The effect of stress levels of nurses on performance during the COVID-19 pandemic: the mediating role of motivation

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Abstract

Background: During the COVID-19 pandemic, it is thought that nurses working at more intensive levels and in high-risk areas may increase their stress and decrease their motivations and performance.

Aims: This study aimed to determine the effects of stress and work stress on nurses' motivations and performances.

Methods: An online, cross-sectional survey, which used self-assessment scales to measure perceived stress, perceived work stress, motivation, and work performance was used as a data collection tool. The target population was all working nurses in a hospital.

Results: One hundred and fourteen nurses completed the questionnaires. The results of the study show that the participants' perceived motivation level (3.131 ± 0.685), perceived stress level (2.885 ± 0.547), and perceived job stress level (3.202 ± 1.067) were at a medium level, while their perceived performance level (3.845 ± 0.783) was at a high level. According to correlation analyses results, increases in perceived stress levels of nurses decrease their motivations ($r = -0.502$) and performances ($r = -0.603$). Similarly, increases in perceived work stress levels of nurses decrease their motivations ($r = -0.441$) and performances ($r = -0.534$). According to the Structural Equation Modelling (SEM) analysis, motivation has a mediating role in the negative effect of

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perceived stresses on performance (β = −0.694) and augments such negative effect (β = −0.169). Similarly, motivation has a mediating role in the negative effect of perceived work stresses on performance (β = −0.295) and increases the negative effect of perceived work stress on performance (β = −0.097).

Conclusions: Nurses' perceived stress and perceived work stress levels were not high, but an increase in these variables may decrease nurses' motivation and performance. Thus, controlling nurses' stress levels and identifying possible stress sources related to the COVID-19 pandemic are important to support nurses in their work.

Keywords
COVID-19 pandemic, nurses' motivation, nurses' perceived work stresses, nurses' performances, nurses' stress levels

Introduction

Coronavirus disease-2019 (COVID-19) has spread rapidly worldwide, has affected thousands of people, and a high number of patients have died; thus, COVID-19 has been declared a pandemic disease by the World Health Organization (2020). Since a definitively successful treatment for COVID-19 has not yet been developed, people are largely helpless against the virus and can only protect themselves by taking precautions. Globally, the coronavirus carries a high risk of death because of its high spread rate (Ahorsu et al., 2020; Rezaeetalab et al., 2020). This situation creates serious fear worldwide.

Nurses are at the forefront of the treatment of patients, so they can be affected more emotionally because they face more risks and establish a closer relationship with the patients than other healthcare personnel. With the COVID-19 pandemic, many factors should be considered for healthcare workers, such as providing direct care to infected patients, staying away from their families and friends, working under intense conditions, working in a stressful work environment, and increasing stress levels. Moreover, such stress may affect healthcare workers' performance of their tasks. In the present pandemic, considering the chaotic environment and excessive workload on the healthcare workers, it is thought that the motivations and performances of healthcare workers may be negatively affected. For this reason, this study aimed to determine the effect of perceived stress and perceived work stress experienced by nurses on their motivation and performance.

Background

Individuals with COVID-19 experience severe respiratory distress that requires hospitalisation, but those with severe disease further need intensive care. Increased demands on health services cause healthcare workers to work overtime (Xiao et al., 2020). Due to the pandemic, such an increase in workload has revealed various situations among healthcare workers, such as the inability to have adequate rest, exposure to many patients with COVID-19, and an increase in the risk of healthcare workers of becoming infected (Wang et al., 2020). These risks also affect the mental status of healthcare workers because they have to stay away from their family and friends to prevent transmission (Kang et al., 2020).

Stress is defined as the introvert reaction of individuals to situations that they perceive as a threat or difficulty throughout their lives (Özel and Karabulut, 2018). Stress can affect people depending

on various reasons (stressors). Some of these reasons may be related to the individual, to the environment in which the individual resides, and to the general environment in which the individual lives (Şanli, 2017).

As in previous pandemic periods, the COVID-19 pandemic is an important risk factor for healthcare workers (Spoorthy et al., 2020), especially for nurses (Huang et al., 2020). Anxiety about deaths of families, colleagues, and patients can cause stress among healthcare workers (Cai et al., 2020). During the pandemic period dominated by a high risk of death and an environment of uncertainty, it is quite common for healthcare workers to increase their stress levels. Stress negatively affects both mental and physiological health (Demirci et al., 2013). The reflection of stress on work status varies, but can cause serious problems in the health sector.

