Susanto, J. et al. (2025)
Jurnal Keperawatan Soedirman – Vol 20, No 2 page 139-146
http://jos.unsoed.ac.id/index.php/jks/index

ORIGINAL ARTICLE

INDONESIAN NURSING DIAGNOSIS STANDARDS FOR COVID-19 IN PATIENTS IN EAST JAVA, INDONESIA

Joko Susanto[1,2]*, Ilkafah Ilkafah[1], Anestasia Pangestu Mei Tyas[1], Makhfudli Makhfudli [2], Ah. Yusuf[2]

1. Faculty of Vocational Studies, Universitas Airlangga, Surabaya, Indonesia
2. Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

Article Information
Received: 19 December 2023
Revised: 11 August 2024
Accepted: 1 July 2025

***Corresponding Author**
Joko Susanto
jsusanto@vokasi.unair.ac.id

DOI
10.20884/1.jks.2025.20.2.10179

ABSTRACT

Establishing the correct nursing diagnosis in patients with COVID-19 is crucial for determining the most effective nursing care to help patients recover optimally. The research aims to describe and analyze nursing diagnoses in COVID-19 patients treated in isolation rooms and Intensive Care Units (ICUs). This research used secondary data analysis from 296 hospital medical records of COVID-19 patients at dr. Soegiri Lamongan Hospital from February to August 2021. The researchers employed a simple random sampling technique to collect the data and analyzed it using descriptive statistics. The research revealed that the common symptoms and nursing diagnoses among hospitalized COVID-19 patients included hyperthermia, coughing, shortness of breath, decreased consciousness, ineffective airway clearance, impaired gas exchange, self-care deficit, impaired spontaneous ventilation, spontaneous circulatory disorders, knowledge deficit, and shock risk. The results of this study provide information about variations in nursing diagnoses among COVID-19 patients. Thus, nurses can use this primary data to develop comprehensive standards of nursing care for COVID-19 patients.

Keywords: *COVID-19; nursing assessments; indonesian nursing diagnosis*

ISSN : 1907-6637 **e-ISSN : 2579-9320**

BACKGROUND

The Corona Virus Infection Disease (COVID-19) is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). SARS-CoV-2 infection can damage multiple organs in the human body, including the lungs, brain, heart, liver, and kidneys (Astuti et al., 2022). COVID-19 infection can also cause mild to severe acute respiratory infections, acute respiratory distress syndrome, sepsis, and septic shock (Roudsari et al., 2020). Common symptoms of the disease include fever, cough, runny nose, shortness of breath, headache, malaise, muscle aches, nausea, vomiting, stomachache, and diarrhea (Astuti et al., 2022; Barioni et al., 2022). Patients with mild symptoms do not require hospitalization unless there is concern that they will worsen rapidly, based on medical considerations.

Data from Wuhan, China, shows that 15% of hospitalized patients experienced severe symptoms and needed oxygen therapy, and around 5% had to be treated in the ICU. In some cases, the patients had to be put on a mechanical ventilator, with severe pneumonia being the most common diagnosis (Rasmussen et al., 2020).
In Indonesia, there were 1,414,741 cases, with a death toll of 38,329 (Indonesian National Economic Recovery Committee, 2021). Between February and August 2021, dr. Soegiri Lamongan Hospital records reported that 1,127 patients were treated in the COVID-19 isolation room.

Nurses play a critical role in managing the pandemic, as 75% of medical personnel provide nursing care 24 hours a day to all patients infected with COVID-19 (Rohimah et al., 2022). Nursing care encompasses a series of interactions between nurses, patients, and their environment, designed to meet patient needs based on nursing diagnoses, interventions, and expected outcomes (Asghari et al., 2022; Swanson et al., 2021). Nursing diagnoses play a significant role in determining appropriate nursing care to help patients recover optimally (González Aguña et al., 2022; Siokal et al., 2023). A nursing diagnosis is a clinical assessment of an individual's, family's, or community's experience or response to a health problem. This diagnosis includes the risks associated with the

diagnosed health problem or life process. A nursing diagnosis is determined through a systematic process comprising three stages: data analysis, problem identification, and diagnosis formulation (Indonesian Nursing Diagnosis Standards Working Group Team Central Management of the Indonesian National Nurses Association, 2017; Ramalho Neto et al., 2020).

Nursing diagnoses associated with patients with COVID-19 based on patient assessments and responses include anxiety related to unknown disease etiology, ineffective breathing patterns related to shortness of breath, hyperthermia related to increased metabolic rate, and infection related to failure to avoid pathogens caused by COVID-19 (Dewi et al., 2020; González-Aguña et al., 2021).

In Indonesia, nursing diagnoses are formulated per the Indonesian Nursing Diagnosis Standards. The Indonesian Nursing Diagnosis Standards serve as a benchmark and guideline for determining nursing diagnoses to provide safe, effective, and ethical nursing care (Indonesian Nursing Diagnosis Standards Working Group Team Central Management of the Indonesian National Nurses Association, 2017).

When providing nursing care, a nurse must determine the nursing diagnosis (data grouping, data analysis, data interpretation, data validation, and preparation of nursing diagnoses) so they can evaluate the patient's condition correctly on an ongoing basis (Indonesian Nursing Diagnosis Standards Working Group Team Central Management of the Indonesian National Nurses Association, 2017). Determining the nursing diagnosis is an independent function and is one of the nurse's main tasks. Nurses provide nursing care by applying knowledge, clinical reasoning, and decision-making processes. It also serves as a methodological tool that enables nurses to systematically identify, understand, evaluate, and predict patient health issues (Queiroz et al., 2020).

