



Exploring Nurses' Perceptions of their Workload at Coronavirus Disease 2019 Isolation Ward in Jakarta, Indonesia: A Qualitative Study

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Abstract

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BACKGROUND: Coronavirus disease 2019 (COVID-19) is a problem faced by all countries in the world. Health workers, who are on the frontline in dealing with patient, are at high risk of being infected. The large number of patients affected by COVID-19 potentialis causing an increasing burden on nurses caring for their patients. There is little research from qualitative studies on the workload of nurses caring for COVID-19 patients.

AIM: The purpose of this study is to explore the workload of nurses, including perceptions and influencing factors.

METHODS: Nine nurses taking care of patients with COVID-19 were selected using purposive sampling at a hospital in Jakarta, Indonesia. Data were collected through semi-structured interviews conducted online. Data saturation were achieved after interviewing nine nurses. This study adopts constant comparison analysis as developed by Glasser and Strauss.

RESULTS: The study resulted in eight categories and four main themes, including distribution of workload, workload increase factors, challenges, and expectations of nurses caring for COVID-19 patients.

CONCLUSION: The findings suggest that leaders and managers need to make policies that are fair to nurses so that they do not burden nurses with non-nursing care. They must also provide sufficient training for new nurses who will be assigned to the COVID-19 isolation ward.

Introduction

Coronavirus disease 2019 (COVID-19) is a problem facing almost all countries in the world. By Nov 23, 2021, more than 256 million confirmed cases and over five million deaths in the worldwide [1]. Up to November 15, 2021, according to the Indonesian Ministry OH Health, the number of active cases in Indonesia was 4.251.076 and there were 143.670 deaths [2]. Health workers as the front-line care provider for patients are at high risk of being infected by infectious disease [3]. The International Council of Nursing reports that at least 90.000 healthcare workers have been infected, and more than 260 nurses have died of COVID-19 in 60 countries until May 2020 [4]. Meanwhile, from December 2020, there was 572 healthcare worker died and 171 nurses who died due to COVID-19 in Indonesia [5].

The COVID-19 pandemic has had a major impact on the workload of nurses. Research in the Netherlands and Belgium showed an increase in the workloads of nurses as expressed by a higher nursing

activity score in the COVID-19 room [6], [7]. The workloads of nurses are increasing along with a high nurse-patient ratio (8). The increase in the workloads of nurses is caused by them being more committed to fulfilling personal hygiene, mobilization and positioning, family support, and respiratory care [8]. Complex procedures such as setting patient in a prone position or administering extracorporeal membrane oxygenation further increase nursing activities. The nurses also engage in more routine monitoring of patients, deal with environmental factors such as risk of exposure, and grapple with adverse events. This contributes to higher workloads than in non-COVID rooms [9].

Nurses' perception of the heavy levels of their workloads results in significant direct effects on patient and nurse outcome. Patient outcomes include medication errors, patient falls, and urinary tract infections. Nurse outcomes include emotional exhaustion and job dissatisfaction [10]. The impact of a high workload also causes fatigue in nurses and affects the quality of care and patient safety [11]. For those nurses who are clinical practice, its impact also has psychosocial ramifications. Nurses' have been reported

to undergo stress related to separation from family and heavy workloads created by health system demand and staff shortages [12].

In this unpredictable era of COVID-19, new factors can affect the workloads of nurses. There is very little research, especially qualitative studies, on nurses' perceptions of their workloads in a COVID-19 isolation room. Nurses' perceptions are influenced by nurses' experiences in doing their jobs; therefore, it is appropriate to use qualitative studies. This study aims to explore nurses' perceptions of workload in COVID-19 isolation rooms.

Methods

A qualitative study with an exploratory descriptive approach was conducted in this research. The participants were nurses who working a COVID-19 isolation ward. This study was conducted at the General Hospital in Jakarta, which is the largest COVID-19 referral hospital in South Jakarta. The participants were enrolled in the study using purposive sampling. The criteria for participants was having at least 1 month of experience working with COVID-19. Data were gathered online through semi-structured interviews at conducted using videos that were recorded during interviews at convenient times for the participants. Data were collected between November 2020 and March 2021. The researchers first requested data from the head nurse, who was contacted by the researchers to explain the goals and obtain the necessary consent from participants. The researchers then scheduled an interview appointment at a convenient time. Based on the data collection, the process stopped when data were saturated such that no new data were released by the participants. The duration of each interview was based on the participant's desire and experience. The interview ranged from 45 to 60 min. The main questions of the interview were as follows: "Please describe your activities in a day of taking care of patients in the ward." and "How do you feel about nursing activities during your working shift?" The researchers then asked "What do you mean?" or "Please explain on..." The researcher used probing questions until the goals were achieved. This study received an ethical review from the Faculty of Nursing, University of Indonesia number SK-181/UN2.F12.D1.2.1/ETIK, May 18, 2020, and from the hospital where the research was located. Before conducting interviews, informed consent was secured from all participants.

