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# Factors Related to Work Stress in Nurses of COVID-19 Patients at Pandan Arang Boyolali Hospital

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**Abstract**

The results of a preliminary study conducted on nurses at Pandan Arang Hospital, Boyolali Regency, showed that 80% of nurses who handled COVID-19 patients had been confirmed positive for COVID-19. 75% of them experience work stress, preliminary survey results show that concerns about being infected with COVID-19 and increasing workloads are the main factors for work stress among nurses. This study aims to analyze what factors are related to work stress in nurses who provide services to COVID-19 patients at Pandan Arang Boyolali Regional Hospital. The study utilized a cross-sectional approach. The sample consisted of 76 nurses in the COVID-19 care unit determined through total sampling. Data collection was conducted using questionnaires, and data analysis was performed using bivariate analysis. The results of the multivariate analysis showed that job conflict (B = 1.636, p < 0.001) and family conflict (B = 0.634, p < 0.001) had a significant effect on work stress, while age, gender, and education level did not show a significant relationship with work stress (p > 0.05). The practical implication of this study is the importance of managing job conflict to reduce work stress.

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## INTRODUCTION

At the beginning of 2020 in the world, there was an outbreak of the coronavirus (COVID-19) which infected almost all countries in the world (Huang & Zhao, 2020). As of April 2, 2020, China's National Health Commission has reported 81,620 confirmed cases of Covid 19 and resulted in the death of 3,322 individuals (Wang et al., 2020). The COVID-19 transmission rate is quite high, with 2,732,709 people diagnosed worldwide at the end of April 2020, covering 184 countries around the world. The number of deaths continues to increase, with a death rate of 6.95%, exceeding the number of SARS cases around the world, including Indonesia, which is also badly affected by COVID-19 where the death rate reaches 8.9%. (Machi et al., 2021; Sukmana et al., 2020)

Central Java ranks 3rd with the most COVID-19 cases after DKI Jakarta and West Java. Since the first COVID-19 cases in Indonesia were announced on March 2, 2020, to December 31, 2021, there have been 4,262,720 confirmed cases in Indonesia. The highest number of confirmed cases were reported from DKI Jakarta Province (865,297 cases), West Java (708,852 cases), and Central Java (486,916 cases). (Indonesian Health Profile, Ministry of Health 2021). The number of confirmed COVID-19 cases in Boyolali Regency from 2020 to 2021 was 24,353 cases (Boyolali Regency Health Profile 2021). The number of COVID-19 patients at Pandan Arang Hospital from 2020 to 2021 was 3,775, and as many as 673 cases were reported to have died (Boyolali Regency Health Profile 2021).

The difficulty of handling patients indicated by the coronavirus is experienced by all countries in the world, including Indonesia. This condition is exacerbated by the lack of health facilities and people who are not compliant with health protocols (Ilpaj & Nurwati, 2020) which resulted in the positive rate continuing to increase by more than a thousand cases per day and the death cases still the highest in Southeast Asia with a percentage of 9.11% (Olivia et al., 2020; Putri, 2020).

This condition forces Health Workers (Nakes) to work hard and quickly in handling each case so that the transmission does not spread further, every patient can recover, and there are no more cases of death due to the coronavirus. Health workers who are at the forefront of handling outbreaks are also exhausted and it is not uncommon for health workers to have to sacrifice their lives in dealing with this pandemic situation (Wang et al., 2020). Health workers have an important role in controlling and eliminating diseases, including in the COVID-19 pandemic situation (Efriana et al., 2021).

Nurses play an extraordinary role in dealing with COVID-19 among all health professionals. Nurses exert intensive efforts by risking their lives in the Emergency Department (ER), infection control unit, intensive care unit, and COVID-19 patient ward. They show commitment to the profession and patients (Catton, 2020). Psychological problems were also rampant among health workers during the COVID-19 pandemic. The influence of negative information and involvement in frontline duties seems to be the main risk factors that have an impact on psychological problems in the form of stress experienced by health workers (Dai et al., 2020; Que et al., 2020).

