# The relationship between the work-related strain, psychological flexibility and psychological resilience levels of nurses in the COVID-19 pandemic process

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**ABSTRACT:**

**Purpose:** This research was conducted to define relationship between the work-related strain, psychological flexibility, psychological resilience levels of nurses in COVID-19 pandemic.

**Material and Methods:** This cross-sectional, correlational research was carried out with 359 nurses. The data were collected using a Personal Information Form, the Work-Related Strain Inventory, Acceptance and Action Questionnaire II and Brief Resilience Scale.

**Results:** The mean work-related strain score of the participants was 41.45±6.51 (min:18, max: 72), while their mean psychological resilience score was 18.57±4.72.

**Conclusion:** As a result of this study, it was determined that, as psychological resilience levels of nurses increased, their psychological flexibility levels also increased.

*Keywords:* COVID-19 pandemic; nurse; work-related strain; psychological resilience

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## INTRODUCTION

Emerging in the city of Wuhan in China in late 2019, COVID-19 has shown a rapid spread and taken the entire world under its effect (Lai et al., 2020). The novel coronavirus that hadn't been detected in humans before has affected millions of people around the world and led to the emergence of the COVID-19 pandemic and the deaths of millions of people. By 31 January 2021, 2,205,515 people had died in the world, and 101,917,147 cases had been detected (WHO, 2021). In Turkey, according to the data of the Turkish Ministry of Health, 25,993 people lost their lives, and 2,447,463 cases were determined (T.C. Ministry of Health, 2021). The rapid spreading rate and high risk of COVID-19 pandemic have led the workload of healthcare workers to increase by causing many people to get infected and hospitals to be filled up in a short time (Uyurdağ et al., 2021). In parallel with the increase in workloads, the risk of healthcare workers to get infected with COVID-19 has increased, and individuals in this professional group are considered as a high-risk group in terms of infection (Yurtseven and Arslan, 2020). It is estimated that, in 44 countries around the world, more than 1,500 nurses have lost their lives, and the COVID-19-related healthcare worker deaths may be higher than 20,000 (International Council of Nursing, 2020).

Nurses who are in the frontlines in the fight against COVID-19 have to struggle with several problems in addition to the risk of spreading infection and death. In this process, as a result of long and shift-style

working hours of nurses, their fears of getting infected with COVID-19 and transmitting it to their families, work overload, long durations of using personal protective equipment and lack of sufficient personal protective equipment, increased numbers of patients, higher workload of nurses working in high-risk units, increased demand for nurses as infected nurses take a break from work and increased circulation of nurses in specialized units that require experience, nurses may experience difficulty in adaptation, burnout, fatigue and stress (Greenberg et al.; 2020, Fernandez et al., 2020). Because of nurses are working an intense and risky environment in the COVID-19 process may lead them to experience work-related stress, and by affecting their health negatively, it may cause psychological problems (Mo et al., 2020; Purabdollah and Ghasempour, 2020).

It is valuable to protect the mental health and psychological adaptation of nurses who take on the treatment and care of COVID-19 patients, and concerns about this situation may develop (Purabdollah and Ghasempour, 2020; Santarone, McKenney and Elkbuli, 2020). Studies have reported that 50.4% of healthcare professionals treating COVID-19 patients in China experienced depressive symptoms, 44.6% experienced anxiety, and 71.5% experienced psychological distress, Aksoy and Koçak, (2020) stated that more than half of 758 nurses and midwives in their study had high levels of uncertainty-related anxiety and needed psychological support, Liu et al. identified psychological distress (15.9%), anxiety (16%) and depressive symptoms (34.6%) among 4679 doctors and nurses at 348 hospitals in China, and Kang et al. (2020) determined that, among 994 physicians and nurses working in Wuhan in the coronavirus pandemic process, the mental health of 36.9% was under the threshold levels, 34.4% had mild levels and 22.4% had moderate levels of mental problems (Aksoy and Koçak, 2020; Liu et al., 2020; Kang et al., 2020). Besides all these issues, it is considered that high psychological resilience and psychological flexibility levels are important in nurses' effective fight against COVİD infection and their protection of own mental health (Bahar et al.,2020). Psychological resilience and psychological flexibility refer to the ability of a person to have adaptation to healthy compliance and coping mechanisms in stressful, distressing and difficult conditions (Salande and Hawkins, 2017; Buz and Genç, 2019). Both concepts may become effective in reducing the negative effects of strain and stress that influence mental health and improving mental health the positive direction in such a difficult process as this pandemic. Arslan et al., (2020) determined that, in the COVID-19 pandemic process, psychological resilience reduced the effects of a negative mental state and increased the effects of a positive mental state on psychological health. In this context, investigating the effect of this concept on the psychological health of nurses who are fighting in the frontlines in the COVID-19 pandemic process has become an important and prominent topic to study in this period (Yıldırım, Arslan and Worg, 2021).