Nursing care plans encompass nursing diagnoses, care plans, nursing interventions, and evaluations. These tasks are important for nurses, especially during the COVID-19 pandemic (Barioni et al., 2022). However, there were no reports on nursing care planning for COVID-19 patients, especially the enforcement of nursing diagnoses based on the Indonesian Nursing Diagnosis Standards.

The Indonesian Nursing Diagnosis Standards are standards compiled by the Indonesian National Nurses Association to improve the quality of nursing care and the professionalism of nurses. These diagnostic standards are compiled based on a combination of three main references: the North American Nursing Association (NANDA), the International Classification of Nursing Practice (ICNP), and the Carpenito Nursing Care Plans (CNCP) (Indonesian Nursing Diagnosis Standards Working Group Team Central Management of the Indonesian National Nurses Association, 2017). However, in Indonesia, there has been no research on the diagnostic standards and actions that nurses must take to care for COVID-19 patients.

dr. Soegiri Lamongan Hospital is a Type B educational referral general hospital owned by the Lamongan Regency Government. During the COVID-19 pandemic, patients infected with COVID-19 were hospitalized in a designated isolation room, known as the Wuhan room, at dr. Soegiri Lamongan Hospital. The Wuhan isolation room can accommodate 50 patients, while the COVID-19 ICU can accommodate seven patients. During the pandemic, Lamongan Regency was one of the areas in East Java with a high prevalence of COVID-19. However, the nursing diagnosis for each patient with COVID-19 varied. Therefore, this study aims to analyze and formulate nursing diagnoses for COVID-19 patients treated in the Wuhan isolation room at dr. Soegiri Lamongan Regional General Hospital.

METHOD

Study design

A descriptive cross-sectional approach was employed in this study by conducting secondary data analysis from the medical records of COVID-19 patients treated at dr. Soegiri Lamongan Regional Hospital from February to August 2021, where patients were treated in isolation rooms and the ICU

Sample

The number of samples was determined using Slovin's Formula: $n = 1{,}127 / [1 + 1{,}127(0.05)^2] = 295.22$, rounded to 296 patients. The researchers used the simple random sampling technique. The inclusion criteria were patients confirmed positive for COVID-19 via PCR swab test and in an isolation room or ICU for at least three days. The exclusion criteria included patient data from those confirmed positive for COVID-19 through PCR swab tests in outpatient services and data from patients with COVID-19 treated in an isolation room or ICU for less than three days.

Instruments

The research instrument used a data recapitulation sheet to tabulate data and identify patterns in patient signs and symptoms, which were obtained from medical records. This sheet helped researchers determine nursing diagnoses based on the Indonesian Nursing Diagnosis Standards.

Data Collection

Researchers directly collected data on patients treated in isolation rooms and the COVID-19 ICU who met the inclusion criteria. Eligible patients were recorded sequentially by admission date and then randomly selected by writing their names on folded paper. After collecting the required number of patients, data on signs and symptoms were obtained from medical records. The data were then tabulated and analyzed descriptively.

Data analysis

Data were analyzed using descriptive statistics.

Ethical considerations

The research has been approved by the Health Research Ethics Committee dr. Soegiri Lamongan Hospital with the number 445/0048.43/413.209/KEPK/2023.

RESULT

The research study included a total of 296 medical records of COVID-19 patients. Among those records, 250 patients were treated in isolation rooms, while 46 were in the ICU. The study found that most COVID-19 patients (77.4%) were between the ages of 21 and 60 years. Additionally, most patients were female (71.7%). Half of the patients (47.8%) had a high school education, and most worked as entrepreneurs (26.1%) (Table 1).

Table 1. The characteristics and sociodemographic of COVID-19 patients (n = 296)

Characteristics	Isolation room		ICU		Total	
	f	%	f	%	f	%
Age						
0-10 years	4	1.6	0	0.0	4	1.3
11-20 years	18	7.2	4	8.7	22	7.4
21-60 years	195	78.0	34	73.9	229	77.4
> 60 years	33	13.2	8	17.4	41	13.9
Gender						
Male	72	28.8	13	28.3	85	28.7
Female	178	71.2	33	71.7	211	71.3
Education						
No school	0	0.0	0	0.0	0	0.0
Elementary school	11	4.4	3	6.5	14	4.7
Junior high school	33	13.2	8	17.4	41	13.9
Senior High School	130	52.0	22	47.8	152	51.4
Diploma/ College	76	30.4	13	28.3	89	30.0
Occupation						
Farmer	24	9.6	5	10.9	29	9.8
Civil Servant / Army /Police	50	20.0	9	19.6	59	19.6
Entrepreneur	69	27.6	12	26.1	81	26.1
Private Employees	44	17.6	8	17.4	52	17.4
Housewife	39	15.6	9	19.6	48	19.6
Student	24	9.6	3	6.5	27	6.5

Table 2 shows that almost all the sampled COVID-19 patients experienced pneumonia. Moreover, most patients (65.2%) had comorbidities, such as diabetes mellitus, hypertension, coronary heart disease, stroke, acute and chronic kidney failure, gastritis, cancer, hepatitis, and post-operative cesarean section. The results also show that almost all patients (97.3%) in the isolation room recovered, which is higher than the number of patients that recovered in the ICU, at 60.9%.

