ASSESSING THE LEVEL OF KNOWLEDGE AND FUNCTION OF NURSES ABOUT COVID-19 DISEASE DURING THE EPIDEMIC

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ABSTRACT

Introduction: *Covid-19 is a dangerous respiratory disease, and nurses are exposed to this virus at work. Thus, nurses need to understand the process of awareness and proper practice about COVID-19. Nurses' knowledge and readiness are important for the effectiveness of corona treatment. This study was conducted to investigate the knowledge and readiness of nurses in this field.*

Materials and methods: *In this study, 264 nurses of Shanghai Hospital participated in the survey from November to August 2021. The instrument was a modified questionnaire related to nurses' performance and knowledge about COVID-19. Data were analyzed by SPSS software.*

Results: *A total of 253 people answered the questionnaire. The mean age of nurses was 34.8 years. General knowledge of COVID preparation was sufficient. The nurse's readiness for personal protective equipment was moderate. The overall response was 94.3%. The majority of respondents (96.2%) were employed by the Ministry of Health. According to reports of 88.4% of participants, there was adequate ventilation in the workplace. In total, 81.7% of respondents wore enough gloves and gowns. About 22.4 % of participants lacked a cape, 12.9 % had an N95 mask, and 28.5 % lacked facial protection.*

Conclusion: *Nurses were knowledgeable enough and moderate in terms of preparation and response to Covid-19. Paying more attention to these issues can contribute to greater efficiency and health of medical staff in the future.*

Keywords: *Preparedness, COVID-19, education, awareness, nurses.*

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Introduction

Coronaviruses are a group of old, common, and diverse enveloping viruses that cause diseases of respiratory, gastrointestinal, and central nervous systems[1, 2]. This has increased the damage and the difference in symptoms in this virus[3, 4]. Studies show that by the end of September 2021, about two hundred and thirty million people in the world have been infected with the Covid-19 virus, of which nearly 5 million have lost their lives[5]. Old age, underlying diseases (such as heart failure, respiratory diseases, diabetes, chronic lung disease, hypertension, cancer, brain disease, kidney disease, and liver disease) are among the fundamental risk factors[6, 7]. Many viruses that infect the human body are recognized and controlled by the body's immune system[8]. Immune system cells kill dangerous pathogens in a multilateral collaboration. Awareness of factors affecting the immune system and the body's function against the virus is important during treatment[9, 10]. The role of nurses is vital during the Covid-19 epidemic. Nurses must take care of patients at all stages; thus, their knowledge and skills play an important role in the quality of patients' treatment. The role of nurses is also very important

in crisis management, which is a central issue in this involvement[11]. Studies show that many nurses have been infected with COVID-19 so far, and most cases occur in intensive care and emergency departments, which are highly susceptible to COVID-19. However, knowledge of medical staff about the virus and its transmission routes, observance of hygiene principles, and personal protective equipment (PPE) significantly reduce the transmission rate and risk of COVID-19[12]. In addition, paying attention to providing educational solutions and improving the knowledge of medical staff can also be effective in reducing the incidence of COVID-19[13]. Studies have shown that providing facilities, training, and awareness among nurses can effectively prevent coronary heart disease and reduce the number of deaths in health centers[14].

One of the most important groups of health care professionals at the time of Covid-19 involvement is nurses. They spend much time with patients with the virus. As a result, providing educational and preparation solutions for scientific and practical disease prevention can be a good way for more patients' health[14, 15]. In the corona crisis, nurses' knowledge and attitudes about COVID-19 and the application of Personal Protection Equipment (PPE) standards are important[15].

Corona management and management constraints are some of the challenges facing medical staff[16]. Due to the importance of this issue, our study was conducted to evaluate the knowledge and readiness of nurses in relation to COVID-19 in the body.

Materials and methods

Study design

In this cross-sectional study, 264 nurses were selected from November to August 2021 after reviewing the inclusion criteria.

Samples were available; after visiting Shanghai Hospital and after the administrative process, sampling was done, and questionnaires were sent online to nurses.

Entry and exit criteria

Nurses from the intensive care unit and the coronation ward who were in the hospital during the epidemic and were willing to participate in the study were included. Exclusion criteria included a history of chronic disease and an unwillingness to participate in the study.

Ethical considerations

In an introductory session, the researcher explained the goals and nature of the research to the individuals and obtained their consent to participate in the research. All participants in the study were assured that the information in their questionnaires would be kept confidential and reminded that they would be provided with the study results if they wished.