The analysis was conducted using the constant comparison approach to analysis developed by Glasser and Strauss [13]. After the interview, a verbatim transcript was generated. The transcript was then read repeatedly to determine coding. After deriving the coding from the transcript, the participants' opinions were grouped into

subcategories and then again into categories using the NVivo application. After identifying the categories, the same categories are grouped into main themes.

Results

Four men and five women served as participants in this study. The mean age was 34.8 ± 3.8 , and the mean work experience as 11.4 ± 6.8 years (Table 1). There are four main themes and eight categories (Table 2).

Distribution of workload

The results of the analysis show that the workload of nurses caring for COVID-19 patients is influenced by the division of work shifts and the arrangement of nurses' activities during the work period. The distribution of workloads consists of two categories, division of labor and cooperation.

Division of labor

The division of work is carried out by the nurse-in-charge, who divides nurses in the infection (red) and clean (green) zone into two groups based on each nurse's morning and afternoon shifts. The nurses in morning shifts are further divided into two groups, while those in night shifts are divided into three groups. The morning shift starts at 8–11 PM then changes roles in the green and red zones from 11 to 2 PM to reduce the workload, the division of labor is divided between the red zone and green zone rooms. The division of time to enter the red zone is between 3 and 4 h per group to reduce fatigue for nurses. The participants were quotes as saying the following:

"We have a division, a division of tasks, so after the handover, we implement the medicines and also the schedules, so every 2 h or 3 h there is a nurse who enters the isolation room" (P2)

"First of all, there was almost a month that I never slept at all. We did not sleep. So when we wanted to go to a group, there were still a few personnel who wanted to sleep. Suddenly the patient was bad, so what are we going to do again? That's how it used to be before, right, slowly, oh, it is like this, the rhythm is, oh, it works here. So we've shared it now. Alhamdulillah, the rhythm is already good. The rhythm is good. The group is also good. Like yesterday's fasting, the rhythm is already good, It depends on how we arrange it" (P9)

Cooperation

The results of the analysis show that nurses divide activities into zones, which consist of the red

Table 1: Characteristics of participants

| Code | Age | Gender | Marital status | Unit deployment | Role | Clinical level | Years of experience | Length of deployment (month) |
|------|-----|--------|----------------|-----------------|-----------------|----------------|---------------------|------------------------------|
| N1 | 36 | Male | Married | Isolation ward | Bedside nurse | CNL 2 | 14 | 9 |
| N2 | 32 | Female | Single | HCU COVID | Bedside nurse | CNL 1 | 4 | 9 |
| N3 | 44 | Female | Married | Isolation ward | Nurse in charge | CNL 3 | 27 | 5 |
| N4 | 32 | Male | Married | Isolation ward | Bedside nurse | CNL 1 | 10 | 8 |
| N5 | 33 | Female | Married | ICU Ventilator | Bedside nurse | CNL 2 | 10 | 6 |
| N6 | 34 | Female | Married | HCU COVID | Bedside nurse | CNL 2 | 11 | 5 |
| N7 | 32 | Male | Married | HCU COVID | Nurse in charge | CNL 1 | 2 | 10 |
| N8 | 36 | Male | Married | ICU Ventilator | | CNL 1 | 9 | 12 |
| N9 | 34 | Female | Single | ICU Ventilator | Bedside nurse | CNL 2 | 16 | 12 |

CNL: Clinical Nurse Level

zone (infected zone) and the green zone (clean zone). As it is known that nurses cannot directly provide care like they could under normal conditions, nurses divide up activities in the green zone and generally regulate interventions to be carried out on patients such as preparation for blood tests and swabs, preparing drugs, recording and documentation, observing vital signs through monitors, and contacting doctors and radiology officers. Activities inside the zone include observation, patient assessment, and all other actions relating to the patient.

