





RESEARCH ARTICLE

Comparison of perceived general health status between suspected and confirmed cases of COVID-19 and identifying the nursing diagnoses: A cross-sectional study

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Abstract

Aim: This study aimed to examine the differences in health status between patients with confirmed COVID-19 and those suspected (other diagnosis) and to identify nursing diagnoses using a structured checklist from a hospital in China.

Design: Cross-sectional study design was used.

Methods: One hundred sixty COVID-19 confirmed, and suspected patients were conveniently selected. A structured survey and checklist were utilized. Independent *t* test and chi-square test were employed to compare the mean between patients with confirmed coronavirus infection and others. A two-sided *p*-value of .05 or less is considered statistically significant.

Results: The study yielded a response rate of 93.6%. The result indicated that patients with confirmed coronavirus infection have a higher proportion of perceived General Health Status than inpatients with suspected (other) diagnoses. The finding also indicated that ineffective airway clearance, hyperthermia, imbalanced nutrition less than body requirement and sleep pattern disturbance were the main nursing diagnoses identified.

KEYWORDS

care plan, coronavirus, nurses, nursing, nursing diagnosis

1 | INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease caused by the SARS-CoV-2 virus (World Health Organization (WHO), 2021). COVID-19 has rapidly spread across the world within a shorter time. COVID-19 has enormous implications on healthcare systems, particularly on the nursing workforce (Fernandez et al., 2020). Nurses as

the largest group of health professionals are at the frontline of the healthcare system's response to both disease outbreaks and pandemics (Al Thobaity & Alshammari, 2020). Despite the known contribution of nurses to the pandemic response, there has been very limited mention of nurses' autonomy in applying the nursing process to identify patient needs and with care planning guided using the Nursing Diagnosis Framework (Ackley and Ladwig, 2008).

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The COVID-19 outbreak started in Wuhan Hubei Province, China, where the first cases of an unknown kind of respiratory illness causing pneumonia-type symptoms was detected (Wang et al., 2020). The National Health Commission had received reports of 83,537 confirmed cases and 4,634 deaths in 31 provincial-level regions and the Xinjiang Production and Construction Corps on the Chinese mainland, and in all 78,487 patients had been cured and discharged from hospital. Hubei had reported a total of 68,135 confirmed COVID-19 cases, and 63,623 cases had been cured and discharged from hospitals. The disease has claimed 4,512 lives in the province 2020. On March 19, Wuhan, in central China's Hubei province, had no new cases for the first time since the outbreak began (National Health Commission of the PRC, 2020). Although the cure rate is high, stopping the transmission of COVID-19 remains unoptimistic. Therefore, enhancing the management of hospitalized patients is important for preventing and minimizing the further spread of COVID-19 during this epidemic.

As part of the pandemic response, in the early weeks of March 2020, a total of 28,679 nurses had been sent to Hubei Province to fight against COVID-19 infection (Health News, 2020). Nurses in the front line have a strong sense of responsibility towards patients. Despite the sense of fear and vulnerability, nurses' obligation to take care for patients outweigh their competing commitments to their families and the risk of their own exposure (Pfrimmer, 2009). These showed that nurses' engagement and contribution to the pandemic response have significant clinical and social care implications during the pandemic.

Nurses in the frontline of care utilize a decision-making framework also referred as nursing process in providing care to patients (Ackley and Ladwig, 2008). In the time of pandemic, the nurses' ability to identify patients' needs and the required prioritization of nursing care have never been highly relevant. However, there has been a dearth of evidence on nurses' utility of evidence-based process in the identification of priority patient needs such as using the North American Nursing Diagnosis Association's (NANDA) list of nursing diagnoses, particularly in settings dedicated to caring for COVID-19 patients.