The stress can cause unwillingness to work, reluctance to go to work, making mistakes, leaving work, poor quality of work, deterioration of relationships and cooperation with colleagues, making inaccurate decisions, and negative behaviours (Aksoy and Kutluca, 2005). The effects of work stress on the health sector may cause irrecoverable results. Literature data indicate that nurses' stress affects their motivation and performance negatively (Abu Al Rub and Alzaru, 2008; Al-Khasawneh and Futa, 2013).

Motivation is defined as employees' acting in line with a goal that reflects their desires and wishes (Özdemir and Muradova, 2008). Motivation is divided into two types: internal and external. Internal motivation is the motivational state that emanates from one's motivation to work (Uludağ, 2019), while external motivation occurs with factors such as wages, promotions, and appreciation by managers for one's work performance (Aslan and Doğan, 2020). Employees can be motivated to achieve organisational goals based on the internal and external motivation factors. To achieve organisational goals, employees must have high work performance (Ağirbaş et al., 2005). Work performance is directly related to motivation, which, in turn positively affects work performance (Zameer et al., 2014).

Many factors affect the motivation of nurses. Some of these can be identified as nurse's participation in organisational decisions, importance of nursing, fair discipline, and enjoying their profession (Hakmal et al., 2012). Nurses find their job attractive, and appreciation of their work is one of the factors that affects their motivation (Hanks, 1999). Nurses' motivation to do their job enables them to be friendly towards the patients and their relatives, show care required by the nursing professions, manifest behaviours required by the health sector, and enjoy being useful to others (Öztürk et al., 2019). Motivated nurses may contribute positively to organisational performance and patient satisfaction.

Performance is another concept associated with stress and motivation. Moreover, nurse performance is an important factor in ensuring patient care, satisfaction, and safety (Terzioğlu et al., 2016), and it is directly related to the efficient, productive, and uninterrupted provision of healthcare (Top et al., 2010). Nursing is one of the career groups that requires high performance (Amarat et al., 2018). Studies have indicated that nurses' performance is affected by environmental conditions (Yildiz et al., 2014) and their personality (Yeh et al., 2016). A study concluded that negative conditions, such as feeling tired, burnout, and loss of motivation, together with stress caused by working conditions and processes, may affect their performance (Imirlioğlu, 2009). Decreasing the workload of nurses, increased participation in clinical decisions, fair approaches in arranging shifts and leave, provision of more job opportunities, and improving personal rights are known factors that will increase nurses' performance (Top et al., 2010).

Health services are needed much more during the pandemic process. This need has increased the workload of nurses and made working conditions even more unsafe. With the pandemic, nurses work

more intensely and are at increased risk, their motivation and performance are reduced, and work stress levels amplified. Inevitably, these negative conditions among nurses will negatively affect patient care.

From all this information, the study's hypotheses are as follows:

H1. Nurses' perceived stress levels affect their motivation.

H2. Nurses' perceived stress levels affect their performance.

H3. Motivation has a mediating role in the effects of perceived stress levels on nurses' performance.

H4. Nurses' perceived work stress affects their motivation.

H5. Nurses' perceived work stress affects their performance.

H6. Motivation has a mediating role in the effects of perceived work stress on nurses' performance.

Materials and methods

Participants and sampling

In this cross-sectional study, the study sample was composed of 330 nurses working in Tokat Gaziosmanpaşa University Research and Application Hospital. This study aimed to obtain the whole population of the university hospital, but only 120 (36.36%) participants filled in the questionnaires. Since six of the participants did not fill out the entire questionnaire, these questionnaires were not used in the analysis. In this context, the sample of the study consisted of 114 (34.55%) nurses.

Survey methods and data collection

Data were collected by an online survey method. The online survey link was delivered to the participants in various ways (WhatsApp, SMS, mail, etc.). Before the study, permissions and approvals were obtained from the Ethics Committee of the University of Sakarya (19/05/2020-E.4577), Turkey Scientific Research from the Ministry of Health (2020-05-05T23_20_16), and the hospital's management. The questionnaires were collected between May 29, 2020, and June 28, 2020.

Measurements

In the study, survey technique was used as the data collection method. The questionnaire consisted of five parts as follows:

(1) Demographic information: There were four questions on age, sex, education level, and professional experience of the employees.
(2) Perceived Stress Scale: This scale was developed by Cohen et al. (1983). The Turkish validity and reliability study was conducted by Eskin et al. (2013). The scale consists of 14 expressions and is designed to measure how stressful some situations in a person's life are perceived to be. The scale consists of two dimensions, but in the present study, the scale

dimensions were not used. Participants evaluated each item on a 5-point Likert scale, ranging from 1 as "never" to 5 as "very often". Seven of the items containing positive statements are scored in reverse order.