Table 2: Themes, categories, and sub-categories

| Themes | Categories | Sub-categories |
|----------------------------------|--------------------------------|--|
| Distribution of workload | Division of labor | - Division of shifts - Division of groups |
| | Cooperation | - Activities inside (red zone) - Outdoor activities (green/clean zone) |
| Workload increase factors | Non nursing care factor | - Added tasks from other health care - Train new staff |
| | Over working capacity | - Nurses transferred to new COVID ward - Nurses must meet all patient needs |
| Challenge | Physical fatigue | - Using personal protective equipment - Nurse-patient ratio |
| | Psychological stress | - Dilemma of wanting to help patients and fear of getting infected - Physical and psychological preparation |
| Nurses' expectations of workload | Support management | - Inability to transfer trained nurse - Teamwork |
| | Comprehensive care for patient | - Does not meet the psychological needs of the patient |

"After handover, some of the nurses in the first group went to red zone. They are ready to use hazmat suits, while the others prepare medicine while the Primary Nurse called doctor for reporting and all kinds of things. The medicine is usually prepared in a special medicine room. The first group who is using hazmat or personal protective equipment (PPE), controls all patients before the medicine comes" (P7)

Workload increase factors

Workload increase factors consist of two categories namely non-nursing care factor and excessive working capacity. The increase in workload was also caused by nurses doing nursing care work in addition to work assigned by other health workers out of fear of officers (food delivery person) entering the infection area (red zone). Nurses are overworked because some of the nurses were moved to newly opened room to meet the bed needs of COVID-19 patients, resulting in a shortage of staff. Sometimes, experienced nurses are also rotated to other places so they are replaced by new nurses whom they have to teach.

Non-nursing care factor

The results of the analysis found that nurses do not only work related to their main job, namely nursing care, but are also charged with other non-nursing care jobs, such as food distribution and milk preparation. Nurses also conduct housekeeping, draw blood for laboratory examinations, write prescriptions, administer medication and perform administrative tasks. The following are statements from participants:

"...That was also negotiated but they were still afraid. They just carried a trolley and lunch box to the front of the iron door even though they were already wearing dresses. We will distribute it all later. We will also collect the lunch box trash. Make sure it is tidy first and then we will go out." (P3). "They (food delivery person) does not come in (the red zone). They just hand over to the nurse that the food for the patient has arrived, so we transfer it from the outside room into the red zone" (P5). "Sometimes, nurses also do administrative work, for example, entering doctor's visit data into the computer, because not all rooms have administrative staff, I do not think it is our priority work, it is not in a nurse's job description." (P1). "When the patient is discharged, the medicine has been put in the pharmacy depot. Usually, when the patient goes home, it is conveyed first at the pharmacy depot how many times the patient must take the medicine, etc. The patient's family is educated, but sometimes the medicine has been given to us, we also explain..." (P1)

Over working capacity

A new COVID-19 isolation ward addition caused some of nurses to be transferred to the new room. This caused a shortage of nurses in the isolation ward. The shortage of personnel was a big obstacle during the pandemic. Hospitals and new rooms were ready to use staff urgently, especially at the peak of the pandemic. The senior nurses have to teach a new staff, so that a burden on senior nurses in the ward. The following are statements from the participants:

"In the past, the COVID was only a few rooms. Now there are more and more rooms, the nurses are increasingly divided into new wards. In the past, COVID patients were only a few rooms. Now the rooms are getting more and more nurses. The more they are divided up, is not a team. If there are four nurses in the afternoon, we are eight nurses. One team consists of four nurses. Right now, when we are going in the red

zone, we are taking care of 12 patients with one nurse. If we take care of him inside, we serve all of patient need, from diapers, urinating, scratching..." (P7). "Yes, fine, in my conscience is actually sincere, because it's a pandemic situation. What I have felt from March until now, I feel. I'm tired too, well, teaching people also requires patience and takes a lot of time." (P8)

Challenges

The challenges of caring COVID-19 patients include physical fatigue and psychological stress. Workload challenges arise from work environment factors such as the use of personal protective equipment. There is also a sense of psychological exhaustion because of the dilemma between the desire to help and the fear of being infected; thus, it is necessary to increase both physical and psychological alertness.