The high number of transmission cases and death cases due to COVID-19 resulted in stress levels of 33%, anxiety as much as 31%, depression of 30.7%, and relevant results leading to the incidence of Post Traumatic Stress Disorder (PTSD) as much as 33% of 534 health workers working in family clinics in Croatia (Vlah Tomičević & Lang, 2021). In the research Arafa et al (2021), it was found that nurses in hospitals in Egypt and Saudi Arabia experienced depression as much as 69%, 58.9% anxiety, and 37% experienced sleep disturbances since the COVID-19 pandemic. The condition of nurses in Boyolali Regency during the COVID-19 pandemic contracted the disease (Boyolali Regency Health Office, 2021)

Fear in nurses appeared as much as 16.1% classified as severe fear while 78.1% included in moderate fear in 411 frontline workers of COVID-19 in several hospitals in Egypt which caused job satisfaction to decrease and desire to leave work increased (Abd-Ellatif et al., 2021). Among health workers, nurses were found to have the biggest psychological problems as a

result of the COVID-19 outbreak (Carriero et al., 2021; Labrague & de Los Santos, 2021; Saragih et al., 2021). Sleep disorders, anxiety, depression, and post-traumatic stress are all negative consequences experienced by nurses during the pandemic (Labrague & de Los Santos, 2021; Saragih et al., 2021) (Mollica & Fricchione, 2021).

Research Anfajaya & Rahayu, 2020 stated that one of the factors that affect work stress is the organizational factor in which there is an overview of the workload. Workload is a set of the number of activities that must be completed by an organizational unit in a certain period (Rolos et al., 2018). The number of tasks carried out by employees is the cause of work stress experienced by employees, because of the limited time employees have to complete their tasks (Hu et al., 2020; Inayah et al., 2020; Irawati & Carollina, 2017; Mo et al., 2020; Wang et al., 2020)

The results of the study by Handayani et al., (2020) stated that factors related to the incidence of work stress in health workers are workload, negative stigma of virus carriers, and being away from family. The results of the study Budiyanto et al., (2019) stated that the factors related to the incidence of work stress in health workers were workload and facilities or infrastructure, while organizational climate, nursing supervision, and work discipline were not related to the incidence of work stress in health workers.

The results of a preliminary study conducted on 20 nurses at Pandan Arang Hospital, Boyolali Regency showed that 80% of nurses who handled COVID-19 patients had been confirmed positive for COVID-19. 75% of them experience work stress, the results of the initial survey show that concerns about being infected with COVID-19 and increased workload are the main factors for work stress in nurses. 60% of COVID-19 patient nurses reported that they had to leave family activities to accommodate the responsibilities of caring for COVID-19 patients during the pandemic.

This study is compared to research from Handayani et al., (2020) and Budiyanto et al., (2019) and lies in the variables of work conflict, family conflict, worry about being infected, and social support. Work conflicts and work stress have a negative influence on nurses' performance, meaning that the higher the nurse experiences work conflict and the higher the stress, their performance will decrease significantly, and vice versa. Work conflicts can cause stress which will also indirectly affect job satisfaction. Family conflicts will trigger work stress. Excessive family demands can hinder the fulfillment of work demands, or conversely, tight schedules and work demands can be an obstacle in meeting family demands. For example, when a child is sick, the parents become not concentrating on work, which may even cause the parents to miss work

The fears of being infected that health workers feel are fear of being exposed, fear of getting infected, and fear of infecting others or their families. Many health workers have to isolate themselves from their families and loved ones even though they do not experience COVID-19. This is a difficult decision and can cause a psychological burden, namely significant stress on health workers. The less social support an individual gets, the higher the level of work stress he or she experiences. Work-related stress, one of which is caused by a lack of social support from management and colleagues. Nurses with low social support will experience uncomfortable working conditions due to less harmonious relationships. Low social support will affect a person's level of work stress. Based on the descriptions in the background above, it is necessary to study factors related to work stress in nurses of COVID-19 patients at Pandan Arang Boyolali Hospital.

## METHOD

This type of research is a quantitative descriptive research with a cross-sectional study design. Research to study variable dynamics in descriptive form by means of approach, observation, or data collection at once at a time (point time approach). The population in this study is all nurses working in the COVID-19 care unit, namely 76 nurses. The sampling technique in this study was carried out with a type of non-probability sampling, which is a type of sample that is not randomly selected, and not all elements or elements of the population have the

same opportunity to be selected as samples. This sampling technique is used in accordance with the method of determining the number of samples, namely by the census method or saturated sampling. This sampling was carried out to obtain specific information so that in this study the final sample number was 76 nurses in the COVID-19 treatment unit. The dependent variables in this study were work stress, while the independent variables were age, gender, education, workload, work conflicts, family conflicts, anxiety about being infected, and social support. Data was collected using questionnaires. Multivariate data analysis using linear regression test using SPSS device. This research is registered with the Health Research Ethics Commission of Universitas Negeri Semarang with number 123/KEPK/EC/2023.

