3.62	30.12±6.13	3.73±4.02	8.99±3.76
No	145	58.5	14.27±3.63	14.22±4.13	28.49±6.96	4.56±4.84	7.82±3.64
Test and p value			MWU=7144, p=0.560	MWU=6044, **p=0.010**	MWU=6452, p=0.068	MWU=6987, p=0.381	MWU=6153, **p=0.018**

CAS: Coronavirus Anxiety Scale, CPRS: COVID-19 Perceived Risk Scale, PSQI: Pittsburg Sleep Quality Index
X̄:Arithmetic Mean, SS: Standard Deviation; MWU: Mann-Whitney U test

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

There was a moderate positive correlation between the participants' PSQI scores and CAS total score (r=.300, p<0.01), a weak positive correlation between the PSQI and CPRS total score (r=.157, p<0.05), a weak positive correlation between the PSQI and CPRS Emotional subscale score (r=.148, p<0.05), but no correlation between the PSQI and CPRS Cognitive subscale score (r=.117, p>0.05). A positive, moderately significant relationship was found between CPRS Cognitive subscale scores and CPRS Emotional subscale scores (r=.519, p<0.01), (see Table 4).

Table 4. Correlations between CPRS and sub-dimensions, CAS, PSQI

	CPRS Cognitive sub-dimension Total	CPRS Emotional sub-dimension Total	CPRS Total	CAS Total	PSQI Total
CPRS Cognitive sub-dimension	-				
CPRS Emotional sub-dimension	.519**	-			
CPRS Total	.854**	.876**	-		
CAS Total	.078	.112	.115	-	
PUKI Total	.117	.148*	.157*	.300**	-

** Correlation is significant at the 0.05 level, ** Correlation is significant at the 0.01 level*
CAS: Coronavirus Anxiety Scale, CPRS: COVID-19 Perceived Risk Scale, PSQI: Pittsburg Sleep Quality Index

A linear regression model was used to evaluate the effect of nurses' COVID-19 risk perception and coronavirus anxiety on sleep quality. COVID-19 risk perception and coronavirus anxiety influenced sleep quality (R= .326, R^2=.106, F= 14.517, p<0.01). According to the standard regression coefficients (β), coronavirus anxiety (β=.265) and COVID-19 risk perception (β=.147) were found to affect sleep quality, respectively. The t-test results of the regression coefficients were analyzed, and it was found that the predictors of sleep quality were COVID-19 risk perception (p=.017) and coronavirus anxiety (p<0.01) (p>0.05), (Table 5).

Table 5. Predictors of nurses' sleep quality

	B	***SE***	***β***	***t***	***p* value**
(Constant)	4.982	1.012		4.922	**.000**
CAS	.218	.051	.265	4.311	**.000**
CPRS	.082	.034	.147	2.398	**.017**

R= .326, R^2=.106, F= 14.517, p<0.01, CAS: Coronavirus Anxiety Scale, CPRS: COVID-19 Perceived Risk Scale

Discussion

Our study showed that the perceived risk level of nurses was above average, and their coronavirus anxiety level was below the average level. Nurses were emotionally affected by the pandemic, and their anxiety levels increased more than other individuals due to fear of getting infected, stigmatization by society, social isolation, etc. In the study of Bayülgen et al. (2021), it was determined that the anxiety level of nurses was high during the COVID-19 pandemic, and in the study of Alenazi et al. (2020), it was determined that healthcare workers experienced moderate and high levels of anxiety during the COVID-19 epidemic. Sperling (2021) emphasized that 32.7% of the nurses in the study had a high perceived risk against COVID-19, and the perceived risk among health professionals was higher among nurses than other health professionals (Gorini et al., 2020; Sperling, 2021). In the study, the average PSQI total score of the nurses was calculated as 8.30±3.3 and it was determined that the nurses had poor sleep quality. In the studies with nurses conducted both before and during the pandemic in Turkey and abroad, it was found that nurses had poor sleep quality (Asi Karakaş et al., 2017; Basatemür and Güneş, 2021; Deniz Doğan et al., 2019; Han et al., 2016; Park et al., 2018; Şayık et al., 2021). In a systematic review conducted during the pandemic period, it was reported that the sleep quality of caregivers of COVID-19-positive individuals among healthcare personnel was even worse (Şayık et al., 2021). From this point of view, it is thought that nurses, whose sleep quality is already poor due to the increasing number of cases during the pandemic, have worsened their sleep quality with anxiety and fear. As a result of nurses' one-to-one contact with COVID-19-positive individuals and being obliged to care for them, it is thought that their mental state is badly affected, and their sleep quality is also impaired. Additionally, this study determined that COVID-19 risk perception and anxiety negatively affected nurses' sleep quality. Sürme and Akbuğa (2021) determined