Physical fatigue

Nurses who treat COVID-19 patients feel tired due to the use of PPE over a long period of time and with an increasing number of patients. The participants said:

"I am so tired, because that one night we really only tried to sleep for a while and only eat for an hour at most, because we constantly had to wear hazmat" (P8). "The challenge of working in the COVID room is that you have to wear PPE making it difficult to do work such as feeding, bathing, changing diapers and other work" (P7). "The 8 month period has started a lot... tired these 8 months are hard times, the number of patients is getting higher" (P5)

Psychological stress

The results of the analysis found that nurses also experienced psychological stress. Nurses feel a dilemma because they want to provide the best service, yet they are afraid of being infected with COVID-19. Another participant stated that the challenge is to prepare physically and psychologically. The following is the participant's statement:

"The problem is ... I want to come in to help but how can I? I have to use PPE first, I'm also wary. Be careful, I'm still scared too..."(P6). "Physical and psychological challenges because it is different from the times before the pandemic, this pandemic is more difficult. Because the number of COVID cases is increasing day by day. Suddenly there are patients who are confirmed suddenly and come without us knowing. We have to improve physically and psychologically" (P4)

Nurse' expectations

The Nurses' expectation is support from managers and moreover nurses can provide more

comprehensive care to their patient. Manager support is very much needed in especially the pandemic situation.

Management support

The results of the analysis reveal the desire of leaders not to rotate nurses who have been trained in leadership and support for other nurses. The nurses' hope for manager to not rotate nurses who have been trained and to not require them to perform non-nursing care jobs. The participants said the following:

"If you are already in the ICU, you are existing in the ICU. If manager really wants to add more personnel, do not send anyone out from this room. New nurses who were placed in ICU to be confused. But now, our team in the ICU was quite good" (P9). "Yes, they were supposed to be working according to their profession" (P8)

Comprehensive care

Nurses hope to be able to provide psychological support, but find this difficult due to the large ratio of nurses to patients. One of the nurses stated: "How do we meet the psychological needs of the patient? Because sometimes we think about the patient's biology and so on, the patient's psychology may not be considered, in my opinion, because the number of patients, maybe one person, is right compared to seven. It's like wow... it's a bit difficult, isn't it?" (P2).

Discussion

The workload of nurses involves all the time and care exerted to carry out direct and indirect care activities for patients, workplaces, and professional development [14]. Nurses who work in COVID-19 rooms have different activities from those working in other rooms; this requires new strategies to regulate their activities. Activities in the COVID-19 isolation room are fully carried out by nurses because this approach minimizes the spread of COVID-19 to other people. Nurses perform activities based on shift times, which are divided into three shifts following a morning-afternoon-night scheme with an 8–8–10 h schedule. Nurses in each shift alternate entering the isolation room (red zone) for 3–4 h. The morning shift is divided into two groups and the night shift into three groups. The results of the study also find that the nurses had to work together in the red zone and green zone area. This practice differs from studies in several countries that apply longer shifts of 8–12 h to overcome the shortage of nurses, longer shifts cause dehydration, and discomfort [15] Working longer shifts puts nurses at higher risk of mental and

physical exhaustion, increased stress and decreased performance and quality of care [16].

In this study, one of the factors that increased the workload of nurses was the non-nursing care factor. There were three categories that were mainly focused on the adoption of non-nursing care by nurses and on increasing work capacity. These findings are in line with other research which found that the factors that influence the increase in the workload of nurses are due to non-nursing care factors, including work from the organization, coordination with other staff, lack of self-control due to increased work capacity, and work environment factors [17]. Other supporting research papers state that the biggest factor in increasing the workload of nurses and causing burnout is household activities [18]. Other studies from the literature review also find that non-direct patient care factors affect nursing workload. This study classifies the causative factors as follows: hospital and ward characteristics, nursing team characteristic, characteristics of individual nurse, and patient and family characteristics [19].

A synthesis of literature reviews shows that the studies obtain results from various research methods, such as time-motion, work sampling, and self-reporting versus external observation. It was found that nurses spent half their time providing direct care and documentation. Nurses also carry out several non-care activities that should be delegated to nurse assistants or other staff, such as patient transportation, resulting in some nurse activities such as fostering relationships, patient therapy education, and patient assessments being neglected [20].