Table 2. The prognosis and comorbidity of COVID-19 patients (n = 296)

Characteristics	Isolation room		ICU	
	f	%	f	%
Pneumonia				
Yes	241	96.4	46	100.0
No	9	3.6	0	0.0
Comorbidity				
Yes	163	65.2	46	100.0
No	87	34.8	0	0.0
Prognosis				
Recovery	288	97.3	28	60.9
Death	8	2.7	18	39.1

Table 3. Signs and symptoms experienced by COVID-19 patients (n = 296)

Sign and symptoms	Isolation room		ICU	
	f	%	f	%
Fever, temperature >37.5^{o} C	143	57.2	27	58.7
Phlegm cough/dry cough	124	49.6	43	93.5
Shortness of breath, respiration > 20 x/minute	96	38.4	45	97.8
SpO_2 decreased <90%	91	36.4	44	95.7
Wheezing	80	32.0	22	47.8
Having no idea on the changes process of the disease	71	28.4	16	34.8
Having no idea of the treatment procedures for COVID-19	71	28.4	16	34.8
Unaware having the disease	68	27.2	18	39.1
PO_2 decreased < 83%	57	22.8	40	87.0
SaO_2 decreased 85% - 90%	55	22.0	34	73.9
Excessive sputum	46	18.4	20	43.5
Dry rhonchi	37	14.8	9	19.6
Abnormal blood Ph	37	14.8	31	67.4
PCO_2 increased	21	8.4	18	39.1
Impaired ability to bathe	19	7.6	40	87.0
Impaired ability to go to the toilet	19	7.6	40	87.0
Impaired ability to change clothes	10	4.0	40	87.0

Sign and symptoms	Isolation room		ICU	
	f	%	f	%
Impaired ability to self-feed a complete meal	10	4.0	17	37.0
Impaired ability to groom	10	4.0	17	37.0
Heartburn	8	3.2	1	2.2
Decrease in level of consciousness/unconscious	6	2.4	24	52.2
Diarrhea	6	2.4	1	2.2
SaO_2 <85%	6	2.4	24	52.2
Pulse frequency <50 x/minute	6	2.4	24	52.2
Breath frequency < 6 x/minute	6	2.4	24	52.2
Systolic pressure < 60 mmHg	6	2.4	24	52.2
Nausea, vomiting	4	1.6	1	2.2
Pain in surgical site	4	1.6	1	2.2
Pulse frequency >150 x/minute	4	1.6	1	2.2
Anosmia	1	0.4	1	2.2

Table 3 shows that the signs and symptoms most experienced by COVID-19 patients in isolation rooms are fever with a temperature of over 37.5°C (57.2%). In contrast, the signs and symptoms most experienced by patients in the ICU were shortness of breath (93.5%).

Table 4. Distribution and description of nursing diagnoses of COVID-19 patients (n = 296)

Nursing diagnoses	f	%
Nursing diagnoses in the isolation rooms		
Hyperthermia	143	57.2
Ineffective airway clearance	111	44.4
Impaired gas exchange	71	28.4
Knowledge deficit	37	14.8
Impaired spontaneous ventilation	21	8.4
Self-care deficit	17	6.8
Acute pain	12	4.8
Shock risk	4	1.6
Diarrhea	4	1.6
Spontaneous circulatory disorders	3	1.2
Nausea	3	1.2
Risk of ineffective cerebral perfusion	1	0.4
Risk for nutritional deficiency	1	0.4
Nursing diagnoses in the ICUs		
Impaired gas exchange	44	95.7
Self-care deficit	41	89.1
Ineffective airway clearance	36	78.3
Impaired spontaneous ventilation	27	58.7
Hyperthermia	24	52.2
Spontaneous circulatory disorders	24	52.2
Shock risk	24	52.2

Table 4 shows that the most common nursing diagnosis in COVID-19 patients treated in isolation rooms is hyperthermia (57.2%), ineffective airway clearance (44.4%), and gas exchange disorders (28.4%). Meanwhile, the nursing diagnoses that often appear in COVID-19 patients admitted to the ICU are gas exchange disorders (95.7%), followed by a self-care deficit (89.1%), ineffective airway clearance (78.3%), and spontaneous circulatory disorders (58.7%).

DISCUSSION

Signs and Symptoms in COVID-19 Patients Treated in the Isolation Room and ICU

A temperature greater than 37.5°C or a fever is the most common sign and symptom in COVID-19 patients treated in isolation rooms. Patients experience a high temperature as their body's metabolic rate increases in response to viral infections. Fever symptoms are more dominant in the isolation rooms than in the ICU because patients in the isolation rooms are still in the early stages of disease infection. COVID-19 patients will experience fever symptoms for three to seven days (Huang et al., 2020). Fever is the most dominant symptom in approximately 44.7% of COVID-19 among hospitalized patients, and its prevalence increases to 89.8% during hospitalization (Astuti et al., 2022).

Complaints of cough and shortness of breath are more common in the ICU than in isolation rooms because more intensive treatments are given in the ICU for patients who experience more severe symptoms. Cough and shortness of breath caused by the virus will quickly invade and spread through the respiratory tract mucosa, triggering the immune response process and inducing the release of cytokines. This process changes the proportion of peripheral blood leukocytes and lymphocytes (Ye et al., 2020).