Measuring tools

Nurse preparation and response to the COVID-19 online survey questionnaires were sent to Shanghai Hospital Nurses. The instrument used for this study was the modified WHO-Hospital Readiness Checklist for COVID-19 (14, 15). This questionnaire included five areas. The first part of the questionnaire was related to the demographic information and personal information of the participants. The second part consisted of six questions related to evaluating nurses' knowledge about COVID-19 readiness. The third section consisted of 10 questions about assessing the overall readiness of facilities and preparation to respond through approaches such as triage/screening.

The fourth section consisted of 12 questions that identified nurses' overall responses to PPE management, training, and safety precautions. Section 5 had a question to determine nurses' knowledge of PPPs. Nurses scored one point for each correct answer and zero points for each incorrect answer. The score of the questionnaire varied between 0 and 32. In this study, participants with high scores of 21 points showed a high level of knowledge. As a result, those who scored between 10 and 20 points had mediocre knowledge, and those who scored below 10 points showed insufficient readiness.

Data analysis method

Data were recorded in pre-compiled collection forms and entered into SPSS statistical analysis software version 23 for analysis. They were analyzed using t-test, Pearson correlation, and Chi-square test. In all tests, the confidence level was 95%, and the significance level was less than 0.05.

Results

A total of 253 people answered the questionnaire. The mean age of nurses was 34.8 years. According to Table 1, the overall response was 94.3%. The majority of respondents, 96.2%, were employed

by the Ministry of Health. 91.9% of nurses stated that information on training in the identification and optimal treatment of COVID-19 was provided in the workplace. 95.3% of respondents stated that they followed the instructions to isolate patients with possible symptoms of COVID-19. 88.4% said there was adequate ventilation in the workplace. About 83.5% reported the availability of airborne isolation rooms ("negative pressure rooms") in their units.

Regarding nurses' readiness, the findings showed that 79.3% of them were aware of WHO guidelines for COVID-19 preparation, and about 93.4% reported that nurses were ready to care for COVID-19 patients. 90.5% were aware of the current state of the country and society. 97.4% of coughs, shortness of breath, fever, and sore throat were considered symptoms of COVID-19. 93.2% of nurses knew about preventive measures, and 81.4% knew about risk factors.

Percentage %	Category	Variable	
96.2	Yes	Are you employed by the Ministry of Health?	Baseline Information of the Nurses.
1.2	No		
91.9	Yes	Is there any training on the new Coronavirus at work?	
8.1	No		
95.3	Yes	Is there a special program to isolate patients?	
4.7	No		
88.4	Yes	Is there proper ventilation in the workplace?	
11.6	No		
83.5	Yes	Is there an airborne infection room in your workplace?	
15.5	No		
79.3	Yes	Does the nurse have enough information about COVID-19 preparation according to WHO guidelines?	Nurses Knowledge on COVID-19-19 Preparedness
20.7	No		
93.4	Yes	Are nurses prepared to care for COVID-19 patients?	
6.6	No		
90.0	Yes	Is the nurse aware of the current situation in the country, the status of his / her place of residence, and his / her community?	
9.5	No		
97.4	Yes	Does the nurse correctly identify the main signs of Coronavirus?	
2.6	No		
93.2	Yes	Does the nurse know the preventive measures to prevent the disease?	
6.8	No		
81.4	Yes	Does the nurse know the preventive measures to prevent the disease?	
8.6	No	Do nurses have the necessary knowledge about coronary risk factors?	

Table 1: Basic findings and knowledge of nurses according to the questionnaire.

About the readiness and performance levels, 87.3% explained the cause of triage and screening to all patients. 99.4% stated that the hospital has a screening area designated for temperature monitoring. Of the adequacy of accessories such as gloves, face masks, and PPE, 76.3% said they were sufficient. A total of 38.3 % of nurses indicated that they did not have a well-ventilated isolation room. 77.9 % of respondents reported that there was congestion next to the facility. 39.6% of participating nurses maintained a distance of at least 2 meters (arm's length) with other nurses and patients. About 98.4% of respondents mentioned that all patients were asked about the symptoms of COVID-19 before being allowed to enter the hospital (Table 2).