In this pandemic process that has influenced Turkey and the entire world, development of arrangements and interventions to protect the mental health of nurses has become prominent. Accordingly, our study aims to investigate the relationship between the work-related strain, psychological resilience and psychological flexibility levels of nurses.

## MATERIAL and METHODS
### Type of the Study
This study is a cross-sectional and correlational research

### Study design and participants
The population of this cross-sectional and correlational study consisted of nurses working at the Firat University Faculty of Medicine Hospital. The research was carried out between July 2020 and September 2020. The sample size the study was determined as 359 with a 95% confidence interval and a 5% error rate by G*Power 3.1.3 (Heinrich Heine Universitat, Dusseldorf, Germany) analysis. The inclusion criteria were as: a) being voluntary to participate in the study, b) being employed as a nurse at the Fırat University Hospital, and c) being actively working during the COVID-19 pandemic process. Exclusion criteria wee as: a) not being voluntary to participate in the study, b) being employed outside the Fırat University Hospital or in

a position other than nursing, and c) not working actively during the COVID-19 pandemic process due to any reason (e.g., being on leave without payment).

## Data Collection

The data of this research were collected by using a Personal Information Form, the Work-Related Strain Inventory (WRSI), the Brief Resilience Scale (BRS) and the Acceptance and Action Questionnaire-II (AAQ-II) and face-to-face by  researchers.

## Data Collection Instrument

### Personal Information Form

Personal Information Form, consist of 16 questions sociodemographic, occupational COVID-19 pandemic -related characteristics of the participants.

### The Work-Related Strain Inventory

Work-Related Strain Inventory developed by Revicki, May and Whitley (1991) was adapted into Turkish by Aslan et al. (1998). The scale is an 18-item, 4-point Likert-type self-report scale that was developed for the purpose of determining work-related strain and stress in individuals working in the field of health. Scoring is in the form of 4=completely applied to me; 3=almost completely applies to me; 2=somewhat applies to me, and 1=does not apply to me. Items 2, 4, 8, 9, 11 and 15 are inversely scored. The minimum and maximum possible scores are 18 and 72. Higher total scores indicate increased levels of work-related strain (Revicki, May and Whitley, 1991; Aslan, et al.,2020).

### The Brief Resilience Scale (BRS)

The Brief Resilience Scale (BRS) was developed to measure the potential of individuals to bounce back and their psychological resilience. The scale was developed by Smith et al. (2008) and adapted into Turkish by Doğan (2015). It is a 6-item, 5-point Likert-type self-report scale. It is scored in the form of 1=not suitable at all; 2=somewhat suitable; 3=suitable, and 4=completely suitable. Among these 6 items, items 2, 4 and 6 are inversely scored, but they need to be firstly reversed in the scoring scheme. After this process, higher scores indicate higher levels of psychological resilience, while lower

scores indicate lower levels (Smith et al., ; Doğan, 2015).

