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Knowledge of Nurses in Covid-19 Patients Management in a Tertiary Level Hospital

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Abstract

Background: The COVID-19 pandemic has placed unprecedented demands on healthcare systems worldwide. Nurses, as frontline caregivers, play a critical role in the management, prevention, and control of COVID-19 infections. Adequate knowledge among nurses is essential to ensure effective patient care and reduce transmission risk in healthcare settings. ***Aim of the study:*** This study aimed to assess the knowledge of nurses regarding COVID-19 patient management in a tertiary-level hospital in Bangladesh and to analyze factors associated with their knowledge levels. ***Methods:*** A descriptive cross sectional study design was used and sample size 320 that was convenient sampling technique followed those who meet the inclusion criteria and to assess the state of knowledge of nurses in COVID-19 patients' management in a tertiary level hospital at Faridpur Medical College Hospital, Faridpur. The study was conducted from January 2020 to December, 2020. The instruments for data collection were a semi-structured questionnaire which composed of two parts: Demographic variables, and knowledge on management based information on covid-19. ***Result:*** The findings revealed that the highest, 45.3% from 36 –5 years age group and 93.1% nurses were female, in educational qualification were diploma in nursing 86.6 %, and 85.3% were married and 53.8% were less than 5 years working experiences. This study's main findings revealed the average 52% respondent's knowledge was good, as well as 28% respondent's knowledge was fair, and 20% respondent's knowledge was poor about covid-19 management. Regarding the association, the finding was a significance association present between nurse's work experiences and level of knowledge of nurses on prevention and control of COVID-19 ($\chi 2 = 23.06$, P<.003). On the other hand, there were no significance association between nurse's educational qualification and level of knowledge of nurses on prevention and control of COVID-19 ($\chi 2 = 8.47$, P<.076). It's may due to their clinical experiences. ***Conclusion:*** The findings suggested for improving the situation of nurses about health care associated knowledge by training, higher education, seminar and workshop of COVID-19 patient management in a tertiary level hospital and providing comprehensive psychological support to the nurses in order to prevent stress disorder.

Keywords: COVID-19, Nurses, Patient Management, Knowledge, Infection Control, Tertiary Hospital, Bangladesh.

INTRODUCTION

Bangladesh is currently battling the coronavirus disease (COVID-19), an infectious illness caused by the novel SARS-CoV-2 virus. COVID-19 is primarily transmitted from person to person through respiratory droplets and direct contact, with an incubation period ranging from 2 to 14 days [1]. The disease was first reported in December 2019 by Chinese authorities in Wuhan city, the capital of Hubei province in China [2]. The COVID-19 pandemic has emerged as a significant global health crisis. SARS-CoV-2, the causative agent of COVID-19, is the latest identified member of the coronavirus family and has been responsible for severe acute respiratory distress syndrome (ARDS), pneumonia, and respiratory failure in humans [3]. The first identified patient presented with fever, cough, and severe dyspnea on December 12, 2019, in Wuhan, China [4]. Globally, COVID-19 has had devastating effects on elderly populations, who are at a heightened risk of developing life-threatening complications due to age-related physiological changes. With advancing age, immune system function declines, and the elderly exhibit increased production of inflammatory mediators and cytokines—a condition termed "inflammaging"—which amplifies their response to viral infections [5]. Patients with mild symptoms—those without viral pneumonia or hypoxia—may not require hospitalization and can often