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

in their study with surgical nurses that the COVID-19 epidemic significantly increased the level of anxiety and negatively affected sleep quality. In the study of Simonetti et al. (2021), it was determined that there was a positive relationship between sleep disorders and anxiety in nurses during the pandemic period, and the levels of anxiety and sleep disorders were high. In line with these results, it can be said that our study results are similar to the literature.

According to the study, the mean score of the "cognitive" sub-dimension and the mean score of the "emotional" sub-dimension of the perceived risk of nurses aged 42 years and over were found to be significantly higher than the other age groups. Kim et al. (2021) found that the perceived stress against the COVID-19 pandemic decreased with increasing age. The level of anxiety increased as the age of healthcare workers increased during the COVID-19 pandemic (Karasu et al., 2022; de Pinho et al., 2021). In another study, hypersensitivity, anxiety and health anxiety scores of nurses aged 31 and over were found to be higher (Gülbetekin et al., 2022). It can be said that the increase in the perceived risk level at older ages in the nurses in our study is affected by the existing chronic diseases, the uncertainty of the pandemic, and the fear of being infected accordingly.

In our study, the perceived risk level of COVID-19 was found to be significantly higher in female nurses, and female health workers were found to have higher anxiety and stress levels than male health workers (Lasalvia et al., 2021; Rodriguez-Menéndez et al., 2021). Şahin and Kulakaç (2021) found that male nurses had higher anxiety levels towards the COVID-19 pandemic. In our study, the mean scores of perceived risk and cognitive subscale scores of married nurses and nurses working for 21 years or more were significantly higher. Jemal et al. (2021) also found that married healthcare workers had more symptoms of depression, anxiety, and related insomnia. Lasalvia et al. (2021) found that perceived risk and depression levels were higher in people living alone. In Akalın and Modanlıoğlu's (2021) study, it was observed that negative moods increased with increasing working experience, while Sperling (2021) found no significant relationship between working experience and COVID-19 perceived risk level. It is thought that the perceived risk levels of nurses with more working experience in the profession will also increase due to their concerns about their health as they are getting older. While the perceived risk total mean scores of nurses with chronic and mental illness in our study were significantly higher, nurses who lost any of their relatives due to COVID-19 had higher perceived risk emotional sub-dimension mean scores, and those who lost a first-degree family member had higher anxiety levels. Nurses with any mental or chronic illness were also found to have a significant effect on stress, anxiety, and depression levels during the pandemic (Alenazi et al., 2020; Zheng et al., 2021). Apart from the pandemic, the sense of loss caused negative emotions such as anxiety, stress, and depression, the pandemic emerged suddenly and caused unexpected deaths, and the number of deaths increased day by day, increasing the perceived risk level and anxiety in individuals (Cheval et al., 2018; Gorini et al., 2020; Lasalvia et al., 2021).

In the current study, the sleep quality of those who lost their relatives due to COVID-19 was worse. Unlike the findings of our study, statistical significance was not found in studies on the sleep quality of those who lost a relative due to COVID-19 (Uyar and Ateş Budak, 2021). It is thought that nurses who have lost a loved one due to COVID-19 know the disease process and its severity, and the possibility that they or a loved one may die from the same disease may have triggered fear and anxiety in nurses and negatively affected their sleep quality.