### Acceptance and Action Questionnaire-II (AAQ-II)

Acceptance and Action Questionnaire-II (AAQ-II) scale that aims to assess psychological flexibility levels in individuals was developed as a result of problems experienced in terms of reliability and significance in its first form, the Acceptance and Action Questionnaire-I. It is a 7-item, 7-point Likert-type scale, where high scores indicate psychological inflexibility, and low scores indicate psychological flexibility (Bond et al., 2011). The Turkish adaptation and testing of the validity and reliability of AAQ-II were performed by Yavuz et al. (2017). Higher scores in AAQ-II have been associated with depressive, obsessive-compulsive and anxiety symptoms, lower scores have been associated with quality of life, and it has been shown to be a valid measurement instrument in both clinical and non-clinical samples. Internal consistency and time-invariance analyses for reliability and exploratory and confirmatory factor analyses for construct validity have been carried out. Convergent validity, concurrent validity and predictive validity analyses have been additionally conducted. With the mean Alpha coefficient of 0.84, the internal validity of the scale was found as good (Yavuz et al., 2016).

## Statistical Analyses

Data analysis was done through the SPSS 23.In the study, descriptive statistical methods as frequencies, percentages, means, standard deviations, medians, minima and maxima were used in analysis of sociodemographic data. Compliance of the data with normal distribution was examined based on the skewness and kurtosis values. The parametric tests of "independent-samples t-test and one-way analysis of variance (ANOVA)" were used for the analysis of the normally distributed data, and the non-parametric tests of "Kruskal Wallis test, Mann-Whitney U test and Tamhane's T2 test" were used for non-normally distributed data. The relationship between the scores obtained from the scales was determined by Pearson's correlation analysis. Results were interpreted in a 95% confidence interval, on a significance level of $p < 0.05$.

**Ethical Considerations**

Before the study was conducted, ethics approval was obtained from Ethics Committee (dated 17/03/2020-E.1821), and written permission was obtained from the related units. Before the data were collected, the participants were informed about the study and that participation was based on voluntariness.

**RESULTS**

The mean age of the 359 nurses who participated the study was 31.20±7.67 (years). Among the nurses, 79.9% were female, 53.2% were married, the vast majority (79.4%) had undergraduate or higher degrees, 77.7% did not work at Covid units, 76.6% worked in shifts, and almost all (86.3%) considered their working conditions to be negative and in need of improvement. Among all nurses, the duration of work of 72.1% was 10 years or shorter, the weekly work duration of 62.4% was 40 hours, and 76.6% worked in shifts (Table 1). According to the comparison of the descriptive characteristics of the nurses and their scale scores, there was a significant relationship between their gender (Z=-2.576; p=0.010) and education level (χ2=17.242; p=0.001) and their mean BRS scores. Accordingly, it was determined that the psychological resilience levels of the male nurses were higher than those of the female nurses, while the psychological resilience levels of the nurses who had degrees from vocational high schools of health and those who had postgraduate degrees were also higher (Table 1). There was a significant relationship between the working style of the nurses and their mean AAQ-II scores (χ2=13.802; p=0.001). Accordingly, it was determined that the nurses who were working at night showed higher levels of depressive, obsessive-compulsive and anxiety symptoms, and their psychological inflexibility levels were higher in comparison to those working in daytime and those working in shifts (Table 1). There was a significant relationship between the nurses' statuses of assessing their working conditions and their mean WRSI scores (χ2=14.770; p = 0.001). The work-related strain levels of those who considered their working conditions to be negative and in need of improvement were higher. There were no significant differences in the scale scores of the participants based on age, marital status, weekly working hours or total work duration (p> 0.05; Table 1).

It was found that 61% of the nurses who participated in the study had received training about the pandemic, 84.1% had provided care for suspected or diagnosed patients, and more than half (57.7%) lived separately from their families due to the pandemic. Additionally, it was found that almost all nurses (94.2%) experienced concerns of transmitting the disease to another person, 82.7% followed the posts of health institutions and associations, and the vast majority (87.5%) experienced concern/stress/strain in relation to the pandemic (Table 2). There was a significant relationship between the status of the nurses' of living separately from their families due to the pandemic and their mean AAQ-II scores (Z=-.2.990; p=0.003). Accordingly, the nurses who lived separately from their family members displayed more depressive, obsessive-compulsive and anxiety symptoms, and their psychological inflexibility was higher in comparison to those who did not live separately from their family members. There was a significant relationship between the nurses' status of having concerns about transmitting the disease to another person and their mean BRS (Z=-2.707; p=0.007) and AAQ-II (Z=-3.231; p=0.001) scores (p<0.05; Table 2). Those who did not have such a concern had higher psychological resilience levels, and they were psychologically more flexible. There was a significant relationship between the nurses' status of thinking that they had enough and accurate information about COVID-19 and their mean scale scores. Accordingly, the nurses who thought they had sufficient and accurate information had lower work-related strain levels and higher psychological resilience and flexibility levels (p<0.05; Table 2). There was a significant relationship between the nurses' status of experiencing stress, concern and strain in relation to the pandemic and their mean BRS (Z=-2.546; p=0.011) and AAQ-II (Z=-2.357; p=0.018) scores. Those who experienced stress had lower psychological resilience and higher psychological inflexibility levels.