## RESULTS AND DISCUSSIONS

**Table 1**. Frequency Distribution of Nurse Characteristics at Pandanarang Regional Hospital, Boyolali (n = 76)

| Characteristics | F | % |
|---|---|---|
| **Gender** | | |
| Male | 12 | 15.8 |
| Female | 64 | 84.2 |
| **Education Level** | | |
| Diploma in Nursing (D3) | 55 | 72.4 |
| Bachelor of Nursing (S1) | 12 | 15.8 |
| Bachelor + Ners Profession | 9 | 11.8 |
| **History of Confirmed COVID-19** | | |
| Ever Infected | 56 | 73.7 |
| Never Infected | 20 | 26.3 |
| **History of Performing Contact Tracking Activities** | | |
| Ever | 52 | 68.4 |
| Never | 24 | 31.6 |
| **Frequency of Contact Tracking Activities** | | |
| 1–2 days | 14 | 18.4 |
| ≥ 3 days | 62 | 81.6 |

The data show that most nurses at Pandanarang Regional Hospital are female and hold a Diploma in Nursing as their highest education level. A large proportion have experienced COVID-19 infection and have participated in contact tracking activities, with the majority conducting such activities for three or more days.

**Table 2.** Results of Pearson Product Moment Correlation Analysis of Factors Related to Work Stress in Nurses of COVID-19 Patients

| Variable | *p.value* | *r* | *R2* |
|---|---|---|---|
| Age - Work Stress | 0.704 | - | - |
| Workload - Work Stress | 0.039* | 0.237 | 5.6% |
| Work Conflict - Work Stress | <0.0001** | 0.977 | 95.5% |
| Family Conflict - Work Stress | 0.008** | 0.302 | 9.1% |
| Concerns About Being Infected with COVID-19 - Work Stress | <0.0001** | 0.531 | 28.2% |
| Social Support - Work Stress | 0.050* | 0.226 | 5.1% |

**p-value≤0.05; ** P-value<0.01*

Base on table 2, result showed of the univariate analysis should be presented initially analysis showed that there was no significant correlation between age and work stress because the p-value was far above 0.05. This shows that age is not a factor that affects the level of work stress. There is a weak positive correlation between workload and work stress. The higher the workload score, the higher the work stress score, 5.6% of the work stress score is influenced by workload, and the remaining 94.4% is influenced by other factors. There is a very strong positive correlation between work conflict and work stress. The higher the work conflict score, the higher the work stress score, 95.5% of the work stress score is influenced by work conflict, the remaining 4.5% is influenced by other factors. There is a moderate positive correlation between conflicts families with work stress. The higher the family conflict score, the higher the work stress score, 9.1% of the work stress score is influenced by family conflicts, and the remaining 90.9% is influenced by other factors. There is a moderate positive correlation between the fear of being infected with COVID-19 and work stress. The higher the worry score, the higher the work stress

score, 28.2% of the work stress score is influenced by the worry of being infected, and the remaining 71.3% is influenced by other factors. There is a weak positive correlation between social support and work stress. The lower the social support provided, the higher the work stress value, 5.1% of the work stress value is influenced by lack of social support, 94.9% is influenced by other factors.

Table 3. shows that the gender variable (p= 0.853) and the education (p= 0.111) did not show a significant difference in the average stress score.

**Table 3.** Results of Analysis of Catogaric Data Factors Related to Work Stress in Nurses of COVID-19 Patients

| Variable | N | P-Value of Normality Results | *Mean Rank* | *p-value* |
|---|---|---|---|---|
| **Gender** | | | | |
| Man | 12 | 0.515** | 37.42 | 0.853# |
| Woman | 64 | 0.017* | 38.70 | |
| **Education Level** | | | | |
| D3 Nursing | 55 | 0.004* | 36.57 | 0.111## |
| S1 Nursing | 12 | 0.108** | 50.63 | |
| Profession | 9 | 0.350** | 34.11 | |