Percentage %	Category	Variable	
96.2	Yes	Do health care workers explain the cause of triage/screening to patients?	Response Readiness on Triage/ Screening.
1.2	No		
91.9	Yes	Is a screening site designed to check the temperature before the patient enters a health care center?	
8.1	No		
95.3	Yes	Are suitable sources of gloves, face masks, and personal protective equipment available for use by health professionals?	
4.7	No		
95.3	Yes	Is there an isolated room with good ventilation?	
4.7	No		
88.4	Yes	Is there a crowd next to the sanitary facilities?	
11.6	No		
83.5	Yes	Is there a distance of at least 2 meters (arm's length) between nurses and patients?	
15.5	No		
79.3	Yes	Have patients been asked about the symptoms of COVID-19 infection before entering medical facilities?	
20.7	No		

Table 2: Findings of nurses' readiness and performance.

According to Table 3, the results of nurses' efficiency and effectiveness in the COVID-19 epidemic showed that 60.2% of nurses had appropriate PPEs. 69.3% stated that their workplace has sufficient PPEs. 98.7 nurses were trained on how to use PPPs. 98.3% had a respiratory test at their hospital.

A total of 79.3% reported their workplace to have a codified plan for caring for nurses and patients in isolated rooms. 91.5% reported disclosed or suspected cases among physicians with a policy. About 93.6% reported that screening rooms and isolation rooms were provided for symptomatic patients. Suitable personnel for crisis management was 68.4%.

Regarding managerial and supportive activities, 91.2% of the respondents received sufficient support from their managers. 93.5 nurses explained teamwork as fast. 81.7% of participants received adequate training in COVID-19 control and prevention measures.

Percentage %	Category	Variable	
60.2	Yes	Are there any additional PPEs	Nurse's affective response to COVID-19.
39.8	No		
69.3	Yes	Is there enough equipment available at your workplace to protect personnel in the event of a rapid increase in patients with potential coronavirus infections?	
30.7	No		
98.7	Yes	Have you been trained on safely donning and doffing PPE?	
1.3	No		
98.3	Yes	Have you been tested for health and respiratory volume in your hospital?	
1.2	No		
79.3	Yes	Does your workplace have an overflow plan to place additional, trained staff to provide safe care to patients in isolation for possible novel coronavirus?	
20.7	No		
91.5	Yes	Does your workplace have a specific protocol for dealing with suspected or infected employees exposed to the Coronavirus?	
8.5	No		
93.6	Yes	Has your workplace implemented informational campaigns or other secondary screening isolation to ask patients with symptoms and travel/exposure history to call ahead to the hospital before coming in?	
6.4	No		
83.5	Yes	Have any patients at your facility been identified as possible coronavirus cases to the best of your knowledge?	
15.5	No		
79.3	Yes	Has your hospital ensured appropriate staffing for possible novel coronavirus infections?	
20.7	No		
91.2	Yes	Does your management support your activities	
8.8	No		
93.5	Yes	Has your hospital/workplace ensured Rapid Response Team?	
6.5	No		
81.7	Yes	Have you attended any training program on novel Coronavirus?	
8.3	No		

Table 3: Results of nurses' efficiency and effectiveness over time.

Regarding personal protective equipment (PPE), a total of 81.7% of respondents wore adequate gloves and gowns. About 22.4 % of the participants lacked a cape, 12.9 % had an N95 mask, and 28.5 % lacked facial protection (Table 4).

Variable	Category	Yes, I have access to my unit.	Sort of, I have to go somewhere else in the facility to get it.	No, I don't have any access	I don't know
Do you have access to sufficient personal protective equipment (PPE) (PPE) for airborne precautions	Gloves	81.7%	17.4%	2.9%	0.00
	Gowns	86.3.%	12.9%	1.8%	0.00
	Coveralls	51.7%	22.4%	19.8%	6.1%
	N95 Respirator	77.8%	15.5%	4.9%	2.80
	Face Shield	68.2%	28.5%	3.2%	0.10
	PAPR (Powered air-purifying respirator)	40.9%	21.9%	31.9%	5.3%

Table 4: Nurse's readiness on Peroneal Protective Equipment.

Discussion

The health of nurses as momentous members of medical staff is very important to survive this epidemic and any other medical or health crisis. For this reason, it is necessary to be fully aware and prepared about this disease[17]. Nurses should be educated on ways to prevent coronary heart disease, know the virus scientifically, and be trained on the best conditions for coping with the virus. In this regard, the American Nurses Association helps deliver strategic support to control and prevent the spread of coronary arteries by providing conditions[18].