The virus also stimulates plasma cells to produce Immunoglobulin E (IgE), which binds to mast cell wall receptors, causing sensitized mast cells (Ando & Kitaura, 2021). Sensitized mast cells would then degranulate, releasing various mediators, including cytokines and histamine. Mediators cause increased capillary permeability, resulting in mucosal edema and increased mucus production (Khan et al., 2021). Several previous studies have also shown that cough is a common problem that often occurs after a fever (Fu et al., 2020).

The decrease in oxygen saturation (SpO2) is also experienced by almost all COVID-19 patients in isolation rooms and the ICU (90.9%) (Mejía et al., 2020). When patients experience a decrease in oxygen saturation to 87%, it is due to alveolar damage that has progressed, causing them to develop ARDS conditions (Ye et al., 2020). Infections can also cause local interstitial edema, especially at the interstitial surfaces of the lungs, which vary in elasticity depending on the level of stress and the location of the strain concentration. Increased pulmonary edema, loss of surfactant, and excessive pressure lead to alveolar collapse causing the heart to release some of the fluid output from the lungs, which may result in pulmonary shunts (Ravindra et al., 2021).

However, infection causes modest local interstitial edema, mainly localized at the interface between lung structures of different elasticity, where stress and strain are concentrated. As a result of increased pulmonary edema, loss of surfactants, and pressure overload, the alveoli collapse, and a portion of the cardiac output releases fluid from the un-aerated lung tissue, resulting in pulmonary shunts (Reddy et al., 2022).

The blood gas analysis examination revealed that COVID-19 patients in the ICU and isolation rooms exhibited a decrease

in PO2, a decrease in SaO2, an increase in PCO2, and abnormalities in blood pH. ICU patients had a higher risk of experiencing imbalances in blood gas components because they had already developed acute respiratory distress syndrome (ARDS). Some studies have also found signs and symptoms of decreased consciousness in patients treated in isolation rooms and ICUs. COVID-19 patients with ARDS experience hyperactivation of CD4 and CD8 lymphocytes (Motta Junior et al., 2020), leading to a cytokine storm that causes lung damage and tissue fibrosis, ultimately resulting in organ failure (Ye et al., 2020).

Moreover, this study found that only a small proportion of patients in the isolation room and the ICU exhibited anosmia. Previous studies have reported that COVID-19 patients can experience anosmia due to changes in olfactory conduction resulting from inflammatory processes that damage nasal epithelial cells and the nasal mucosa (Ogawa et al., 2022). Additionally, a small proportion of patients in the isolation rooms experienced diarrhea. Infections can also occur in the digestive system because more viruses in the intestines can survive longer than in the respiratory tract, causing gastrointestinal issues (Menezes et al., 2021). Another mechanism is that the systemic inflammatory response can develop into a Systemic Inflammatory Response Syndrome (SIRS) condition, as the cytokine storm can directly cause damage to the intestinal epithelium (Roudsari et al., 2020).

Nursing Diagnosis of COVID-19 Patients in the Isolation Room and the ICU

A total of thirteen nursing diagnoses were made in the isolation room and seven diagnoses in the ICU. All nursing diagnoses found in the ICU room are the same as some nursing diagnoses found in the isolation room, including hyperthermia, ineffective airway clearance, impaired gas exchange, impaired spontaneous ventilation, self-care deficit, shock risk, and spontaneous circulatory disorders. Each nursing diagnosis was determined based on considering more than 80% of the patient's major signs and symptoms. Therefore, each nursing diagnosis will be explained briefly (Indonesian Nursing Diagnosis Standards Working Group Team Central Management of the Indonesian National Nurses Association, 2017).

The most common diagnosis is hyperthermia, characterized by a fluctuating fever. Hyperthermia occurs due to an increase in the body's metabolic rate. It is the body's reaction to fight infection and a marker of inflammation. This condition is caused by the hypothalamus in the brain failing to regulate body temperature (Ghotbi et al., 2023).

The nursing diagnosis of ineffective airway clearance is determined by complaints of coughing. Coughing occurs due to airway hypersecretion, retained secretions, or because of an infectious process (Fu et al., 2020). Some patients experienced coughs with phlegm that was difficult to cough out, and others had dry coughs accompanied by shortness of breath and dry rhonchi (Reddy et al., 2022). Ineffective airway clearance is associated with airway hypersecretion and infectious processes (González-Aguña et al., 2021; Indonesian Nursing Diagnosis Standards Working Group Team Central Management of the Indonesian National Nurses Association, 2017).

Impaired gas exchange manifests as shortness of breath, fast or slow breathing patterns, rhonchi-like breath sounds, decreased patient consciousness, dizziness, and decreased oxygen saturation (Reddy et al., 2022). The diagnosis of impaired gas exchange is related to changes in the alveolar-capillary membrane(Ramalho Neto et al., 2020) .

Moreover, we found that a small number of patients with COVID-19 experienced a knowledge deficit due to limited information they received about COVID-19 (Deng & Peng, 2020; Hariati et al., 2023). The study reveals that most patients were unaware of the transmission process and stages of the viral infection (Astuti et al., 2022). They also lacked knowledge of disease management aspects. Some patients refused treatment in isolation rooms (Ramalho Neto et al., 2020). Knowledge deficit is associated with a lack of access to information sources or exposure to new information (Menezes et al., 2021).