The participants' mean WRSI score was 41.45±6.51, their mean BRS score was 18.57±4.72, and their mean AAQ-II score was 20.61±8.82.

**Table 1.** Comparison of the Descriptive Characteristics and Mean Scale Scores of the Nurses (N=359)

| Variable | n (%) | WRSI X±SD Median | WRSI Statistical analysis | BRS X±SD Median | BRS Statistical analysis | AAQ-II X±SD Median | AAQ-II Statistical analysis |
|---|---|---|---|---|---|---|---|
| **Gender** | | | | | | | |
| Female | 287(79.9) | 41.00 | Z=-0.003 | 18.00 | Z=-2.576 | 20.00 | Z=-0.607 |
| Male | 72(20.1) | 42.00 | p=0.998[a] | 20.00 | **p=0.010[a]** | 20.00 | p=0.544[a] |
| | | | U=10330.00 | | **U=8310.00** | | U=51182.50 |
| **Marital status** | | | | | | | |
| Married | 191(53.2) | 41.00 | Z=-1.123 | 18.00 | Z=-1.316 | 19.00 | Z=-1.437 |
| Single | 168(46.8) | 40.00 | p=0.262[a] | 19.00 | p=0.188[a] | 21.00 | p=0.151[a] |
| | | | U=14944.00 | | U=14557.00 | | U=14635.50 |
| **Education level** | | | | | | | |
| Vocational high school of health[1] | 28(7.8) | 42.00 | χ2=1.618 | 20.00 | χ2=17.242 | 17.50 | χ2=7.752 |
| Associate's[2] | 46(12.8) | 40.00 | p=0.655[b] | 18.00 | **p=0.001[b]** | 17.00 | p=0.051[b] |
| Undergraduate[3] | 261(72.7) | 41.00 | SD=3 | 18.00 | SD=3 | 21.00 | SD=3 |
| Postgraduate[4] | 24(6.7) | 40.00 | | 21.00 | [1-2,3]* [4-2,3]* | 16.50 | |
| **Weekly working duration(hours)** | | | | | | | |
| 40 | 224(62.4) | 41.20±6.63 | t=-0.904 | 17.75±4.73 | t=0.970 | 20.08±9.76 | t=-1.720 |
| Over 40 | 135(37.6) | 41.85±6.32 | p=0.366[c] | 18.25±4.70 | p=0.333[c] | 21.85±8.77 | p=0.086[c] |
| **Total work duration (years)** | | | | | | | |
| 1 or shorter | 134(37.3) | 40.00 | χ2=4.547 | 19.00 | χ2=1.152 | 21.00 | χ2=5.361 |
| 2-10 | 125(34.8) | 41.00 | p=0.103[b] | 18.00 | p=0.562[b] | 20.00 | p=0.069[b] |
| 11 or longer | 100(27.9) | 41.00 | SD=2 | 18.00 | SD=2 | 18.50 | SD=2 |
| **Unit of work** | | | | | | | |
| Internal medicine clinic | 49(13.6) | 42.38±6.84 | | 17.93±4.88 | | 22.97±8.59 | |
| Surgicalclinic | 54(15.0) | 40.35±6.38 | F=0.886 | 18.11±4.85 | F=0.867 | 21.98±8.85 | F=2.277 |
| COVID unit | 80(22.3) | 41.15±7.28 | p=0.472[d] | 19.20±4.81 | p=0.484[d] | 21.68±11.24 | p=0.061[d] |
| Intensive care | 101(28.1) | 41.32±5.86 | | 18.85±4.40 | | 18.88±8.20 | |
| Other | 75(20.9) | 42.12±6.37 | | 18.26±4.87 | | 19.93±9.46 | |
| **Style of work** | | | | | | | |
| Daytime[1] | 60(16.7) | 42.00 | χ2=0.029 | 18.00 | χ2=0.033 | 15.00 | χ2=13.802 |
| Night[2] | 24(6.7) | 39.50 | p=0.986[b] | 19.50 | p=0.983[b] | 24.00 | **p=0.001[b]** |
| Shift[3] | 275(76.6) | 41.00 | SD=2 | 18.00 | SD=2 | 20.00 | SD=2 [1-2]* |
| **Assessment of working conditions** | | | | | | | |
| Positive[1] | 49(13.6) | 38.00 | χ2=14.770 | 19.00 | χ2=3.460 | 16.00 | χ2=4.555 |
| Negative[2] | 68(18.9) | 42.00 | **p=0.001[b]** | 18.00 | p=0.177[b] | 21.00 | p=0.103[b] |
| Needs Improvement[3] | 242(67.4) | 41.00 | SD=2 [1-2,3]* | 19.00 | SD=2 | 20.00 | SD=2 |
| Age (years) | | 31.20±7.67 | r=0.042 p=0.425** | 31.20±7.67 | r=-0.009 p=0.862** | 31.20±7.67 | r=-0.094 p=0.074** |