In this study, it was learned from the interviews of the nurses that health workers experience fear and anxiety when providing services to patients. Some professions or health workers other than nurses were found to be reluctant to enter the red zone and entrust their tasks to nurses, such as distributing food, cleaning, explaining medicine, and administrative tasks. This is in line with Muller's and other studies showing that many healthcare providers deal with depression, anxiety, insomnia, and mental distress. Female nurses are more likely to have mental health problems than other health workers [21], [22]. It should be noted that other hospitals may have different policies in room management that promote teamwork and a proper delegation of tasks among their health workers. The results of other studies found that professionals (doctors, nurses, physiotherapists, and pharmacologists) can use their knowledge and resources to cope with delirium despite the heavy workload and clinical challenges posed by the pandemic [23].

The increase in work capacity is due to all the patient needs being met by nurses, given that COVID-19 patients cannot be visited by their families. Nurses working in the COVID room experience a new, challenging work scenario. Nurses are required to exert a greater effort to care for patients because

patients cannot receive outside visitors, thus patients depend on the support of health workers [12]. The increase in capacity is also due to a shortage of nurses; this causes the nurse-patient ratio to increase. In this study, it was found that during the pandemic, the nurse-patient ratio increased to 1:12 patients in the COVID-isolation room. In line with this study, it is known that there is a significant relationship between nurse-bed ratio and nurses' perceptions of their ability to cope with the workload in the ward [24].

Data analysis shows that nurses find many challenges in working in the COVID-19 isolation room, such as fatigue and psychological stress. Nurses were found to be tired due to the use of PPE. In line with other research, it was found that the burden faced by nurses working in COVID rooms was higher than those working in non-COVID rooms, thereby increasing physical and mental stress on nurses [25]. Another study found that the capacity to provide care in the ICU reached three patients, causing the nurses to feel fatigued. The complexity of the care provided was compounded by the limited number of staff, leading to an increased workload and physical fatigue [26]. Extreme fatigue is also caused by prolonged use of personal protective equipment [27]. According to research, there was significantly higher fatigue score for providers wearing PPE compared with the baseline specifically among prehospital providers [28]. This is in line with qualitative research that found that self-management of health workers treating COVID-19 increasing self-awareness by strengthening the immune system, maintaining a proper diet, and psychologically dealing with stress [29].

The expectations of nurses have not been treated comprehensively. A qualitative study stated that nurses experienced panic anxiety in rapidly changing situations, care erosion, feelings of helplessness after seeing patients suffering, and the dilemma between providing comprehensive care and fearful of being infected with COVID19 [26]. This also affected nurses, so nurses kept their distance from their patients. Other studies suggest that health institutions provide opportunities for nurses to support one another and discuss the stress they experience [30].

Conclusion

Nurses' workloads have increased in caring for COVID-19 patients. This is due to many factors. In this study, it was found that nurses' perceptions of their workload consisted of four themes, namely: the division of work, factors that increase workload, challenges, and expectations of nurses caring for COVID-19 patients in isolation rooms. The division of labor through the division of shifts, alternate into the red zone, and cooperation between health workers who work inside

and outside the room all form part of a nurse's division of work. Factors that increase the workload of nurses are the addition of non-nursing care jobs from other health workers and the teaching of new nurses. The challenge of increasing the workload can cause fatigue for health workers, especially nurses, which in turn decreases the quality of patient care. Nurses must also always remain vigilant using PPE, even though other challenges increase nurses' fatigue. The hope of nurses is that health institutions provide support so that nurses who have been trained are not rotated to other places, especially in the healthcare profession where teamwork is necessary to provide the proper care for COVID-19 patients. Nurses also hope to provide comprehensive nursing care including biological, psychological, social, and spiritual care.

The COVID-19 era creates new problems in the workload of nurses; thus, it is necessary to consider the creation of institutions that provide support to nurses. Nurses need resource support and psychological support. Institutions also need to prepare skilled personnel before placing them in the COVID-19 room, and it is recommended that they do not rotate to experienced nursing staff. Finally, support from other teams of health workers is necessary to be able to work together as a solid team.

Limitations

Among the limitations of this research is the fact it could not have been conducted face-to-face due to restrictions on outside visitors. Interviews were conducted through video call media; this could lead to a less optimal understanding of the phenomena and conditions of the isolation room.