(3) Perceived Work Stress Scale: The scale was developed by Rizzo et al. (1970) to measure perceived work stress, and it was adapted in Turkish by Gül (2007). The scale consists of five expressions and has a 5-point Likert structure, with a score of 1 indicating "strongly disagree" and 5 as "strongly agree."

(4) Motivation at Work Scale (MAWS): MAWS consists of four dimensions and 12 expressions, and the validity and reliability analyses of the English and French versions were performed by Gagné et al. (2010). The Turkish validity and reliability study was performed by Akbolat and Işik (2012). The motivation scale was designed as having four factors, but in the present study, the scale was considered as a single dimension of examining the general level of motivation. The scale has a 5-point Likert structure, with a score of 1 presenting "strongly disagree" and 5 presenting "strongly agree."

(5) Performance Scale: The scale was developed by Ergun (2008) and aimed to determine the individual performance perceptions of the participants. The scale has nine items. Additionally, the scale aims to determine the perception of poor performance; all scale expressions are reversed. The scale has a 5-point Likert design, with a score of 1 indicating "strongly disagree" and 5 indicating "strongly agree."

All these scales were used during self-assessments by the participants.

Statistical methods

SPSS Statistics version 22 was used in the data analysis. Data were analysed using descriptive statistical methods, correlation analysis, and Process Macro Model 4 Structural Equation Modeling (SEM). Data were analyzed at 95% confidence interval.

Results

All of the participants were nurses. The mean age of the participants was 30.38 (±6.98) years, which varied from 21 and 61 years. The average professional experience was 7.71 (±6.08) years, which varied between 1 and 35 years. A total of 114 participants were enrolled in the study, comprised of 48 men and 66 women. Most of the participants were undergraduate (73), and the remaining were at high school (21) and graduate (20) levels. Fourteen of the nurses participating in the study worked in the emergency room, 10 in the operating room, 30 in the intensive care unit, and 60 in the inpatient service.

Table 1. Correlation analysis and descriptive statistics.

Variables	1	2	3	4	Mean	SD	Cronbach's alpha
1. Motivation	1,00				3.131	0.685	0.851
2. Performance	.478[a]	1.00			3.845	0.783	0.844
3. Stress	−.502[a]	−.603[a]	1.00		2.885	0.547	0.851
4. Work stress	−.441[a]	−.534[a]	.669[a]	1.00	3.202	1.067	0.886

SD: standard deviation.
[a]Correlations are significant at the 0.01 level.

The results of the reliability analysis of the scales are presented in Table 1. The reliability values of the scales are all >0.80, which means that the scales have high reliability.

Results of the correlation analysis between research variables are shown in Table 1. The stress levels of nurses are inversely related to motivation ($r = -0.502$) and performance ($r = -0.603$). While the stress levels of nurses are increasing, their motivation and performance are decreasing. Similarly, nurses' perceived work stresses are inversely related to motivation ($r = -0.441$) and performance ($r = -0.534$). While the stress that nurses perceived about their work increases, their motivation and performance decrease (Table 1).

On five-point Likert scales it is possible to examine the average in three categories as 1.00–2.33 (low), 2.34–3.66 (medium) and above 3.67 (high) (Dilek et al., 2018). According to this, the perceived motivation level, perceived stress level and perceived job stress level of the participants are at a medium level, while the performance level is at a high level.

SPSS PROCESS Macro Model 4 was used to reveal the effect of stress on job performance and the mediating role of motivation. Details of the analysis results are shown in Figure 1.

The results of the analysis reveal that perceived stress negatively affects work performance ($\beta = -0.694$) and motivation ($\beta = -0.629$) and motivation affects performance ($\beta = 0.268$) positively. Moreover, motivation mediates the effect of perceived stress on the performance and strengthens the negative effect of perceived stress on performance ($\beta = -0.169$). According to these results, **H1**, **H2**, and **H3** hypotheses are accepted.

SPSS PROCESS Macro Model 4 was used to reveal the effect of perceived work stress on job performance and the mediating role of motivation in this effect. Details of the analysis results are shown in Figure 2.