Note: Bold values are statistically significant. n: frequency; %: percentageX±SD: Mean±standard deviation. [a]Mann Whitney U test; [b]Kruskal Wallis test; [c]Independent-samples t-test; [d]One-Way Analysis of Variance; *Tamhane's T2 test; ** Pearson'scorrelation coefficient

According to the correlation analysis results on the WRSI, BRS and AAQ-II scores of the nurses, there was a moderate negative relationship between the WRSI and BRS total scores of the participants, while there was a moderate positive relationship between their total WRSI and AAQ-II scores (p<0.01). Based on these results, as the psychological resilience levels of the nurses decreased, their work-related strain levels increased. Likewise, as their psychological flexibility decreased, their work-related strain levels increased.

Moreover, there was a moderate negative relationship between the nurses' total BRS and AAQ-II scores (p<0.01). Accordingly, as the psychological resilience of the nurses increased, their psychological flexibility levels also increased (Table 3).

**Table 2.** Comparison of the Scale Scores of the Nurses Based on Their Occupational and COVID-19 Pandemic-Related Characteristics (N=359)

| Variable | n(%) | WRSI Median | WRSI Statistical analysis | BRS Median | BRS Statistical analysis | AAQ-II Median | AAQ-II Statistical analysis |
|---|---|---|---|---|---|---|---|
| **Status of having received training on the pandemic** | | | Z=-1.062 | | Z=-1.021 | | Z=-0.079 |
| Yes | 219(61.0) | 40.00 | p=0.288ᵃ | 19.00 | p=0.307ᵃ | 20.00 | p=0.937ᵃ |
| No | 140(39.0) | 41.00 | U=14313.00 | 18.00 | U=14354.00 | 19.00 | U=15254.50 |
| **Status of having provided care to a suspected/diagnosed patient** | | | Z=-0.253 | | Z=-1.478 | | Z=-0.606 |
| Yes | 302(84.1) | 41.00 | p=0.800ᵃ | 19.00 | p=0.139ᵃ | 20.00 | p=0.545ᵃ |
| No | 57(15.9) | 41.00 | U=8425.50 | 18.00 | U=7548.50 | 17.00 | U=8172.00 |
| **Status of living separately from family members due to the pandemic** | | | Z=-0.722 | | Z=-0.206 | | Z=-.2.990 |
| Yes | 152(42.3) | 41.00 | p=0.470ᵃ | 19.00 | p=0.837ᵃ | 22.00 | **p=0.003ᵃ** |
| No | 207(57.7) | 41.00 | U=15031.50 | 18.00 | U=15532.50 | 19.00 | U=12829.00 |
| **Status of having concerns about transmitting the disease to family/friends/other employees** | | | Z=-1.534 | | Z=-2.707 | | Z=-3.231 |
| Yes | 338(94.2) | 41.00 | p=0.125ᵃ | 18.00 | **p=0.007ᵃ** | 20.00 | **p=0.001ᵃ** |
| No | 21(5.8) | 40.00 | U=2842.00 | 22.00 | U=2304.00 | 15.00 | U=2059.00 |