In our study, the mean total score of PSQI was higher, and sleep quality was worse in nurses working day/night shifts. Like our results, it has been reported in studies that nurses worked day/night shifts have worse sleep quality and lower sleep duration than those working only day shifts (Ferri et al., 2016; Deniz Doğan et al., 2019; Basatemür and Güneş, 2021). Nurses working in constantly changing shifts do not have regular sleep hours, have difficulty falling asleep, and have more sleep-related problems (Asi Karakaş et al., 2017; Park et al., 2018). It has been reported that having a working life with changing hours causes sleep disorder, gastritis, hypertension, breast cancer, diabetes, sleep problems, depression, and burnout (Geniş et al., 2020). Healthcare workers have the lowest sleep quality among all occupational groups (Yuan et al., 2020). Nurses are more likely to experience occupational accidents in the morning hours (Ferri et al., 2016), and low sleep quality and lack of sleep patterns are thought to be effective factors in occupational accidents. Sleep, mentioned in Maslow's hierarchy of needs, is necessary to sustain life, and for the organism to maintain its resistance (Şayık et al., 2021). In this case, for nurses

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

to provide healthcare to patients during the pandemic period, they must first have a good quality of life and sleep status.

In our study, nurses who experienced changes in sleep patterns during the pandemic period and stated that they had poor sleep quality had higher mean scores on the PSQI. Tu et al. (2020) found that the insomnia symptoms in nurses increased, and sleep quality decreased during the pandemic period. The results reported a positive correlation between sleep quality and coronavirus anxiety (Uyar and Ateş Budak, 2021). Increased working hours negatively affected social life, and the uncertainty of the pandemic triggered anxiety and negatively affected nurses' sleep quality. With the increase in sleep-related problems during the pandemic period, a concept called COVID-insomnia was derived, and those with sleep disorders during the pandemic were identified (Gupta and Pandi-Perumal, 2020). The prevalence of sleep disorders during the pandemic is between 2.3-76.6% (Tasnim et al., 2020). In the literature, the prevalence of sleep disorders was found to be 36% in healthcare workers and 74.8% in COVID-19-positive patients (Jahrami et al., 2021). It can be said that the sleep quality of healthcare workers worsened during the pandemic (Kibar et al., 2022). In this context, it is thought that since healthcare workers are obliged to care for COVID-19 positive individuals and are more likely to be infected with coronavirus, their anxiety and sleep disturbances have increased more, and their sleep quality has worsened. These results suggest that anxiety, sleep patterns, and sleep quality are in a vicious cycle within themselves.

As mentioned above, the physiological problems experienced during the pandemic also affect the mental state of human beings, who are biopsychosocial. Based on these results, it is thought that nurses, whose sleep quality was already poor before the pandemic, were also psychologically affected, and their sleep quality worsened.

Limitations of the study

This study has some limitations. Nurses who care for COVID-19 positive patients in the hospital where the research was conducted could not be reached. In addition, some nurses were infected with the COVID-19 virus and could not be reached because they were not in the hospital. The study resultsare limited to the nurses in the relevant hospitals and cannot be generalized to all nurses.

Conclusion and Recommendations

In conclusion, COVID-19 risk perception and coronavirus anxiety disrupted nurses' sleep quality. There was a perceived risk of coronavirus in older nurses, who were female, were married, and had more working experience. Nurses who were middle-aged, and those who had changes in sleep patterns had coronavirus anxiety. During the pandemic period, nurses' working hours in the clinic, working schedules, changes in sleep patterns, and loss of a relative due to COVID 19 also disrupted nurses' sleep quality. Therefore, considering the negative effects of the pandemic, arrangements should be made in clinical environment conditions and working hours so that nurses can work more efficiently and provide better patient care. It is recommended to take psychological therapeutic measures for the COVID-19 pandemic or other possible post-pandemic outbreaks, and to develop support programs for nurses and healthcare workers with high risk groups. It is recommended that similar studies be conducted in larger populations to evaluate the long-term effects of COVID-19.

Acknowledgments

We thank all the nurses who agreed to participate in the study.

Ethics Committee Approval: Approval from Ordu University Non-Invasive Clinical Research Ethics Committee (17.06.2021-144).
Peer-review: External referee evaluation.
Author Contributions: Conception and design: NE, FA, GY, HGB; Collection of data: FA, GY, HGB; Analysis and interpretation of data: NE, FA, GY, HGB; Drafting the manuscript: NE, FA, GY, HGB; Final approval of the version to be submitted: NE, FA, GY, HGB.
Conflict of interest: The authors declare that they have no conflict of interest.
Financial Disclosure: No financial support has been received for this research.