**Table 4.** Results of Dunnett T3 Post Hoc Analysis for Differences in Work Stress Levels by Last Education

| (I) Last Education | (J) Last Education | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| D3 Nursing | S1 Nursing | -13.203 | 5.935 | 0.107 | -28.63 | 2.22 |
| | Profession | -2.259 | 9.191 | 0.992 | -28.24 | 23.72 |
| S1 Nursing | D3 Nursing | 13.203 | 5.935 | 0.107 | -2.22 | 28.63 |
| | Profession | 10.944 | 10.068 | 0.633 | -16.32 | 38.20 |
| Profession | D3 Nursing | 2.259 | 9.191 | 0.992 | -23.72 | 28.24 |
| | S1 Nursing | -10.944 | 10.068 | 0.633 | -38.20 | 16.32 |

**Table 5.** Results of Analysis of Main Factors of Work Stress in Nurses of COVID-19 Patients

| Variable | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | *p-value* | B | *p-value* | B | *p-value* | B | *p-value* | B |
| Occupational Conflicts | <0.001 | 1.637 | <0.001 | 1.635 | <0.001 | 1.621 | <0.001 | 1.636 |
| Family Conflict | 0.001 | 0.585 | 0.001 | 0.560 | <0.0001 | 0.589 | <0.001 | 0.634 |
| Workload | 0.255 | 0.342 | 0.167 | 0.398 | 0.159 | 0.404 | | |
| Concerns about being infected with COVID-19 | 0.441 | 0.095 | 0.519 | 0.078 | | | | |
| Social Support | 0.494 | 0.037 | | | | | | |
| Constant | <0.001 | 15.820 | <0.001 | 16.146 | <0.001 | 15.993 | <0.001 | 16.513 |

There was no statistically significant difference in the level of work stress among nurses with the last level of education D3 Nursing, S1 Nursing, and Profession. Value p (sig.) for all comparisons greater than 0.05.

The results of linear regression analysis showed that occupational conflict had a significant and positive influence on occupational stress in nurses of COVID-19 patients in all four models (B = 1,636; p < 0.001), the coefficient for occupational conflict was 1,636, meaning that every increase of one unit in occupational conflict would increase occupational stress by 1,636 units. Family conflict also had a significant influence (B = 0.634; p < 0.001) suggesting that every increase in one unit in family conflict would increase work stress by 0.634 units. As for workload, concerns about being infected with COVID-19 and social

support did not show a significant influence in the linear regression analysis model ($p > 0.05$).

Work Stress Score Formula = 16.513 + 1.636 (work conflict score) + 0.634 (family conflict score). This study aims to explore and analyze the relationship between several independent variables (age, workload, work conflicts, family conflicts, concerns about being infected with COVID-19, and social support) and the main dependent variable, namely the level of work stress in nurses caring for COVID-19 patients. Linear regression analysis is used to identify the extent to which these variables can explain variations in work stress levels. The results of linear regression analysis in the final model show that the main factors of work stress in nurses caring for COVID-19 patients in this study are work conflict, and workload. Previous research has identified age as a factor affecting work stress levels in nurses. In general, the literature suggests that older nurses may experience lower levels of work stress because they have more experience in dealing with challenges and crises in a healthcare setting. However, the results of studies vary, and some studies suggest that the presence of work stress can decrease with age.

Age can affect the level of work stress in COVID-19 nurses, but the relationship is not direct. Some research suggests that older nurses may experience lower levels of work stress due to their experience in dealing with challenges and crises in the healthcare environment (Moya-Salazar et al., 2023). However, other research suggests that younger nurses may be more negatively impacted by the pandemic and experience higher levels of burnout (Casafont et al., 2021; Karakurt et al., 2023; Rohita et al., 2023).

A study conducted on 100 nurses found that the youngest age group, 20-30 years old, had an average burnout syndrome (BS) highest with 53.8 points (SD 4.18) (95% CI: 52.79 to 54.8) (Hu et al., 2020). Another study found that nurses over the age of 35 were less likely to experience work-related stress during the COVID-19 pandemic. However, a survey of nurses in the U.S. found that about 49.7% of nurses felt tired or exhausted, and 45.1% felt emotionally drained at work (Russell, 2023).