| **Status of thinking of having sufficient and accurate information about COVID-19** | | | Z=-3.363 | | Z=-2.213 | | Z=-2.709 |
| Yes | 205(57.1) | 40.00 | **p=0.001ᵃ** | 19.00 | **p=0.027ᵃ** | 19.00 | **p=0.007ᵃ** |
| No | 154(42.9) | 42.00 | U=12516.50 | 18.00 | U=13638.00 | 22.00 | U=13150.50 |
| **Status of following the posts of health institutions and associations about the pandemic** | | | Z=-0.537 | | Z=-0.744 | | Z=-1.915 |
| Yes | 297(82.7) | 41.00 | p=0.591ᵃ | 19.00 | p=0.457ᵃ | 19.00 | p=0.056ᵃ |
| No | 62(17.3) | 40.00 | U=8808.00 | 18.00 | U=8656.00 | 22.00 | U=7785.00 |
| **Status of experiencing stress, concern, strain about the pandemic** | | | Z=-1.440 | | Z=-2.546 | | Z=-2.357 |
| Yes | 314(87.5) | 41.00 | p=0.150ᵃ | 18.00 | **p=0.011ᵃ** | 20.00 | **p=0.018ᵃ** |
| No | 45(12.5) | 40.00 | U=6128.50 | 20.00 | U=5413.00 | 16.00 | U=5531.50 |

Note: Bold values are statistically significant. n: frequency; %: percentage; ᵃMann Whitney U test

**Table 3.** Distribution of the Nurses' Scores in the "Work-Related Strain Inventory (WRSI)", "Brief Resilience Scale (BRS)" and "Acceptance and Action Questionnaire-II (AAQ-II)"(n=359)

| | Min-Max Possible in the Scale | Min-Max Received by the Participants | Median | Mean Scores X±SD | Cronbach's alpha value |
|---|---|---|---|---|---|
| **Work-Related Strain Inventory** | 18-72 | 23-63 | 41 | 41.45±6.51 | 0.681 |
| **Brief Resilience Scale** | 6-30 | 6-30 | 18 | 18.57±4.72 | 0.818 |
| **Acceptance and Action Questionnaire-II** | 7-49 | 7-49 | 20 | 20.61±8.82 | 0.902 |

The results of the regression analysis of psychological flexibility as a factor related to psychological resilience presented that psychological flexibility was a negative factor for psychological resilience which explained 20.4% of the total variance observed in psychological resilience (F = 91.611; p <0.05; Adjusted $R^2$=0.204) (Tablo 4).

The results of the hierarchical linear regression analysis that was conducted to determine the variables related to work-related strain are shown in Table 5. In the first model, BRS and AAQ-II were included as the independent variables, and their level of explaining work-related strain was tested. It was determined that BRS and AAQ-II explained work-related strain by 21.1% (F = 47.616; p <0.05; Adjusted $R^2$=0.211). The second model included four variables including BRS and AAQ-II, as well as the perceptions of the nurses regarding their working conditions and information status about COVID-19.