What did the study add to the literature?

- Due to the pandemic, the anxiety levels of the nurses the study increased, and their moods and their sleep quality were disrupted.
- During the pandemic period, nurses who work both day and night shifts and have long working hours may be adversely affected physiologically and psychologically, which may result in a negative impact on the quality of care provided to patients in the clinical environment.

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

References

Ağargün MY, Kara H, Anlar O. (1996) The validity and reliability of the Pittsburgh Sleep Quality Index. Turkish Psychiatry Journal, 7(2), 107-115.

Akalın B, Modanlıoğlu A. (2021). Professionals working in intensive care in the Covid-19 Process. Acıbadem University Health Sciences Journal, 12(2), 346-352. https://doi.org/10.31067/acusaglik.850978

Alenazi TH, BinDhim NF, Alenazi MH, Tamim H, Almagrabi RS, Aljohani SM, …..Alqahtani, SA. (2020). Prevalence and predictors of anxiety among healthcare workers in Saudi Arabia during the COVID-19 pandemic. Journal of Infection and Public Health, 13(11), 1645-1651. https://doi.org/10.1016/j.jiph.2020.09.001

Asi Karakaş S, Gönültaş N, Okanlı A. (2017). The quality of sleep of nurses who works shift workers. Journal of ERU Faculty of Health Sciences, 4(1), 17–26.

Basatemür M, Güneş G. (2021). Evalution of night nutrition habits and sleep quality in nurses: An example of university hospital. ESTUDAM Public Health Journal, 6(3), 227–236. https://doi.org/10.35232/ESTUDAMHSD.857926

Bayülgen MY, Bayülgen A, Yeşil FH, Türksever, H.A. (2021). COVID-19 pandemisi sürecinde çalışan hemşirelerin anksiyete ve umutsuzluk düzeylerinin belirlenmesi. Sağlık Bilimleri Üniversitesi Hemşirelik Dergisi, 3(1), 1-6. https://doi.org/10.48071/sbuhemsirelik.839229

Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ. (1989). The pittsburgh sleep quality index: A new instrument for psychiatric practice and research. Psychiatry Research, 28, 193-213.

Cheval B, Mongin D, Cullati S, Winz C, Arx MV, Schmidt R.E, …… Courvoisier D.S. (2018). Reciprocal relations between care-related emotional burden and sleep problems in healthcare professionals: A multicentre international cohort study. Occupational & Environmental Medicine, 0:1-7. http://dx.doi.org/10.1136/oemed-2018-105096

Deniz Doğan S, Arslan S, Aydıngülü N, Koparan H, Gülşen M. (2019). Sleep quality of nurses working with shift system. Cukurova Medical Journal, 44(4), 1196–1202. https://doi.org/10.17826/CUMJ.511429

de Pinho LG, Sampaio F, Sequeira C, Teixeira L, Fonseca C, Lopes MJ. (2021). Portuguese nurses' stress, anxiety, and depression reduction strategies during the covid-19 outbreak. International Journal of Environmental Research and Public Health, 18(7), 3490, https://doi.org/10.3390/ijerph18073490

Duygulu S, Açıl S.B, Özdemir EK, Erdat Y. (2020). COVID-19 outbreak: Nurse managers' role and responsibilities. Journal of Hacettepe University Faculty of Nursing, 7, 34-46.

Evren C, Evren B, Dalbudak E, Topcu M, Kutlu N. (2022). Measuring anxiety related to COVID-19: A Turkish validation study of the coronavirus anxiety scale. Death Studies, 46(5), 1052-1058.

Ferri P, Guadi M, Marcheselli L, Balduzzi S, Magnani D, Di Lorenzo R. (2016). The impact of shift work on the psychological and physical health of nurses in a general hospital: A comparison between rotating night shifts and day shifts. Risk Management and Healthcare Policy, 9, 203–211. https://doi.org/10.2147 /RMHP.S115326

Geniş B, Coşar B, Taner ME. (2020). Factors affecting mental status and effects of shift work system in healthcare workers. Journal of Psychiatric Nursing, 11(4), 275–283.