Next, impaired spontaneous ventilation is characterized by the presence of dyspnea, increased PCO2 levels, decreased PO2, decreased SaO2, and increased use of accessory expiratory muscles (Barioni et al., 2022). The patient would feel anxious and exhibit signs of tachycardia. The body will perceive the virus infecting the respiratory tract as an antigen. The binding between the antigen and antibody stimulates the release of chemical mediators, including histamine, neutrophil chemotaxis, epinephrine, norepinephrine, and prostaglandins (Ogawa et al., 2022). Increased chemical mediators will stimulate increased capillary permeability and swelling of the airway mucosa (González Aguña et al., 2022). Swelling of the airway mucosa will constrict the bronchi, leading to shortness of breath (Ahmad, 2020). This constricting effect decreases the amount of incoming external oxygen during inspiration and reduces blood oxygen levels (Ramalho Neto et al., 2020). If this condition persists, it will result in a decrease in tissue oxygen, causing the patient to become pale and weak (Menezes et al., 2021). The diagnosis of impaired spontaneous ventilation is associated with respiratory muscle fatigue (Indonesian Nursing Diagnosis Standards Working Group Team, Central Management of the Indonesian National Nurses Association, 2017).

Furthermore, this study identified patients with self-care deficit diagnosis, shown by how some patients were unable to use the toilet by themselves, were unable to dress, and were unable to eat by themselves (Ramalho Neto et al., 2020). Overall weakness caused by impaired gas exchange results in patients being unable to care for themselves (Reddy et al., 2022). Previous studies have also shown that patients with COVID-19 who have a diagnosis of self-care deficit are often related to frailty (Nascimento et al., 2021).

Next, the nursing diagnosis of shock risk was found in a small percentage of the sample. This diagnosis is characterized by the patient's low consciousness to unconsciousness, decreased systolic blood pressure (<60 mmHg), weak pulse (<50 times per minute), decreased respiratory rate, and SaO2 (<85%). Shock risk can occur when there is insufficient blood flow to tissues throughout the body, which is a life-threatening condition that can lead to cellular dysfunction (Ramalho Neto et al., 2020). Shock risk is often associated with hypoxemia and sepsis (Ramalho Neto et al., 2020). The shock risk nursing diagnosis can also be found in COVID-19 patients with Acute Respiratory Distress Syndrome (Khan et al., 2021).

Another nursing diagnosis for COVID-19 patients is spontaneous circulation disorders. This condition is similar to that experienced by patients treated in intensive care with respiratory failure due to other diseases (Motta Junior et al., 2020). When the coronavirus enters and infects the receptor, the virus forms and develops in the upper respiratory tract

and lung tissue (Fink et al., 2021). COVID-19 infection causes systemic endothelial dysfunction, resulting in impaired hemostasis, increased adhesion activity, and platelet aggregation, which can lead to death due to blood clots (Jafarzadeh et al., 2020). In addition, spontaneous circulatory disorders are partly caused by a cytokine syndrome closely associated with decreased lymphocyte levels, which trigger a significant decrease in CD8+ T cells and contribute to positive mortality and morbidity rates in COVID-19 patients (Barioni et al., 2022). This decrease in circulation significantly affects the supply of nutrients for tissue metabolism, resulting in reduced blood circulation distribution, which can lead to organ damage (Jafarzadeh et al., 2020).

Other disease diagnoses that were noted but not observed in the ICU room, such as acute pain, diarrhea, nausea, risk for ineffective cerebral perfusion, and risk for nutritional deficiency, will be explained in the following summary.

The diagnosis of acute pain in several COVID-19 patients in the isolation room occurred in patients who had comorbidities, including cesarean delivery, colon cancer, and gastritis. This diagnosis was found in 4.8% of the sampled patients in the isolation room. On average, patients complained of heartburn, lower left abdominal pain, general abdominal pain, and pain at the surgical site. Pain complaints are commonly reported in COVID-19 patients with comorbidities, but are rarely observed in COVID-19 patients who do not have comorbidities (Reddy et al., 2022).

Diarrhea and nausea were found in COVID-19 patients with gastroenteritis. The patient showed symptoms of defecation and nausea. Such a nursing diagnosis is typically associated with gastrointestinal inflammation and infectious processes (Reddy et al., 2022). A diagnosis of risk for nutritional deficiency was found in a COVID-19 patient with gastritis and gastroenteritis. The patient exhibited the following symptoms: defecation, nausea, vomiting, weakness, and weight loss to the point of a decrease in serum albumin levels (D'Amico et al., 2020).

The next diagnosis is the risk of ineffective cerebral perfusion found in COVID-19 patients with concurrent ischemic stroke. The patient showed weakness in some of their limbs, their walking slightly shuffled and they spoke sluggishly. Their CT scan examination showed a picture of ischemia. SARS-Cov-2 causes a cytokine storm that causes hypercoagulation and increased vascular thrombosis, resulting in stroke conditions, including acute ischemic stroke (Khan et al., 2021). Thus, the nursing diagnosis risk of ineffective cerebral perfusion is related to intravascular coagulation (Reddy et al., 2022).