The relevance of nursing diagnoses in a pandemic is expected to be in further development. Recently, nurse experts have identified two additional community level nursing diagnoses related to COVID-19 (Moorhead et al., 2020). Furthermore, there are a combination of nursing diagnoses that were identified and triangulated to be linked with COVID-19 (González-Aguña et al., 2020). A nursing diagnosis is used to determine the appropriate plan of care for the patient. The nursing diagnosis drives interventions and patient outcomes, enabling the nurse to develop the patient care plan. It is important that with the development, nurses' utility of these nursing diagnosis in a time of pandemic is examined. Hence, this study aimed to investigate the health problems and nursing diagnoses among coronavirus confirmed and suspected patients in a hospital located in Wuhan, China during the COVID-19 pandemic. Research questions:

1. Is there a difference in the health status between patients with Coronavirus-19 confirmed and those with suspected (other) patients?
2. What are the commonly used nursing diagnoses utilized?

To answer these research questions, this study aimed in investigating the health problems and nursing diagnoses between patients with coronavirus-19 confirmed and those with suspected (other) patients/cases. In addition, the study aimed to identify nursing diagnoses from patients with coronavirus-19 confirmed and those with suspected (other) patients using a structured checklist from a hospital in China.

2 | METHODS

2.1 | Design and participants

A cross-sectional study design with convenience sampling was used. A specific ward for the infectious disease was selected as the research site where patients with confirmed or suspected coronavirus disease were admitted. Eligible confirmed and suspected COVID-19 patients who were admitted to this ward were invited and recruited between 1 March 2020, and 1 April 2020. Selection criteria were patients aged over 18 years; able to read and understand the content of the survey and who agreed to participate in the study.

2.2 | Data collection

A structured survey was developed by researchers and was distributed by a research assistant in the selected ward. Patients' profiles and nursing diagnoses were also reviewed using a structured checklist and using NANDA-I by a research assistant for data collection. Other admission records were also audited and collected by a research assistant.

2.3 | Variables of interest

Age, gender, length of stay, medical diagnoses during hospital stay, number of co-morbidities, loss of sense of smell, loss of sense of taste and history of surgery/life style-related factors were also collected such as drinking and smoking history.

2.4 | Perceived general health status (GHS)

Instruments to measure perceived general health status was developed by the researchers using a single item question, which asked, "In general, would you say you are currently healthy?," which required "yes" or "no" responses and yielded possible scores of 1 and 0, respectively.

2.5 | Data analysis

All data were entered and analysed using the Statistical Analysis System (SAS 9.4) (SAS Institute Inc., Cary, NC, USA). Descriptive statistics including frequency, percentage, mean and standard deviation were calculated for presenting the distribution of all variables. For inferential statistics, quantile–quantile (Q-Q) plot was prior utilized to test the distribution of the data against the expected normal distribution. Inferential statistics such as independent *t*-test and chi-square test were employed to compare the mean and percentage between patients with confirmed coronavirus infection and others. Missing data were managed by multiple imputation. A two-sided *p*-value of .05 or less is considered statistically significant.

2.6 | Ethics

Ethical approval was granted by BLINDED FOR REVIEW Hospital Ethics Committee. Participants signed the consent form prior to the data collection. Participants were informed of their right to withdraw participation at any time. To ensure that participants were fully aware, the study was explained to them using the participant information sheet and their consent was obtained prior to answering the survey.

3 | RESULTS

From 160 coronavirus-confirmed and suspected patients, 150 valid surveys were returned, yielding a high response rate of 93.75%. From coronavirus-confirmed patients, 51% were accounted by males. The mean age of patients with confirmed coronavirus and inpatients with other diagnosis were 58.1 (*SD* = 16.8) and 59.9 (*SD* = 13.8), respectively. Forty seven per cent of coronavirus-confirmed patients have more than one comorbidity. The percentage of co-morbidities more than one ($\chi^2 = 4.552$, *p* = .033) and smoking history ($\chi^2 = 24.271$,

p < .001) in patients with confirmed coronavirus infection was significantly higher than in patients with other diagnosis. Loss of smell sense and loss of taste sense did not have significant differences between patients with confirmed coronavirus and other diagnosis (Table 1).