Gorini A, Fiabane E, Sommaruga M, Barbieri S, Sottotetti F, La Rovere MT, ….. Gabanelli P. (2020). Mental health and risk perception among Italian healthcare workers during the second month of the Covid-19 pandemic. Archives of Psychiatric Nursing, 34(6), 537-544. https://doi.org/10.1016/j.apnu.2020.10.007

Gupta R, Pandi-Perumal SR. (2020). COVID-insomnia: How the pandemic affects sleep/wake regulation and how to deal with it? Sleep and Vigilance, 4(2), 51–53. https://doi.org/10.1007/S41782-020-00118-0

Gülbetekin E, Gül F, Tunç Y. (2022). Covid-19 sürecinde hemşirelerin sağlık anksiyete düzeylerini etkileyen faktörlerin belirlenmesi. Black Sea Journal of Health Science, 5(2), 226-231.

Han Y, Yuan Y, Zhang L, Fu Y. (2016). Sleep disorder status of nurses in general hospitals and its influencing factors. Psychiatria Danubina, 28(2), 176–183. https://hrcak.srce.hr/file/258835

Jahrami H, BaHammam AS, Bragazzi NL, Saif Z, Faris M, Vitiello MV. (2021). Sleep problems during the COVID-19 pandemic by population: A systematic review and meta-analysis. Journal of Clinical Sleep Medicine, 17(2), 299–313. https://doi.org/10.5664/JCSM.8930/SUPPL_FILE/JCSM.8930.DS001.PDF

Jemal K, Deriba BS, Geleta TA. (2021). Psychological distress, early behavioral response, and perception toward the COVID-19 pandemic among health care workers in North Shoa zone, Oromiya region. Frontiers in Psychiatry, 1-12. https://doi.org /10.3389 /fpsyt.2021.628898

Kang L, Ma S, Chen M, Yang J, Wang Y, Li R., ….. Liu Z. (2020). Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. Brain, Behavior, and Immunity, 87,11–17. https://doi.org/10.1016/j.bbi.2020.03.028

Karasu F, Öztürk Çopur E, Ayar D. (2022). The impact of COVID-19 on healthcare workers' anxiety levels. Journal of Public Health, 30(6), 1399-1409, https://doi.org/10.1007/s10389-020-01466-x

Kibar F, Muharremoğlu Z, Oturak G, Çokluk S, Güven E, Onur İ. (2022). Evaluation of anxiety levels and sleep quality of health care workers working in filiation during the COVID-19 pandemic. Turkish Journal of

Ordu University J Nurs Stud
2024, 7(2), 387-398
DOI:10.38108/ouhcd.1337076

Family Medicine and Primary Care, 16(1), 66–75. https://doi.org/10.21763/tjfmpc.989004

Kim SC, Quiban C, Sloan C, Montejano A. (2021). Predictors of poor mental health among nurses during COVID- 19 pandemic. Nursing Open, 8(2), 900-907, https://doi.org/10.1002/nop2.697

Lasalvia A, Bonetto C, Porru S, Carta A, Tardivo S, Bovo C, ….. Amaddeo F. (2021). Psychological impact of COVID-19 pandemic on healthcare workers in a highly burdened area of north-east Italy. Epidemiology and Psychiatric Sciences, 30, e1,1–13. https://doi.org/10.1017/S2045796020001158

Lee SA. (2020). Coronavirus anxiety scale: A brief mental health screener for COVID-19 related anxiety. Death Studies, 44(7), 393–401. https://doi.org/10.1080/07481187.2020.1748481

Mo Y, Deng L, Zhang L, Lang Q, Liao C, Wang N, …. Huang H. (2020). Work stress among Chinese nurses to support Wuhan in fighting against COVID- 19 epidemic. Journal of Nursing Management, 28(5), 1002-1009. https://doi.org/10.1111/jonm.13014

Nikčević AV, Marino C, Kolubinski DC, Leach D, Spada MM. (2021). Modelling the contribution of the Big Five personality traits, health anxiety, and COVID-19 psychological distress to generalised anxiety and depressive symptoms during the COVID-19 pandemic. Journal of Affective Disorders, 279, 578-584. https://doi.org/10.1016/j.jad.2020.10.053

Park E, Lee HY, Park CSY. (2018). Association between sleep quality and nurse productivity among Korean clinical nurses. Journal of Nursing Management, 26(8), 1051–1058. https://doi.org/10.1111 /JONM. 12634