be managed at home [6]. Clinical decisions regarding inpatient versus outpatient care should be made on a case-by-case basis, considering factors such as symptom severity, the need for supportive care, risk of progression to severe illness, and the ability to self-isolate. Patients at higher risk for complications must be closely monitored, particularly during the second week after symptom onset [7]. Nurses play a critical role during the COVID-19 pandemic, both in hospital-based patient care and in community surveillance. They are responsible for ensuring that all patients receive high-quality, individualized care, regardless of infection status [8]. Additionally, nurses are engaged in outbreak preparedness and response, which includes planning for increased demand, ensuring supplies of sanitation materials and PPE, and disseminating accurate screening and triage information [9]. During such crises, nurses face ethical and practical challenges, particularly when resources are scarce, and the infection is highly contagious. They must balance caring for patients with self-protection [10]. As frontline workers, nurses are at elevated risk of infection and must be equipped with adequate PPE—ventilators, masks, gowns, eye protection, and gloves—as well as proper training and guidance tailored to emerging COVID-19 challenges [11]. There is currently a lack of empirical data in Bangladesh regarding nurses' knowledge, attitudes, and perceptions about the COVID-19 outbreak. Since nurses are first-line responders, understanding their knowledge and preparedness is critical for breaking the transmission chain. It also provides foundational insights for healthcare system planning, capacity building, and workforce support [12]. This study aims to assess the knowledge of nurses regarding the management of COVID-19 patients in a tertiary-level hospital.

METHODOLOGY & MATERIALS

A descriptive cross-sectional study was conducted in the COVID-19 dedicated unit of Faridpur Medical College Hospital, a tertiary-level government hospital in Bangladesh, over a one-year period from January 1 to December 31, 2020. A total of 320 nurses were included in the study.

Inclusion and Exclusion Criteria

Inclusion Criteria:

- Nurses of any sex working for at least three months in the COVID-19 unit.
- Nurses available during the data collection period.
- Nurses who voluntarily consented to participate.
- Nurses physically healthy and mentally sound.

Exclusion Criteria:

- Nurses who were infected with COVID-19, seriously ill, or on leave.
- Nurses who declined to participate or withheld informed consent.

Data Collection

Data collection was conducted using a semi-structured, pre-tested questionnaire specifically developed to assess the knowledge of nurses regarding the management of COVID-19 patients. The questionnaire was initially prepared in English and subsequently translated into Bengali to ensure linguistic clarity and cultural appropriateness for the participants. It comprised both multiple-choice and dichotomous (yes/no/don't know) questions aligned with the study objectives. Prior to the main data collection, a pilot test was carried out on a small group of eligible nurses to refine the questionnaire for clarity, relevance, and reliability. Trained data collectors conducted face-to-face interviews with participants in designated private settings to ensure confidentiality and minimize response bias. Each interview was preceded by a brief explanation of the study's purpose and procedures, followed by obtaining written informed consent. The data collection process was carried out in full compliance with health and safety protocols, especially considering the ongoing COVID-19 pandemic, to ensure the safety of both participants and researchers.

Scoring and Knowledge Classification

The questionnaire comprised 31 items assessing knowledge of COVID-19 patient management. Multiple-choice items and dichotomous (yes/no/don't know) questions were scored as 1 point for a correct/affirmative response and 0 for an incorrect/negative/don't know response. Total raw scores ranged from 0 to 31, which were converted to percentages. Knowledge levels were categorized as follows [13]:

- **Poor:** ≤ 50%
- **Fair:** 51–80%
- **Good:** ≥ 81%

Data Management and Analysis

Completed questionnaires were checked for completeness, coded, and entered into IBM SPSS Statistics version 25. Descriptive statistics (means, standard deviations, frequencies, and percentages) summarized participants' characteristics and knowledge scores. The chi-square test and independent t-test were used to examine associations between demographic variables and knowledge levels, with a two-tailed significance level set at $\alpha = 0.05$.

Ethical Considerations

The study protocol was approved by the Institutional Review Board of NIPSOM. Participation was voluntary, data were anonymized, and confidentiality was strictly maintained throughout the study.