Among the comparison of perceived GHS and nursing diagnosis, the results indicated patients with confirmed coronavirus infection have higher proportion of perceived GHS (98.0%) than inpatients with other diagnosis ($\chi^2 = 20.578$, *p* < .001) significantly. Ineffective airway clearance was mentioned as a nursing diagnosis in 47.1% of COVID-19 confirmed cases. Ineffective airway clearance ($\chi^2 = 25.512$, *p* < .001), hyperthermia ($\chi^2 = 4.810$, *p* = .028), imbalanced nutrition less than body requirement ($\chi^2 = 9.700$, *p* = .002) and sleep pattern disturbance ($\chi^2 = 7.170$, *p* = .007) were the main nursing diagnoses identified and the differences in these nursing diagnoses were found between patients with confirmed and suspected coronavirus. Constipation, diarrhoea, fatigue and nausea were not identified as primary nursing diagnoses of both COVID-19-confirmed and suspected cases. These nursing diagnoses were observed from the present health problems of all patients (Table 2).

4 | DISCUSSION

The result indicated that patients with confirmed coronavirus infection have a higher proportion of perceived general health status than inpatients with suspected (other) diagnoses. This study also identified the nursing diagnoses utilized on patients using a structured checklist from a hospital in China. The research also revealed the differences in these nursing problems between patients with confirmed COVID-19 infection and those suspected and unconfirmed cases. The current state of knowledge on COVID-19 clinical manifestations has been heavily focussed on the diagnostic modalities, medical diagnosis and signs and symptoms (Aljondi & Alghamdi, 2020). However, nurses who are usually in the front line of health care, provide care interventions following a nursing

TABLE 1 Demographic characteristics (N = 150)

Characteristics	Coronavirus confirmed (n = 51)	Coronavirus suspected (n = 99)	<i>t</i> / χ^2	<i>p</i> -Value
	<i>n</i> (%) / <i>M</i> (<i>SD</i>)	<i>n</i> (%) / <i>M</i> (<i>SD</i>)		
Age	58.1 (16.8)	59.9 (13.8)	-0.685	.495
Length of stay	17.1 (12.3)	18.4 (10.8)	-0.709	.480
Male	26 (51.0)	48 (48.4)	0.084	.772
Co-morbidities > 1	24 (47.0)	30 (30.3)	4.552	.033
Anosmia/Loss of smell sense	0 (0.0)	4 (4.0)	2.117	.300 ^a
Ageusia/Loss of taste sense	2 (3.9)	11 (11.1)	2.198	.220 ^a
History of surgery	12 (23.5)	20 (20.2)	0.252	.616
Drinking	11 (21.5)	14 (14.1)	1.469	.717
Smoking	19 (37.2)	6 (6.0)	24.271	<.001

^aFisher's exact test.

TABLE 2 Comparison of perceived general health status and nursing diagnosis between coronavirus and other patients (N = 150)

Variables	Coronavirus confirmed (n = 51)	Coronavirus suspected (n = 99)	χ^2	p-Value
	n (%)	n (%)		
Good perceived GHS	50 (98.0)	64 (64.6)	20.578	<.001
Nursing diagnosis				
Airway Clearance: Ineffective airway clearance	24 (47.1)	85 (85.9)	25.512	<.001
Constipation	2 (3.9)	5 (5.1)	.096	.555 ^a
Diarrhoea	1 (2.0)	5 (5.1)	.837	.664 ^a
Fatigue	8 (15.7)	9 (9.1)	1.457	.227
Hyperthermia (Fever)	43 (84.3)	94 (94.9)	4.810	.028
Nausea	2 (3.9)	8 (8.1)	.936	.275 ^a
Nutrition: Imbalanced nutrition <body requirements	2 (3.9)	24 (24.2)	9.700	.002
Sleep pattern disturbance	20 (39.2)	61 (62.2)	7.170	.007

Abbreviation: GHS, General Health Status.

^aFisher's exact test.

care plan that are based on the nursing problems they have identified (Ellis, 2020; Rinenggantyas & D., 2020). Our findings are the first of its kind, which focused on nursing diagnoses and the problems identified by nurses providing care to patients during the COVID-19 outbreak.

The nursing problems identified were like the known signs and symptoms of COVID-19. Hyperthermia and Ineffective Airway Clearance are the most frequently used nursing diagnoses for COVID-19 patients, being a respiratory infection, these are expected. However, it can be noted that there is a higher percentage of these identified nursing issues with the non-confirmed cases of COVID-19. These nursing problems identified supported clinical evidence that have been noted in the recent studies of COVID-19-infected individuals yet remained asymptomatic (He et al., 2020).