The results of the analysis presented that perceived work stress negatively affects work performance ($\beta = -0.295$) and motivation ($\beta = -0.283$) and that motivation affects performance ($\beta = 0.344$) positively. Moreover, motivation mediates the effect of perceived work stress on performance and increases the negative effect of perceived work stress on performance to a small extent ($\beta = -0.097$). Similar to model 1, model 2 shows that motivation alone affects performance
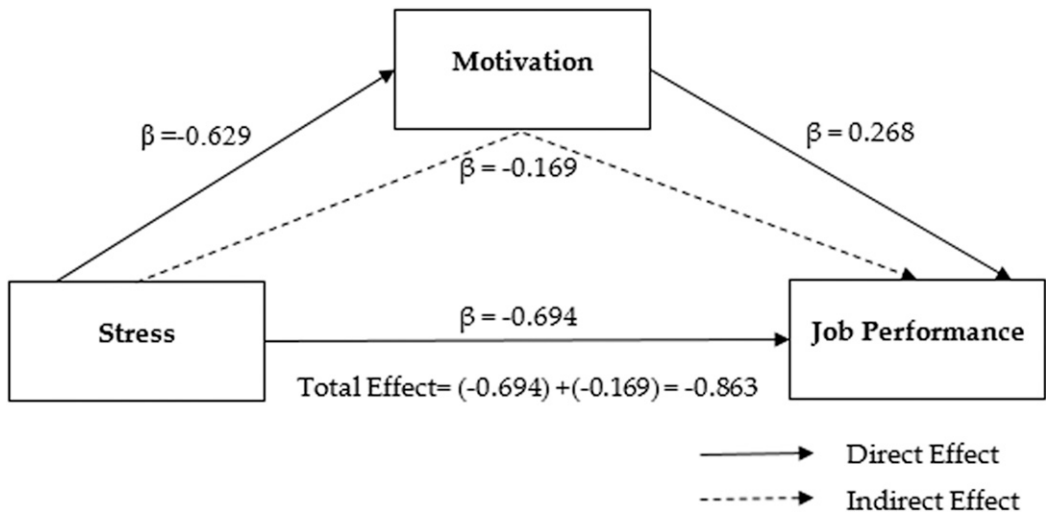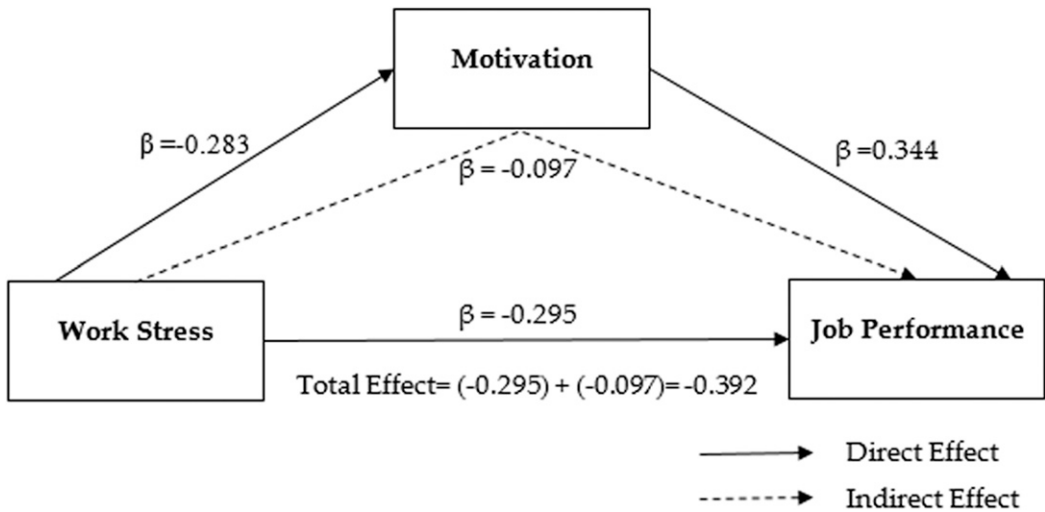

Figure 1. Results of model 1.

Figure 2. Results of model 2.

positively. However, perceived work stress lowers motivation, and low motivation decreases with perceived work stress. According to these results, **H4**, **H5**, and **H6** hypotheses are accepted.