RESULT

Among the 320 respondents, the majority were female (234; 73.1%), with males comprising 86 (26.9%). The predominant age group was 30–39 years (162; 50.6%), followed by 20–29 years (98; 30.6%). The mean

age was 22.5±4.9 years. Most participants were Muslim (306; 95.6%) and married (268; 83.8%). In terms of education, 194 (60.6%) held a diploma in nursing science and midwifery. Regarding professional experience, 178 (55.6%) had less than five years of service, and 124 (38.8%) were employed in medical wards (Table 1). When asked about the incubation period of COVID-19, 178 (55.6%) correctly identified it as 7–14 days, while 82 (25.6%) chose 14–21 days and 60 (18.8%) said less than 7 days (Table 2). On symptoms and transmission, 302 (94.4%) recognized fever, 278 (86.9%) mentioned dry cough, and 290 (90.6%) understood that asymptomatic individuals can transmit the virus (Table 3). Table 4 shows that most respondents (225; 70.3%) correctly identified elderly people with co-morbidities as the highest risk group. A smaller group (92; 28.8%) considered any age group at risk. Most respondents (292; 91.3%) knew that the lungs are the primary organ affected by COVID-19 (Table 5). Table 6 reflects high awareness of management facilities, with over 96% acknowledging the presence of triage areas, isolation wards, PPE supplies, RT-PCR testing (100%; 320 respondents), and ICU facilities. As illustrated in Figure 1, overall knowledge of management facilities was categorized as good in 310 (96.9%) and fair in 10 (3.1%). 308 (96.3%) knew about the guidelines, and most reported proper use of gloves (319; 99.7%) and masks (318; 99.4%). However, only 107 (33.4%) received formal training in patient management, and 117 (36.6%) in PPE donning and doffing (Table 7). Table 8 shows no significant association between educational qualification and knowledge level ($p = 0.076$), with the majority across qualifications demonstrating fair to good knowledge. Knowledge on prevention and control was poor in 166 (51.9%), fair in 110 (34.4%), and good in only 44 (13.8%) (Figure 2). Table 9 finds a significant association between work experience and knowledge level ($p = 0.003$); notably, 104 of 172 respondents with less than 5 years' experience had good knowledge, while fewer with longer experience showed similar knowledge levels.

Table 1: Distribution of the respondents according to the baseline demographic characteristic (n=320)

variable	Frequency (n)	Percentage (%)
Age in years		
20-29	106	33.13
30-39	135	42.19
40 -49	65	20.31
50 to above	14	4.38
Mean (± SD)	22.5±4.9	
Gender		
Male	22	6.88
Female	298	93.13
Religion		
Muslim	240	75.00
Hindu	78	24.38
Christian	2	0.63
Marital status		
Unmarried	44	13.75
Married	273	85.31
Widowed	3	0.94
Divorced	0	0.00
Education		
Diploma in nursing science & midwifery	277	86.56
Bachelor of science in nursing / Public health nursing (B.Sc)	30	9.38
Masters in nursing / Public Health (MSN/MPH)	13	4.06
Work experience in years		
<5	172	53.75
5-10	66	20.63
11-15	20	6.25
16-20	28	8.75
>20	34	10.63
Area of Practice		
Outpatient Department	57	17.81
Surgical Department	75	23.44
Emergency Department	35	10.94
Operating Room	39	12.19
Intensive Care Unit	27	8.44
Medical Department	87	27.19

Table 2: Distribution of the respondents according to general knowledge about incubation period of COVID-19 (n=320)

Incubation period of COVID -19	Frequency (n)	Percentage (%)
Less than 7 days	53	16.56
7 to 14 days	178	55.63
14 to 21 days	64	20.00
21 to28 days	20	6.25
More than 28 days	4	1.25
Total	**320**	**100.00**

Table 3: Distribution of the respondents according to general knowledge about symptoms of COVID-19 and no symptoms but can transmit infection

Symptoms, no symptoms and transmits infection	Yes	No	Don't know
	n (%)	n (%)	n (%)
Fever, body ache, dry cough symptoms of COVID-19	313(97.81)	7 (2.19)	0.00
No symptoms but can transmit infection	314 (98.13)	6 (1.88)	0.00

Table 4: Distribution of the respondents according to general knowledge about risk groups getting infected.