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References

- World Health Organization. WHO Coronavirus 2019 (COVID-19). Geneva: WHO; 2021. Available from: <https://www.covid19.who.int> [Last accessed on 2021 Nov 23].
- Ministry of Health Indonesia. Situasi Terkini Perkembangan Coronavirus Disease (COVID-19). Indonesia: Ministry of Health Indonesia; 2020. Available from: <https://www.infeksiemerging.kemkes.go.id/situasi-infeksi-emerging/situasi-terkini-perkembangan-coronavirus-disease-covid-19-16-november-2021> [Last accessed on 2021 Nov 23].
- Koh Y, Hegney D, Drury V. Nurses' perceptions of risk from emerging respiratory infectious diseases: A Singapore study. *Int J Nurs Pract*. 2012;18(2):195-204. <https://doi.org/10.1111/j.1440-172X.2012.02018.x> PMID:22435984
- International Council of Nurses. ICN Calls for Data on Healthcare Worker Infection Rates and Deaths. Geneva, Switzerland: International Council of Nurses; 2020. Available from: <https://www.icn.ch/news/icn-calls-data-healthcare-worker-infection-rates-and-deaths> [Last accessed on 2020 Oct 18].
- Ministry of Health Indonesia. Jumlah Kematian Tenaga Kesehatan Indonesia per Bulan, Laporan COVID-19. Indonesia; Ministry of Health Indonesia; 2020. Available from: <https://www.nakes.laporcovid19.org/statistik> [Last accessed on 2021 Jan 30].
- Bruyneel A. Impact of COVID-19 on nursing time in intensive care units in Belgium. *Intensive Crit Care Nurs*. 2021;62:102967. <https://doi.org/10.1016/j.iccn.2020.102967> PMID:33162312
- Hoogendoorn ME, Brinkman S, Bosman RJ, Haringman J, de Keizer NF, Spijkstra JJ. The impact of COVID-19 on nursing workload and planning of nursing staff on the intensive care: A prospective descriptive multicenter study. *Int J Nurs Stud*. 2021;121:104005. <https://doi.org/10.1016/j.ijnurstu.2021.104005>
- Lucchini A, Iozzo P, Bambi S. Nursing workload in the COVID-19 era. *Intensive Crit Care Nurs*. 2020;61:102929. <https://doi.org/10.1016/j.iccn.2020.102929> PMID:32893048
- Reper P, Bombart M, Leonard L, Darquennes O, Labrique S. COVID-19 effects on the workload of Iranian healthcare workers. *Intensive Crit Care Nurs*. 2020;60:102891.
- MacPhee M, Dahinten V, Havaei F. The impact of heavy perceived nurse workloads on patient and nurse outcomes. *Adm Sci*. 2017;7(1):7. <https://doi.org/10.3390/admsci7010007>
- Holden RJ, Scanlon MC, Patel NR, Kaushal R, Escoto KH, Brown RL, *et al*. A human factors framework and study of the effect of nursing workload on patient safety and employee quality of working life. *BMJ Qual Saf*. 2011;20(1):15-24. <https://doi.org/10.1136/bmjqs.2008.028381> PMID:100000221
- Fernandez R, Lord H, Halcomb E, Moxham L, Middleton R, Alananzeh I, *et al*. Implications for COVID-19: A systematic review of nurses' experiences of working in acute care hospital settings during a respiratory pandemic. *Int J Nurs Stud*. 2020;111:103637. <https://doi.org/10.1016/j.ijnurstu.2020.103637> PMID:32919358
- Glasser BG. The Constant Comparative Method of Qualitative Analysis. Oxford, United Kingdom: Oxford University Press; 1965. Available from: <https://www.jstor.org/stable/798843> [Last accessed on 2021 Nov 23].
- Alghamdi MG. Nursing workload: A concept analysis. *J Nurs Manag*. 2016;24(4):449-57. <https://doi.org/10.0.4.87/jonm.12354>
- Gao X, Jiang L, Hu Y, Li L, Hou L. Nurses' experiences regarding shift patterns in isolation wards during the COVID-19 pandemic in China: A qualitative study. *J Clin Nurs*. 2020;29(21-22):4270-80. <https://doi.org/10.1111/jocn.15464> PMID:32810919
- Griffiths P, Dall'Ora C, Simon M, Ball J, Lindqvist R, Rafferty AM, *et al*. Nurses' shift length and overtime working in 12 European countries: The association with perceived quality of care and patient safety. *Med Care*. 2014;52(11):975-81. <https://doi.org/10.1097/MLR.000000000000233> PMID:25226543