Discussion

The COVID-19 pandemic has caused an increase in the working hours, workload, and stress levels of healthcare workers, especially nurses (Cai et al., 2020). The results of this study revealed that the perceived stress levels and work stresses of nurses were middle level during the COVID-19 outbreak. According to studies conducted during the COVID-19 pandemic, the stress levels of doctors and nurses were moderate level (Xiao et al., 2020), the work stress level of nurses was below the middle level (Mo et al., 2020). A recent study revealed that only 5.2% of 906 healthcare professionals working during the COVID-19 pandemic experienced stress (Chew et al., 2020). This condition can be explained by the uncertainty inherent in the profession of healthcare workers and their familiarity with this uncertainty. In addition, the high ethical principles of healthcare workers may play a role in suppressing the stress level which they feel. The results of the present study reveal that the higher perceived work stress of nurses may be related to the uncertainty in health services during the COVID-19 pandemic.

The results from this study show that the motivations of the nurses working in the frontline of the COVID-19 pandemic are at a medium level and their perceived performance levels are high. A study supposed that the ambiguous and uncontrollable nature of the health services during a pandemic and the fact that nurses have to stay away from their families may affect their psychological status (Mo et al., 2020). This situation negatively affects the motivation of nurses. Furthermore, the fact that nurses devote themselves to their professions and provide health services by exposing their own lives may affect their perceived performance positively.

According to the results, when the stress and perceived work stress levels of the nurses increased, their motivation and performance decreased. This result highlights that nurses' stress can negatively affect their service delivery. Some studies have supported these findings. Abu Al Rub et al. (2008) conveyed an inverse relationship between nurses' perceived work stresses and performances, and

Al-Khasawneh and Futa (2013) reported that some stressors decreased the performance of nurses, while affecting motivation and performance negatively.

While nurses' stress and work stress negatively affect their performance, low motivation further decreases their performance. The study results present a positive relationship between motivation and performance. In this case, low motivation due to perceived stress and perceived work stress causes a decrease in performance as well. Similar to the results obtained from the present study, a study conducted in different sectors reported that motivation mediates the effect of stress on performance and strengthens the negative effect (Zeb et al., 2015).

Limitations of the study

The study was carried out in a single centre and the number of participants in the study was low. This shows that the study is generalisable only for the relevant hospital. Therefore, this study can be defined as a pilot study. Study data were collected using an online survey technique. This technique allows participants to answer questions when they are available, but does not allow the participant to ask directly about unclear items. The most important study limitation is that self-reported scales are used. In this case, the participants can express what "they should be," which shows social bias. There are important studies on this subject, but comprehensive studies are needed to raise awareness (Van de Mortel, 2008).

Conclusions

At present, COVID-19 directly threatens public health. As an important part of the society, healthcare workers, especially nurses, are adversely affected by this pandemic. Therefore, empirical studies are important to reveal their psychological states and the possible consequences hereof. From this aspect, the present study reveals the effects of health workers' stresses and work stresses on their motivations and performances.

The results of the study provide some valuable and useful information for nursing management. First, nurses' stress levels at the time of this study during the pandemic were still moderate. Additionally, it is very important to keep the stress levels of the nurses under control so that health services can be provided without any disruption. From this study, nurse managers should take precautions to maintain the stress levels of nurses at this level by taking into consideration the pandemic process and institutional structures. Moreover, increasing stress of nurses affects their motivation and performance negatively. Therefore, offering psychological support to nurses and arranging their working hours as suitably as possible are necessary.

Key points for policy, practice and/or future research

- The increasing work stress of nurses affects their motivation and performance negatively.
- The increasing stress of nurses affects their motivation and performance negatively.
- Motivation reduces the strength of the negative effects of stress and work stress on performance.
- Nurse managers need to take measures to reduce stress and work stress and increase motivation to increase the performance of nurses.
- More studies are needed on the stresses of nurses during the COVID-19 pandemic process.

Author contributions

Study conception and design: ÖÜ, HT
Data collection: MA
Data analysis and interpretation: ÖÜ
Drafting of the article: ÖÜ, HT, MA
Critical revision of the article: HT, MA

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Data accessibility statement

The data that support the findings of this study are available from the corresponding author, [author H.T.], upon reasonable request.

Ethics

Before the study, permissions and approvals were obtained from the Ethics Committee of the University of Sakarya (19/05/2020-E.4577), Turkey Scientific Research from the Ministry of Health (2020-05-05T23_20_16), and the Commission of the hospital's management. The research conforms to the provisions of the Declaration of Helsinki (as revised in Brazil, 2013). All participants gave informed consent for the research, and that their anonymity was preserved.

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