Risk groups getting infected	Frequency (n)	Percentage (%)
Old people with co-morbidities	225	70.31
Young adults	3	0.94
Any age group	92	28.75
Total	**320**	**100.00**

Table 5: Distribution of the respondents according to general knowledge about COVID-19 which organs affect the most

COVID-19 Which organs affect the most	Frequency (n)	Percentage (%)
Lungs	317	99.06
Heart	3	0.94
Liver	0	0.00
Kidney	0	0.00
Brain	0	0.00
Total	**320**	**100.00**

Table 6: Distribution of the respondents according to knowledge on management facilities of COVID-19

Knowledge on management facilities of COVID-19	Yes	No	Don't know
	n (%)	n (%)	n (%)
Triage area for COVID	312 (97.50)	6 (1.88)	2 (0.6)
Isolation ward for COVID-19	319 (99.69)	1 (0.31)	0(0.00)
Quarantine system provided	315 (98.44)	5 (1.56)	0(0.00)
Sufficient supply of PPE	309 (96.56)	11 (3.44)	0(0.00)
Separated rooms for donning and doffing	314 (98.13)	6 (1.88)	0(0.00)
Supply of hand sanitizer	317 (99.06)	3 (0.94)	0(0.00)
Facilities for RT-PCR	320(100.00)	0(0.00)	0(0.00)
Adequate supply of drugs	317 (99.06)	3 (0.94)	0(0.00)
ICU facilities	319 (99.69)	1 (0.31)	0(0.00)
Central oxygen supply in ICU	309 (96.56)	11 (3.44)	0(0.00)

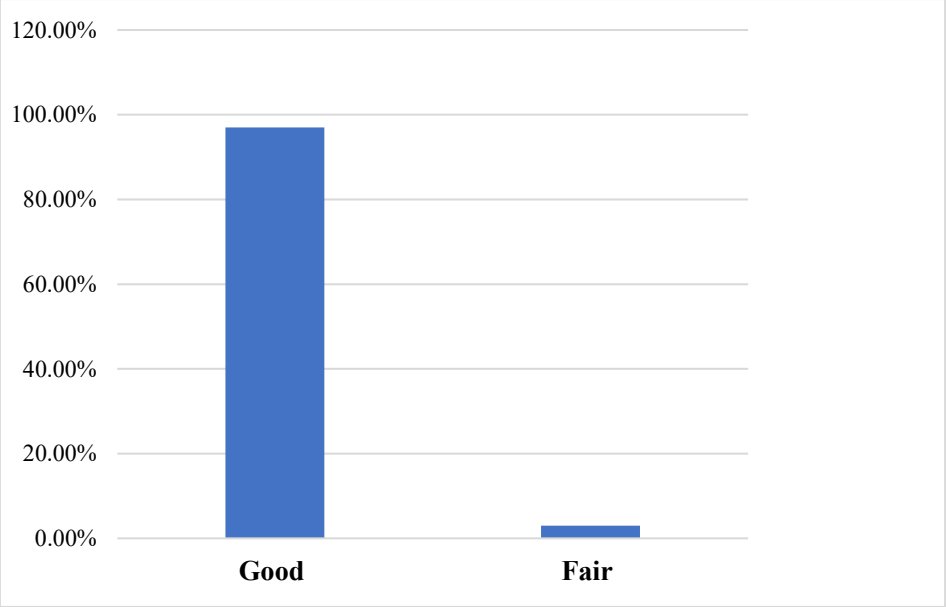

Figure 1: Distribution of the respondents according to knowledge on management facilities of COVID-19

Table 7: Distribution of the respondents according to knowledge on COVID-19 patients' management guidelines