The diagnosis risk of ineffective cerebral perfusion in COVID-19 patients is a small percentage, at 0.4%. The risk of ineffective cerebral perfusion was indicated by symptoms such as decreased consciousness, diastolic pressure, syncope, agitation, restlessness, hyperventilation, fever, and cognitive impairment (Indonesian Nursing Diagnosis Standards Working Group Team, Central Management of the Indonesian National Nurses Association, 2017). The lack of oxygen disrupts the body's oxygen supply (Mejía et al., 2020). Impaired oxygen regulation leads to hypoxic conditions, characterized by values below 40 mmHg, which manifest as dyspnea and hyperventilation (Reddy et al., 2022). The body compensates for hypoxia by increasing ventilation within one minute, followed by an increasing respiratory rate and tidal volume (Michard et al., 2020). The hyperventilated condition further causes arterial vasoconstriction, which inhibits blood supply to the cerebral cortex, leading to decreased consciousness, cognitive impairment, and changes in all forms of response (Rahman et al., 2021). COVID-19 patients show poor outcomes with comorbid disorders of cerebrovascular hemodynamics due to hypoxia (Michard et al., 2020). Hypoxic conditions also indirectly cause organ damage, especially to the brain, due to a lack of oxygen (Rahman et al., 2021).

A nursing diagnosis of risk for nutritional deficiency can be made if the patient is at risk of experiencing insufficient nutritional intake to meet their metabolic needs (D'Amico et al., 2020). This diagnosis is related to the patient's inability to absorb nutrients and increased metabolic needs (Richardson & Lovegrove, 2021).

This study's limitation is that some of the assessment data are not fully documented in the medical records, which affects the interpretation and formulation of nursing diagnoses. Incomplete medical record documentation will result in incomplete data collection and analysis. Thus, the nursing diagnosis formulated may not accurately describe the patient's actual condition. This lack of information will impact patient safety. It may lead to negligence, as nurses will have difficulty proving the actions taken if a problem arises with the patient in the future.

CONCLUSION AND RECOMMENDATION

The signs and symptoms most found in COVID-19 patients treated in isolation rooms are fever and cough, while the signs and symptoms most found in patients treated in the ICU are shortness of breath. The nursing diagnoses formulated for COVID-19 patients in isolation rooms are hyperthermia, ineffective airway clearance, impaired gas exchange, knowledge deficit, impaired spontaneous ventilation, self-care deficit, acute pain, shock risk, diarrhea, spontaneous circulatory disorders, nausea, risk of ineffective cerebral perfusion and risk for nutritional deficiency. The nursing diagnoses for COVID-19 patients admitted to the ICU are impaired gas exchange, self-care deficit, ineffective airway clearance, impaired spontaneous ventilation, hyperthermia, spontaneous circulatory disorders, and shock risk.

Nurses play a crucial role in the screening process, initial assessments at the emergency unit, and reassessments in the inpatient ward. The study's results provide information on nursing diagnoses that often appear in COVID-19 cases and utilize basic data for compiling nursing care standards, particularly regarding COVID-19. Finally, these results are offered as a guide for determining nursing diagnoses, compiling individual care plans, making clinical decisions, and as a reference for similar studies.

ACKNOWLEDGEMENTS

The authors would like to thank their fellow authors for their contributions and cooperation in preparing this study. The authors would also like to express their deepest gratitude to Universitas Airlangga Surabaya, for funding this research through the Airlangga Research Fund 2023 of the *Penelitian Dosen Pemula* scheme, number 1923/UN3.1.14/PT/2023.

REFERENCES

Ahmad, S. (2020). A review of COVID-19 (Coronavirus disease-2019) diagnosis, treatments and prevention. *Eurasian Journal of Medicine and Oncology*. https://doi.org/10.14744/ejmo.2020.90853

Ando, T., & Kitaura, J. (2021). Tuning IgE: IgE-associating molecules and their effects on IgE-dependent mast cell reactions. *Cells*, *10*(7), 1697. https://doi.org/10.3390/

cells10071697

Asghari, E., Archibald, M., & Roshangar, F. (2022). Nursing interventions for patients with COVID-19: A medical record review and nursing interventions classification study. *International Journal of Nursing Knowledge*, *33*(1), 57–63. https://doi.org/10.1111/2047-3095.12332

Astuti, D. D., Handayani, T. W., Astuti, D. P., & Mandawati, M. (2022). Factors that influence the prevention behavior of the COVID-19 transmission in school-age children. *Jurnal Keperawatan Soedirman*, *17*(1), 22. https://doi.org/10.20884/1.jks.2022.17.1.5458

Barioni, E. M. S., Nascimento, C. da S. do, Amaral, T. L. M., Ramalho Neto, J. M., & Prado, P. R. do. (2022). Clinical indicators, nursing diagnoses, and mortality risk in critically ill patients with COVID-19: A retrospective cohort. *Revista Da Escola de Enfermagem Da USP*, *56*. https://doi.org/10.1590/1980-220x-reeusp-2021-0568en

D'Amico, F., Baumgart, D. C., Danese, S., & Peyrin-Biroulet, L. (2020). Diarrhea during COVID-19 infection: pathogenesis, epidemiology, prevention, and management. *Clinical Gastroenterology and Hepatology*, *18*(8), 1663–1672. https://doi.org/10.1016/j.cgh.2020.04.001

Deng, S.-Q., & Peng, H.-J. (2020). Characteristics of and public health responses to the Coronavirus disease 2019 outbreak in China. *Journal of Clinical Medicine*, *9*(2), 575. https://doi.org/10.3390/jcm9020575

Dewi, A., Utomo, B., & Rachman, S. (2020). *Nursing care guide for critical patients with COVID-19*. Airlangga University Press.