A study found that nurses over the age of 35 were less likely to experience work-related stress during the COVID-19 pandemic (Raveis et al., 2020). In addition, the survey revealed that more than 610,000 registered nurses with more than 10 years of experience and an average age of 57 years plan to leave the workforce in 2027 due to stress, burnout, or retirement (Russell, 2023). This suggests that even nurses with longer tenures may experience significant stress and associated consequences. The COVID-19 pandemic has had a significant impact on the work stress levels of nurses, with many nurses experiencing burnout and high-stress levels (Karakurt et al., 2023; Rohita et al., 2023; Russell, 2023).

The workload of nurses is a critical aspect that is often associated with high levels of stress. In the context of caring for COVID-19 patients, nurses often face extra workloads, such as increased patient numbers, additional safety protocols, and emotional challenges that may arise from caring for patients infected with the virus. Previous studies have shown that increased workload can be a trigger for stress, fatigue, and decreased psychological well-being in nurses. Nurses who handle COVID-19 patients experience tremendous psychological stress due to their workload in high-risk environments, leading to severe stress and work fatigue (Babamohamadi et al., 2023).

Job conflicts, especially in crowded and stressful hospital environments, can be a major contributing factor to work stress levels. Job conflicts can arise from mismatches between job demands, assigned tasks, and workers' expectations of their jobs. Policy changes, uncertainty, and lack of support in addressing workloads can lead to significant job conflicts. Research shows that the main causes of stress among nurses in the workplace include work shifts, long working hours, poor relationships with coworkers, and unfavorable working conditions. Work stress can lead to conflicts with coworkers, intense displacement, poor health, inability to complete tasks, vulnerability in professional communication, low-quality care, and dissatisfaction with their careers (Babamohamadi et al., 2023). In addition, work stress has been linked to quitting work, co-worker conflicts, health problems, job dissatisfaction,

reduced creativity, and decreased professional behavior (Babapour et al., 2022).

Family conflicts can also have a major impact on nurses' work stress levels. A high workload at work can result in a lack of time and energy left for the family, creating an imbalance between work life and personal life. These conflicts can trigger high levels of stress, with a negative impact on the psychological and physical well-being of caregivers. High levels of work-family conflict are also known to affect nurses' physical, mental, and psychological health, as well as their job satisfaction and performance (Karakurt et al., 2023).

The COVID-19 pandemic has brought a new dimension to the work stress of nurses. The worry of being infected on its own can be a significant source of stress. Nurses caring for COVID-19 patients may experience concerns about the risk of transmission, personal safety, and potential impacts on their health and that of their families. Social support has proven to be a strong protective factor against work stress levels. Support from coworkers, employers, and family can help nurses cope with stress and provide emotional support and practical resources in coping with tasks. Social support has proven to be a strong protective factor against work stress levels among nurses.

Social support felt from co-workers was shown to improve reported levels of job performance and lower reported levels of work stress among hospital nurses. In addition, social support has been identified as an important resource in the context of nursing work, with beneficial effects on well-being, reducing role stress, and increasing job satisfaction. In addition, higher levels of social support have been associated with lower levels of psychological distress, such as stress, depression, and anxiety, among nurses (AbuAlRub, 2004).

The limitations of this study include the determination of the sample this study is a total sampling of 76 nurses so the generalization of results in other hospitals may be different, the limitations of the data collection method with the use of questionnaires as the main method of data collection can cause bias and inaccuracy due to the limitations of the answers that can be given by the respondents. The use of a cross-sectional approach may not be able to provide an in-depth understanding of changes in work stress over time. Longitudinal studies such as cohort method research can provide more comprehensive information, and the last is the limitation of local focus, namely this research is only conducted at Pandan Arang Hospital, Boyolali Regency, so the results may not be fully applicable to other contexts or different hospitals.

## CONCLUSION

The multivariate analysis indicates that work conflicts and family conflicts are the main factors influencing work stress among nurses caring for COVID-19 patients. Age shows no meaningful relationship with work stress, and no significant differences are observed based on gender or education level. Workload is weakly associated with work stress, with higher workloads tending to increase stress levels slightly. Work conflicts demonstrate a very strong positive relationship with work stress, while family conflicts show a moderate positive relationship. Fear of contracting COVID-19 also has a moderate positive relationship with stress, and lower social support is weakly associated with higher stress. These findings suggest that both individual and organizational efforts are needed to address these stressors. Providing stress management training—such as relaxation techniques, time management, and effective communication—may help nurses better cope with the challenges they face in their daily work.

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