Knowledge on COVID-19 patient's management	Yes	No	Don't Know
	n (%)	n (%)	n (%)
Guidelines for COVID-19 patient management	308 (96.25)	12(3.75)	0(0.00)
Training of COVID-19 patient management	107 (33.44)	213 (66.6)	0(0.00)
Training about donning and doffing of PPE	117 (36.56)	203 (63.44)	0(0.00)
Wear gloves properly	319 (99.69)	1 (0.31)	0(0.00)
Wear of Face Mask/ N95 Properly	318 (99.38)	2 (0.63)	0(0.00)
Proper hand hygiene guided by WHO	318 (99.38)	2 (0.63)	0(0.00)
Hand wash after handling of each patient	317 (99.06)	3 (0.94)	0(0.00)
Uses of hand sanitizers guided by WHO	316 (98.75)	4 (1.25)	0(0.00)
Environmental cleaning by disinfecting agents	311 (97.19)	9 (2.81)	0(0.00)
Proper waste management in hospital	228 (71.25)	81 (25.31)	11(3.44)

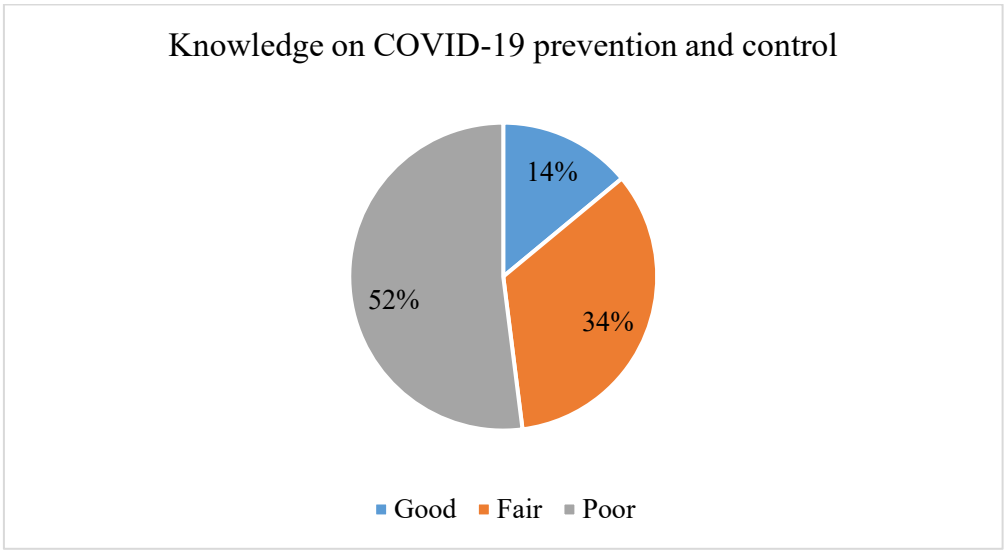

Figure 2: Distribution of the respondents according to knowledge on COVID-19 prevention and control

Table 8: Distribution of the respondents according to association between educational qualification and level of knowledge on prevention and control of COVID-19

Educational qualification	Level of Knowledge on prevention and control of COVID-19			Total	Value
	Poor	Fair	Good		
Diploma in Nursing science & midwifery	39	88	150	277	$\chi2$ = 8.470 p = .076
Bachelor of science in Nursing / Public Health Nursing	5	12	13	30	
Masters in Nursing / Public Health	3	8	2	13	
Total	**47**	**108**	**165**	**320**	

Table 9: Distribution of the respondents according to association between work experiences (in complete years) and level of knowledge on prevention and control of COVID-19

Work experiences	Level of Knowledge on prevention and control of COVID-19			Total	Value
	Poor	Fair	Good		
Less than 5	21	47	104	172	$\chi2$ = 23.060 p = .003
5-10	11	23	32	66	
11-15	6	7	7	20	
16-20	4	18	6	28	
More than 20	5	13	16	34	
Total	**47**	**108**	**165**	**320**	