Rodriguez-Menéndez G, Rubio-García A, Conde-Alvarez P, Armesto-Luque L, Garrido-Torres N, Capitan L, …..Crespo-Facorro B. (2021). Short-term emotional impact of COVID-19 pandemic on Spaniard health workers. Journal of Affective Disorders, 278, 390-394. https://doi.org/10.1016 /j.jad. 2020.09.079

Simonetti V, Durante A, Ambrosca R, Arcadi P, Graziano G, Pucciarelli G, ... & Cicolini G. (2021). Anxiety, sleep disorders and self- efficacy among nurses during COVID- 19 pandemic: A large cross- sectional study. Journal of clinical nursing, 30(9-10), 1360-1371.

Sperling D. (2021). Ethical dilemmas, perceived risk, and motivation among nurses during the COVID-19 pandemic. Nursing Ethics, 28(1), 9-22, https://doi.org/10.1177/0969733020956376

Sürme, Y., & Akbuğa, G. A. (2022). The Effect of COVID-19 Outbreak on Anxiety and Sleep Quality of the Surgical Nurses. Journal of Molecular Virology and Immunology, 2022; 3(2), 105-112. https://doi.org/10.46683/jmvi.2022.54

Şahin CU, Kulakaç N. (2022). Exploring anxiety levels in healthcare workers during COVID-19 pandemic: Turkey sample. Current Psychology, 41(2), 1057-1064, https://doi.org/10.1007/s12144-021-0173

Şayık D, Açıkgöz A, Mutlu F. (2021). Sleep quality of medical staff during the coronavirus pandemic: A meta-analysis. Journal of Turkish Sleep Medicine, 1, 1-6. https://doi.org/10.4274/jtsm.galenos.2021.51523

Tasnim S, Rahman M, Pawar P, Chi X, Yu Q, Zou L., … Hossain MM. (2020). Epidemiology of sleep disorders during COVID-19 pandemic: A systematic scoping review. MedRxiv. https://doi.org/10.1101 /2020.10.08.20209148

Tu ZH, He JW, Zhou N. (2020). Sleep quality and mood symptoms in conscripted frontline nurse in Wuhan, China during COVID-19 outbreak: A cross-sectional study. Medicine, 99(26), e20769 https://doi.org/10.1097/MD.0000000000020769

Uyar B, Ateş Budak E. (2021). Sleep quality of medical students in Turkey during the Covid-19 pandemic. MAS Journal of Applied Sciences, 6(4), 940–949. https://doi.org/10.52520/MASJAPS.140

World Health Organization (WHO) (2020a). Report of the WHO China Joint Mission on coronavirus disease 2019 (COVID-19). www.who.int/docs/default-source/coronaviruse/who-chinajoint-mission-on-covid-19-final-report.pdf (Accessed Date: 20 April 2022).

World Health Organization (WHO) (2020b). Rolling updates on coronavirus diseases (COVID-19). www.who.int/emergencies/ diseases /novel-coronavirus-2019/ events-as-they -happen (Accessed Date: 20 April 2022).

Yıldırım M, Güler A. (2020). Factor analysis of the COVID-19 Perceived Risk Scale: A preliminary study. Death Studies, 1-8. https://doi.org/10.1080 /07481187.2020.1784311

Yuan S, Liao Z, Huang H, Jiang B, Zhang X, Wang Y, Zhao M. (2020). Comparison of the indicators of psychological stress in the population of Hubei province and non-endemic provinces in China during two weeks during the coronavirus disease 2019 (COVID-19) outbreak in february. Medical Science Monitor, 26: e923767-1–e923767-10.

Yücesan B, Özkan Ö. (2020). Evaluation of the COVID-19 pandemic process in terms of health management. Eurasian Journal of Health Sciences, 3, 134-139.

Zheng R, Zhou Y, Qiu M, Yan Y, Yue J, Yu L, …. Hu Y. (2021). Prevalence and associated factors of depression, anxiety, and stress among Hubei pediatric nurses during COVID-19 pandemic. Comprehensive Psychiatry, 104, 152217. https://doi.org/10.1016 /j.comppsych.2020.152217