**Table 4.** Correlation Values Between the Nurses' Mean WRSI, BRS and AAQ-II scores (n=359)

| Scales* | | BriefResilienceScale (BRS) | Acceptance and Action Questionnaire-II (AAQ-II) |
|---|---|---|---|
| Work-Related Strain Inventory (WRSI) | r** | -0.389 | 0.357 |
| | p | **0.000** | **0.000** |
| Brief Resilience Scale (BRS) | r** | - | -0.429 |
| | p | - | **0,000** |

* Pearson's correlation analysis; ** Correlation coefficient (r=0.00-0.30 weak, r=0.31-0.70 moderate, r=0.71-1.00 strong)

**Table 5.** Hierarchical Regression Analysis Results on Factors Related to Work-Related Strain (N=359)

| | | Variables | ß | t | p | VIF | F | Model (p) | Adjusted R2 | DW |
|---|---|---|---|---|---|---|---|---|---|---|
| WRSI | Model 1 | Constant | 46.150 | 24.971 | 0.001 | | 47.616 | 0.001 | 0.211 | |
| | | BRS | -0.428 | -5.880 | 0.001 | 1.257 | | | | |
| | | KEF | 0.156 | 4.291 | 0.001 | 1.257 | | | | |
| | Model 2 | Constant | 42.119 | 19.173 | 0.001 | | 27.133 | 0.001 | 0.235 | 1.885 |
| | | BRS | -0.426 | -5.832 | 0.001 | 1.297 | | | | |
| | | KEF | 0.141 | 3.869 | 0.001 | 1.286 | | | | |
| | | Perceptions on working conditions | 0.870 | 2.039 | 0.042 | 1.038 | | | | |
| | | Perceptions on COVID-19-related information status | 1.474 | 2.365 | 0.019 | 1.040 | | | | |

## DISCUSSION

The COVID-19 pandemic has been and is providing unmatched contributions in terms of revealing the importance of the profession of nursing. Understanding the psychological change process of nurses during the care of COVID-19 patients is important in terms of the sustainability of health services. This study presented the relationship between the work-related strain, psychological flexibility and psychological resilience levels of nurses in COVID-19 pandemic process.

As nurses are individuals who are in intense and continuous communication with people due to the nature of their field of work, they experience work-related strain (Avcı et al., 2018; Koşucu, Göktaş and Yıldız, 2017). As it has exposed nurses to a working environment with high work demand and low resources, COVID-19 pandemic has led them to experience higher levels of work stress and more symptoms of physical and psychological stress (Mo et al., 2020; Nie et al.,2020). A study conducted on Chinese nurses in the COVID-19 process determined the mean stress load score of nurses was 39.91±12.92 (Mo et al., 2020). In a study conducted on nurses from the Philippines, it was found that nurses who experienced fear of COVID-19 and

psychological distress also experienced lower job satisfaction and higher levels of intention to leave job (Labrague et al., 2020). A study conducted in Spain stated that nurses showed moderate levels of negative psychological distress symptoms in the pandemic process (Lorente, Vera and Peiro, 2021). In this study, the mean work-related strain score of the nurses was 41.45±6.51 (min:18, max: 72). Although this study is not directly comparable to other studies due to the lack of another study using a similar measurement instrument, it was revealed that, in this study, the nurses experienced moderate and high levels of work-related strain. This finding may be explained by the intense experience of regular stressors that have been experienced by the nurses throughout COVID-19 process. Additionally, in this process, high demand for health services and the insufficiency of existing resources may have predicted the higher work-related strain levels of the nurses (Mo et al., 2020).While psychological resilience is conceptualized as the capacity to successfully respond to excessive stress, trauma or negative experiences, studies conducted in the current pandemic period on the relationship between psychological resilience and mental health appear to be highly limited (Blanc, et al., 2021; Ran et al., 2020). Investigation of the psychological resilience of nurses who are in the frontlines in the fight against the COVID-19 pandemic is highly important in terms of understanding whether or not they successfully respond to this traumatic experience. In this research, mean psychological resilience score of nurses was determined as 18.57±4.72. Although the measurement instrument used in this study for psychological resilience does not have a cutoff point, considering that the score range of the scale is 6 to 30, it may be stated that the nurses had moderate levels of psychological resilience. This finding was compatible with studies conducted before the pandemic and those conducted in the pandemic process (Guo et al., 2017; Kutluturkan et al., 2016). As psychological resilience is considered as a characteristic or capacity that allows individuals to cope with distress against traumatic experiences and adapt positively, it is important for individuals to remain in a positive psychological stage (Bonannon and Mancini, 2008;