Fink, D. L., Goldman, N. R., Cai, J., El-Shakankery, K. H., Sismey, G. E., Gupta-Wright, A., & Tai, C. X. (2021). Ratio of oxygen saturation index to guide management of COVID-19 pneumonia. *Annals of the American Thoracic Society*, *18*(8), 1426–1428. https://doi.org/10.1513/AnnalsATS.202008-934RL

Fu, L., Wang, B., Yuan, T., Chen, X., Ao, Y., Fitzpatrick, T., Li, P., Zhou, Y., Lin, Y., Duan, Q., Luo, G., Fan, S., Lu, Y., Feng, A., Zhan, Y., Liang, B., Cai, W., Zhang, L., Du, X., … Zou, H. (2020). Clinical characteristics of coronavirus disease 2019 (COVID-19) in China: A systematic review and meta-analysis. *Journal of Infection*, *80*(6), 656–665. https://doi.org/10.1016/j.jinf.2020.03.041

Ghotbi, Z., Estakhr, M., Hosseini, M., & Shahripour, R. B. (2023). Cerebral vasomotor reactivity in COVID-19: A narrative review. *Life*, *13*(7), 1614. https://doi.org/10.3390/life13071614

González-Aguña, A., Jiménez-Rodríguez, M. L., Fernández-Batalla, M., Herrero-Jaén, S., Monsalvo-San Macario, E., Real-Martínez, V., & Santamaría-García, J. M. (2021). Nursing diagnoses for coronavirus disease, COVID-19: Identification by taxonomic triangulation. *International Journal of Nursing Knowledge*, *32*(2), 108–116. https://doi.org/10.1111/2047-3095.12301

González Aguña, A., Fernández Batalla, M., Gonzalo de Diego, B., Jiménez Rodríguez, M. L., Martínez Muñoz, M. L., & Santamaría García, J. M. (2022). Care recommendations for the chronic risk of COVID-19: Nursing intervention for behaviour changes. *International Journal of Environmental Research and Public Health*, *19*(14), 8532. https://doi.org/10.3390/ijerph19148532

Hariati, S., Andriani, A., Nurmaulid, N., Erfina, E., & Kadar, K. S. (2023). Preparedness of elementary school parents for offline learning decisions during the COVID-19 pandemic. *Jurnal Keperawatan Soedirman*, *18*(3), 116. https://doi.org/10.20884/1.jks.2023.18.3.7332

Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., Gu, X., Cheng, Z., Yu, T., Xia, J., Wei, Y., Wu, W., Xie, X., Yin, W., Li, H., Liu, M., … Cao, B. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*, *395*(10223), 497–506. https://doi.org/10.1016/S0140-6736(20)30183-5

Indonesian National Economic Recovery Committee. (2021). *The situation of the COVID-19 in Indonesia*. BNPB RI. https://covid19.go.id/

Indonesian Nursing Diagnosis Standards Working Group Team Central Management of the Indonesian National Nurses Association. (2017). *Indonesian Nursing Diagnosis Standards* (1 (ed.)). Central Management Board Indonesian National Nurses Association.

Jafarzadeh, A., Chauhan, P., Saha, B., Jafarzadeh, S., & Nemati, M. (2020). Contribution of monocytes and macrophages to the local tissue inflammation and cytokine storm in COVID-19: Lessons from SARS and MERS, and potential therapeutic interventions. *Life Sciences*, *257*, 118102. https://doi.org/10.1016/j.lfs.2020.118102

Khan, M. A., Khan, Z. A., Charles, M., Pratap, P., Naeem, A., Siddiqui, Z., Naqvi, N., & Srivastava, S. (2021). Cytokine storm and mucus hypersecretion in COVID-19: review of mechanisms. *Journal of Inflammation Research*, *Volume 14*, 175–189. https://doi.org/10.2147/JIR.S271292

Mejía, F., Medina, C., Cornejo, E., Morello, E., Vásquez, S., Alave, J., Schwalb, A., & Málaga, G. (2020). Oxygen saturation as a predictor of mortality in hospitalized adult patients with COVID-19 in a public hospital in Lima, Peru. *PLOS ONE*, *15*(12), e0244171. https://doi.org/10.1371/journal.pone.0244171

Menezes, H. F. de, Moura, J. L., Oliveira, S. S. de, Fonseca, M. C., Sousa, P. A. F. de, & Silva, R. A. R. da. (2021). Nursing diagnoses, results, and interventions in the care for COVID-19 patients in critical condition. *Revista Da Escola de Enfermagem Da USP*, *55*. https://doi.org/10.1590/1980-220x-reeusp-2020-0499

Michard, F., Malbrain, M. L., Martin, G. S., Fumeaux, T., Lobo, S., Gonzalez, F., Pinho-Oliveira, V., & Constantin, J.-M. (2020). Haemodynamic monitoring and management in COVID-19 intensive care patients: an International survey. *Anaesthesia Critical Care & Pain Medicine*, *39*(5), 563–569. https://doi.org/10.1016/j.accpm.2020.08.001

Motta Junior, J. da S., Miggiolaro, A. F. R. dos S., Nagashima, S., de Paula, C. B. V., Baena, C. P., Scharfstein, J., & de Noronha, L. (2020). Mast cells in alveolar septa of COVID-19 patients: A pathogenic pathway that may link interstitial edema to immunothrombosis. *Frontiers in Immunology*, *11*. https://doi.org/10.3389/fimmu.2020.574862

Nascimento, T. F., Almeida, G. M. F. de, Bello, M. P., Silva, R. P. L. da, & Fontes, C. M. B. (2021). Coronavirus

infections: health care planning based on Orem's Nursing Theory. *Revista Brasileira de Enfermagem*, *74*(suppl 1). https://doi.org/10.1590/0034-7167-2020-0281