In some studies, the proportion of poor perceived health was high among COVID-19-infected patients due to different reasons (Khan et al., 2021; Qiu et al., 2020). However, our result showed that people infected with COVID-19 have better perceived health status than those who were only suspected cases. This might be linked to the higher percentage of comorbidities in non-infected groups.

As a respiratory condition, COVID-19, is expected to affect the lungs and worst outcomes have been noted in patients with respiratory risk factors like smoking history (Zhao et al., 2020). This was significantly noted among COVID-19 positive patients in this current study. However, smoking history might not have a direct link with the immediate nursing issues such as airway problems, which was higher in non-confirmed and with those treated for other respiratory conditions during the pandemic period.

According to the findings of this study, only a few patients had loss of smell and taste sense, and there were no significant differences between patients with confirmed coronavirus and other diagnoses. This contradicts other study which have found

that a significant proportion of patients with COVID-19 may develop long-term changes in their sense of smell or taste (Tan, et al., 2022).

Overall, our findings as per nursing problems identified suggested that non-infected patients have a higher percentage of experiencing common nursing issues than the COVID-19 positive patients, such as Airway Clearance: Ineffective airway clearance, Constipation, Diarrhoea, Fatigue, Hyperthermia (Fever), Nausea, Nutrition: Imbalanced nutrition less than body requirements and Sleep pattern disturbance. COVID-19 is a serious respiratory infection; however, symptoms vary from infected individuals which could be the reasons why nursing problems are experienced differently. Nurses' ability to identify nursing issues in pandemic infection like COVID-19 might be under-estimated in COVID-19 treatment response. However, it should be noted that recovery from COVID-19 is high and during hospitalization periods, nurses cater to these identified nursing issues than specialized tasks in intensive care units. NANDA is relevant and valuable in the care provided to patients during a pandemic like COVID-19 where, nurses are in the front line of care.

5 | CONCLUSION

Assessing and determining the perceived health status of patients confirmed or suspected with COVID-19 will help in providing a person-centred care. The identification of nursing problems using the NANDA framework is helpful in planning and providing care for patients affected by health conditions of pandemic nature. Nurses provide holistic care to patients affected by COVID-19; therefore, it is important that a nursing care framework that recognizes comprehensive and multifaceted nursing problems are utilized in pandemic response.

6 | IMPLICATIONS FOR NURSING PRACTICE AND RESEARCH

Not only in the usual nursing care setup but also nursing care in an emergency, outbreak and pandemic settings should follow an evidence-based practice. Such evidence-based practices can improve emergency nursing care of patients diagnosed with COVID-19 and optimize patient outcomes. This study tries to sort out the common nursing diagnoses experienced by patients confirmed with COVID-19. Nurses who are working in clinical settings in which direct COVID-19-related nursing cares are provided may benefit from this study. Furthermore, researchers may utilize this study as a reference to scaling up of further research using different designs. The most identified nursing diagnoses for COVID-19 in this study provide evidence-based insight into nurses' scope of practice in providing nursing care for COVID-19-confirmed patients.

7 | LIMITATIONS

There were some limitations in this study. The perceived general health status question used was not a validated survey item. Data were collected from a single hospital in Wuhan, China, thus, the results of this study may not be generalizable to other countries. Nevertheless, this is the first study collecting data about the nursing diagnosis during the COVID-19 outbreak from Wuhan, China. Our findings revealed that using nursing diagnosis in patients with confirmed coronavirus and suspected cases cater to the clinical needs of patients in a pandemic. It can provide supporting evidence for front-line nurses to consider and further care plan development at an early stage.

AUTHOR CONTRIBUTIONS

HCC contributed to conceptualization, formal analysis and methodology. MHH and JM contributed to conceptualization, formal analysis, methodology and writing—review and editing. WQZ and FY contributed to data curation and project administration. ASK contributed to revising and reviewing and editing the manuscript.

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (<http://www.icmje.org/recommendations/>)]:

- substantial contributions to conception and design, acquisition of data or analysis and interpretation of data.
- drafting the article or revising it critically for important intellectual content.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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