Weiss and Berger, 2010). The moderate level of psychological resilience obtained in this study showed that the nurses who fought against COVID-19 could display their capacity to successfully overcome the experienced psychological pressure and adapt to new situation (Doğan, 2015). In terms of comparative roles of psychological resilience and psychological flexibility on work-related strain in this study, psychological resilience explained the largest part of total explained variance in the work-related strain levels of the nurses. In other words, as the psychological resilience levels of the nurses decreased, their work-related strain levels increased. This finding appeared to be compatible with the literature demonstrating that psychological resilience is a main variable in reducing the negative psychological effects of the pandemic and preventing these effects (Blanc et al., 2021; Ran et al., 2020). Accordingly, the probability of nurses who have high psychological resilience to experience work-related strain is lower, while the probability of those who have low psychological resilience to experience work-related strain is higher. Especially the witnessing of the difficulties experienced by patients in breathing in the COVID-19 by the nurses may have led them to analyze the existing situation and potential problems in a rational way. This, in turn, may have created positive emotions in the rational reactions they gave to the experience and led them to become more resilient in the face of such situations in the future. Psychological flexibility is seen as a resilience factor that alleviates effects of COVID-19 (McCracken et al., 2021). Researchers have stated that targeting psychological flexibility following trauma may provide recovery by increasing resilience (Meyer, et al., 2019). In chaotic processes like a pandemic, the understanding of the importance of psychological flexibility as one of resources of psychological resilience is increasing daily (Daks, Peltz and Regge, 2020) . A study in Italy reported that psychological flexibility increased resilience during COVID-19, and psychological flexibility interventions improved mental health (Pakenham et al., 2020). In this study, psychological flexibility was a factor associated with psychological resilience, and it explained 20.4% of variance observed in psychological resilience. In this sense,

the findings of similar studies in the literature about COVID-19 supported the positive relationship between psychological resilience and psychological flexibility that was determined in this study (McCracken et al., 2021; Pakenham et al., 2020). In another study, it was seen that psychological flexibility was positively associated with a state of wellbeing, whereas it was negatively related to anxiety, depression and COVID-19-related distress (Dawson and Golijani-Moghaddam, 2020). It was also determined that psychological flexibility reduced suicide risk in the context of COVID-19 stress factors, and it supported mental health in the context of social isolation during COVID-19 (Smith et al., 2020). Although it is not possible to make a direct comparison to other studies, in this study, it was revealed that, as the psychological flexibility levels of nurses decreased, their work-related strain levels increased. This finding of the study was compatible with findings in other studies conducted in the COVID-19 process which have revealed the negative relationship between psychological flexibility and psychological distress-related factors. Although the participants of this study did not receive any intervention supporting psychological flexibility, accordingly, the nurses seemed to have spent time and cognitive resources to try to control and organize their negative psychological experiences by getting in touch with their intrinsic experiences. As a result, it may be considered as a pleasing development that the nurses had more resources to notice opportunities regarding the goals that are present in their existing situations and emergency-focused opportunities in relation to their psychological flexibility levels.

## Limitations

This study had some limitations. First of all, as participation was voluntary, there may have been a selection bias. The probability of nurses with extremely positive or negative experiences to participate may have been higher, and more neutral perceptions may have been excluded. Second of all, these data were cross-sectional, and the analyses revealed correlations. Therefore, causality cannot be inferred directly. Future studies may be carried out with a longitudinal design to achieve the analysis of the long-term development of the variables.

## Conclusions

The findings of this study showed that the nurses who were fighting the disease in the frontlines in the COVID-19 pandemic process experienced significant levels of psychological flexibility, psychological resilience and work-related strain. This study showed that psychological flexibility is important for supporting the psychological resilience of nurses going through a chaotic process. It was also revealed that psychological resilience and psychological flexibility were determinant factors in terms of supporting a decrease in the work-related strain of the nurses. In summary, the nurses who had high psychological resilience and psychological flexibility levels had a lower probability of experiencing work-related strain, while those who had low psychological resilience and psychological flexibility levels had a higher probability.

## Conflict of Interest

There is no conflict of interest between the authors.

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