Ogawa, F., Oi, Y., Honzawa, H., Misawa, N., Takeda, T., Kikuchi, Y., Fukui, R., Tanaka, K., Kano, D., Kato, H., Abe, T., & Takeuchi, I. (2022). Severity predictors of COVID-19 in SARS-CoV-2 variant, delta and omicron period; single center study. *PLOS ONE*, *17*(10), e0273134. https://doi.org/10.1371/journal.pone.0273134

Queiroz, A. G. S., De Souza, R. Z., Sottocornola, S. F., Barbosa, S. J., Pinheiro, F. A., & Souza, L. P. de. (2020). Diagnósticos de enfermagem segundo a taxonomia da NANDA internacional para sistematização da assistência de enfermagem a COVID-19. *Journal of Health & Biological Sciences*, *8*(1), 1–6. https://doi.org/10.12662/2317-3076jhbs.v8i1.3352.p1-6.2020

Rahman, A., Tabassum, T., Araf, Y., Al Nahid, A., Ullah, M. A., & Hosen, M. J. (2021). Silent hypoxia in COVID-19: pathomechanism and possible management strategy. *Molecular Biology Reports*, *48*(4), 3863–3869. https://doi.org/10.1007/s11033-021-06358-1

Ramalho Neto, J. M., Viana, R. A. P. P., Franco, A. S., Prado, P. R. do, Gonçalves, F. A. F., & Nóbrega, M. M. L. da. (2020). Nursing diagnosis, outcomes and interventions for critically ill patients affected by COVID-19 and sepsis. *Texto & Contexto - Enfermagem*, *29*. https://doi.org/10.1590/1980-265x-tce-2020-0160

Rasmussen, S. A., Smulian, J. C., Lednicky, J. A., Wen, T. S., & Jamieson, D. J. (2020). Coronavirus disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. *American Journal of Obstetrics and Gynecology*, *222*(5), 415–426. https://doi.org/10.1016/j.ajog.2020.02.017

Ravindra, N. G., Alfajaro, M. M., Gasque, V., Huston, N. C., Wan, H., Szigeti-Buck, K., Yasumoto, Y., Greaney, A. M., Habet, V., Chow, R. D., Chen, J. S., Wei, J., Filler, R. B., Wang, B., Wang, G., Niklason, L. E., Montgomery, R. R., Eisenbarth, S. C., Chen, S., … Wilen, C. B. (2021). Single-cell longitudinal analysis of SARS-CoV-2 infection in human airway epithelium identifies target cells, alterations in gene expression, and cell state changes. *PLOS Biology*, *19*(3), e3001143. https://doi.org/10.1371/journal.pbio.3001143

Reddy, M. P., Subramaniam, A., Chua, C., Ling, R. R., Anstey, C., Ramanathan, K., Slutsky, A. S., & Shekar, K. (2022). Respiratory system mechanics, gas exchange, and outcomes in mechanically ventilated patients with COVID-19-related acute respiratory distress syndrome: a systematic review and meta-analysis. *The Lancet Respiratory Medicine*, *10*(12), 1178–1188. https://doi.org/10.1016/S2213-2600(22)00393-9

Richardson, D. P., & Lovegrove, J. A. (2021). Nutritional status of micronutrients as a possible and modifiable risk factor for COVID-19: a UK perspective. *British Journal of Nutrition*, *125*(6), 678–684. https://doi.org/10.1017/S000711452000330X

Rohimah, A., Prakoso, A. B., Kusuma, R. Y., Jamil, S., Rini, S. S., & Alim, S. (2022). Stress management in emergency nurses during the COVID-19 pandemic: Scooping article. *Jurnal Keperawatan Soedirman*, *17*(2), 69. https://doi.org/10.20884/1.jks.2022.17.2.5586

Roudsari, P. P., Alavi-Moghadam, S., Payab, M., Sayahpour, F. A., Aghayan, H. R., Goodarzi, P., Mohamadi-jahani, F., Larijani, B., & Arjmand, B. (2020). Auxiliary role of mesenchymal stem cells as regenerative medicine soldiers to attenuate inflammatory processes of severe acute respiratory infections caused by COVID-19. *Cell and Tissue Banking*, *21*(3), 405–425. https://doi.org/10.1007/s10561-020-09842-3

Siokal, B., Amiruddin, R., Abdullah, T., Thamrin, Y., Syam, Y., Palutturi, S., Amqam, H., Pamungkas, R. A., Wahyuningsih, W., Samsualam, S., Sudarman, S., Asfar, A., & Mappanganro, A. (2023). Improving the quality of assessment and diagnosis in nursing care: a literature review. *Pharmacognosy Journal*, *15*(4), 703–706. https://doi.org/10.5530/pj.2023.15.140

Swanson, E., Mantovani, V. M., Wagner, C., Moorhead, S., Lopez, K. D., Macieira, T. G. R., & Abe, N. (2021). NANDA-I, NOC, and NIC linkages to SARS-CoV-2 (COVID-19): Part 2. Individual response. *International Journal of Nursing Knowledge*, *32*(1), 68–83. https://doi.org/10.1111/2047-3095.12307

Ye, Q., Wang, B., & Mao, J. (2020). The pathogenesis and treatment of the `Cytokine Storm' in COVID-19. *Journal of Infection*, *80*(6), 607–613. https://doi.org/10.1016/j.jinf.2020.03.037