This study showed that nurses were dependent on PPE to protect themselves and patients from contracting and transmitting the infection. Therefore, having proper personal protective equipment in the workplace is essential. Of course, there is PPE deficiency, which means that nurses, physicians, and others at the forefront of treatment are not equipped to care for patients with COVID-19 while protecting themselves from infection. Thus, the WHO reports that severe global supply disruption and improper PPE usage predispose frontline physicians to infection[15, 17]. The study reported that nurses needed to be familiar with COVID-19-related health protocols, early infection detection/control guidelines, and preventive measures in health care settings[20, 19]. The present study results showed that the general knowledge of nurses about COVID-19 readiness was acceptable. However, nurses' readiness for PPE was moderate. Also, the proposed strategies for exposure prevention, screening, and diagnosis among nurses were moderate. Therefore, these results show that nurses need more preparedness to deal with COVID-19 to increase their knowledge in prevention, control, and management. Recent studies have shown that cases of infection prevention, the most important of which is the ventilation of rooms for the care of coronary heart disease patients and their screening, are not well observed, confirming the results of our study on moderate prevention[19, 21].

The present study showed nurses' readiness for triage and screening. Most of the samples reported the presence of a screening area to monitor the temperature and symptoms of COVID-19, as well as isolated and well-ventilated rooms for approved cases. The nurses followed the social distance and the COVID-19 guidelines well; however, some of them needed to become more familiar with the triage and screening guidelines. The same findings suggest the need for prompt intervention, health promotion,

education, planning to empower, and support programs among nurses, although studies have shown that most nurses follow the WHO guidelines for COVID -19[22]. The World Health Organization (WHO) guidelines for Covid-19 emphasize disease control and disruption of its chain, as well as paying more attention to older patients due to the risk factor. If possible, children and families should not go to the hospital to see sick family members[23].

According to the present study, 81.7% of nurses wore sufficient gloves and gowns. About 22.4 % of the participants lacked a face mask, 12.9 % had an N95 mask, and 28.5 % lacked facial protection. Morley et al. (2021) state that the importance of personal protective equipment (PPE) for nurses is crucial in the global fight against COVID-19[24]. Another study reported that health care nurses experienced increased exposure to Covid-19 and PPE long shifts. In this public health emergency, their presence is crucial in protecting patients. Of course, personal protection is also important to protect their health[25]. As a result, having adequate personal protection resources to combat this epidemic is inevitable.

Similar findings regarding nurses' use of PPEs in the UK have shown a lack of some protective features, which is consistent with the present study. Many studies have alerted nurses to how to use PPEs. They have stated that reusing PPEs is a dangerous practice because it increases the risk of virus exposure[23, 26]. Another observational study has found that the lack of surgical masks is a problem for medical staff, with many nurses using a mask for a full shift. Findings indicate that nurses' caring role has expanded during the outbreak. Therefore, it shows the importance of sufficient human resources to provide quality services to patients during the epidemic[27]. Also, some studies have reported that nurses who suffer from coronary heart disease, after recovery, face complications such as respiratory problems and hair loss. It is worthwhile for health organizations to grant concessions to these loved ones as well[28]. World health officials should keep in mind that the death of nurses, in addition to the psychological damage it inflicts on the families of these loved ones[23, 25], also causes discomfort and psychological damage in the nursing community, causing frustration and reducing the efficiency of the group. Therefore, paying more attention to them and their health is very important.

The present study showed that a percentage of nursing groups faced severe personnel shortages for crisis management. Many recent studies support this finding. At the beginning of this conflict, China and the United States faced severe challenges due to labor shortages[29]. This shortage of nursing staff has also been observed in India[30].

Our study generally focuses on the performance and readiness of nurses and other factors affecting nurses' performance. Findings indicate that further understanding the strengths and weaknesses of the nursing staff in relation to controlling the Coronavirus and providing protective facilities should be a priority.

Conclusion

The findings of the study showed that nurses were knowledgeable enough and moderate in terms of preparation and response to Covid-19. However, there were strengths and weaknesses in some aspects, including access to security. Paying attention to this issue can help the health of medical staff in the future. It is suggested that future studies be conducted to identify more factors affecting the health of nurses and other treatment staff in the Covid-19 epidemic.

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