17. Fagerström L, Vainikainen P. Nurses' experiences of nonpatient factors that affect nursing workload: A study of the PAONCIL instrument's nonpatient factors. *Nurs Res Pract*. 2014;2014:167674. <https://doi.org/10.1155/2014/167674>
PMid:25050179
18. Morgantini LA, Naha U, Wang H, Francavilla S, Acar Ö, Flores JM, et al. Factors contributing to healthcare professional burnout during the COVID-19 pandemic: A rapid turnaround global survey. *PLoS One*. 2020;15(9):e0238217. <https://doi.org/10.1371/journal.pone.0238217>
PMid:32881887
19. Myny D, van Hecke A, de Bacquer D, Verhaeghe S, Gobert M, Defloor T, et al. Determining a set of measurable and relevant factors affecting nursing workload in the acute care hospital setting: A cross-sectional study. *Int J Nurs Stud*. 2012;49(4):427-36. <https://doi.org/10.1016/j.ijnurstu.2011.10.005>
PMid:22030021
20. Myny D, van Goubergen D, Gobert M, Vanderwee K, van Hecke A, Defloor T. Non-direct patient care factors influencing nursing workload: A review of the literature. *J Adv Nurs*. 2011;67(10):2109-29. <https://doi.org/10.1111/j.1365-2648.2011.05689.x>
PMid:21722164
21. Muller AE, Hafstad EV, Himmels JP, Smedslund G, Flottorp S, Stensland SØ, et al. The mental health impact of the COVID-19 pandemic on healthcare workers, and interventions to help them: A rapid systematic review. *Psychiatry Res*. 2020;293:113441. <https://doi.org/10.1016/j.psychres.2020.113441>
PMid:32898840
22. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to Coronavirus disease 2019. *JAMA Netw Open*. 2020;3(3):e203976. <https://doi.org/10.1001/jamanetworkopen.2020.3976>
PMid:32202646
23. Andrews LJ, Benken ST. COVID-19: ICU delirium management during SARS-CoV-2 pandemic-pharmacological considerations. *Crit Care*. 2020;24(1):375. <https://doi.org/10.1186/s13054-020-03072-5>
PMid:32576234
24. Adams A, Bond S. Staffing in acute hospital wards: Part 1. The relationship between number of nurses and ward organizational environment. *J Nurs Manag*. 2003;11(5):287-92. <https://doi.org/10.1046/j.1365-2834.2003.00361.x>
PMid:12930533
25. Shoja E, Aghamohammadi V, Bazayr H, Moghaddam HR, Nasiri K, Dashti M, et al. "COVID-19 effects on the workload of Iranian healthcare workers BMC Public Health. 2020;20(1):1636. <https://doi.org/10.1186/s12889-020-09743-w>
PMid:33138798
26. Galehdar N, Toulabi T, Kamran A, Heydari H. Exploring nurses' perception of taking care of patients with coronavirus disease (COVID-19): A qualitative study. *Nurs Open*. 2020;8(1):171-9. <https://doi.org/10.1002/nop2.616>
PMid:33318825
27. Sun N, Wei L, Shi S, Jiao D, Song R, Ma L, et al. A qualitative study on the psychological experience of caregivers of COVID-19 patients. *Am J Infect Control*. 2020;48(6):592-8. <https://doi.org/10.1016/j.ajic.2020.03.018>
PMid:32334904
28. Donoghue AJ, Kou M, Good GL, Eiger C, Nash M, Henretig FM, et al. Impact of personal protective equipment on pediatric cardiopulmonary resuscitation performance: A controlled trial. *Pediatr Emerg Care*. 2020;36(6):267-73. <https://doi.org/10.1097/PEC.0000000000002109>
PMid:32483079
29. Pranata S, Wu SV, Purwadi H, Gede D, Putra S, Wulandari H. Exploring of Self-management experience among health professional survivors from Coronavirus disease 2019 in West Nusa Tenggara, Indonesia. *Open Access Maced J Med Sci*. 2021;9:19-27. <https://doi.org/10.3889/oamjms.2021.6443>
30. Sampaio F, Sequeira C, Teixeira L. Nurses' mental health during the COVID-19 outbreak: A cross-sectional study. *J Occup Environ Med*. 2020;62(10):783-7. <https://doi.org/10.1097/JOM.0000000000001987>
PMid:32769803