DISCUSSION

Corona virus disease is a highly contagious disease affecting all population in all ages with high infection transmission rates. Nurses, being frontline healthcare providers, played a crucial role in managing infected patients and preventing the spread of the virus. Their knowledge about the disease's transmission, symptoms, treatment, and infection control was vital for effective clinical response. This study aimed to assess the knowledge of nurses working in a tertiary-level hospital in Bangladesh regarding COVID-19 management and to compare their responses with findings from international studies. In the present study, the majority of nurses (42.2%) were aged 30–39 years. Similarly, Saha *et al.,* (2020) reported that 24.7% of respondents were aged 25–35 years, 45.3% were 36–45, and 30.0% were 46–55 years [13]. Our study revealed that 93.1% of nurses were female, aligning with Saha *et al.,* (2020), who reported 83.4% female nurses in Bangladesh [13]. This gender disparity reflects cultural norms and government policies limiting male nursing admissions to 5%. Additionally, UN Women (2020) highlights women's greater confidence and awareness regarding COVID-19 impacts. In this study, most nurses held a Diploma in Nursing Science & Midwifery (86.6%), with 9.4% having a BSc in Nursing and 4.1% possessing an MSN/MPH. Similarly, Saha et al. (2020) reported 56.3% diploma, 31.1% BSc, and 12.6% MSc/MPH qualifications, reflecting Bangladesh's emphasis on diploma training [13]. The majority were Muslim (70.5%), consistent with national demographics and prior findings [13]. Over half (53.8%) had under five years' experience, likely due to recruitment of younger nurses amid COVID-19. Additionally, 85.3% were married, which may enhance preventive behaviors through social support, reducing infection risk [15-16]. Before the COVID-19 pandemic, nurses in Bangladesh typically worked 6-hour shifts without night duties. Our study found that 95.9% of nurses now work 8-hour shifts daily, likely due to increased patient load, expanded clinical demands, and staffing shortages. Prolonged working hours, especially over 12 hours, have been linked to fatigue, burnout, and compromised patient care quality [17]. Extended shifts also increase stress and anxiety, reducing care effectiveness [18]. Additionally, continuous PPE use during long shifts exacerbates physical strain, heightening the risk of errors [19]. Nursing management must optimize staffing to protect nurses' physical and mental health. Our study demonstrated that nurses have a strong understanding of both general COVID-19 knowledge and management practices. Similarly, a cross-sectional study in Cyprus reported high levels of knowledge and awareness among healthcare workers during the pandemic [20]. Consistent with this, Saha *et al.,* (2020) found that 73.42% of nurses exhibited good knowledge regarding COVID-19 prevention and control [13]. Additionally, Aydin and Balci (2020) observed that nurses at Afyonkarahisar Health Sciences University possessed sufficient knowledge and a heightened sensitivity to preventive measures, emphasizing that knowledge is crucial in controlling infectious diseases [21]. The present study revealed that nurses demonstrated fair knowledge regarding the management of COVID-19 patients. As COVID-19 is a novel disease caused by SARS-CoV-2, and with no definitive treatment available, nurses play a pivotal role in delivering safe, high-quality supportive care. Their responsibilities span from initial patient assessment, triage, sample collection, and symptomatic treatment—including antipyretics, antibiotics, and oxygen therapy—to patient education and infection prevention. Management of critically ill patients involves more advanced interventions such as mechanical ventilation, vasopressors, fluid resuscitation, and nutritional support, requiring specialized nursing competencies. Despite these crucial responsibilities, our findings indicate that many nurses lacked formal training on COVID-19

management, which may explain the moderate level of knowledge observed. However, knowledge related to prevention and control was found to be satisfactory. Our cohort's fair overall knowledge contrasts with the robust understanding reported by Jin *et al.,* (2020) in China, where nurses scored above 60% in areas such as case reporting and hand hygiene but fell below 30% in transmission routes and PPE usage [22]. Our study identified a significant association between nurses' work experience and their level of knowledge regarding the prevention and control of COVID-19. Similarly, age was also significantly related to knowledge levels. Nurses with 11 to 20 years of experience demonstrated more favorable attitudes and a deeper understanding compared to those with less experience. Greater work experience appears to enhance critical thinking, clinical judgment, and preparedness in managing COVID-19 patients. It fosters increased awareness, refined preventive skills, and higher-quality care. These findings support the idea that experience shapes knowledge, attitudes, and practices, ultimately improving patient outcomes and reinforcing strong nursing performance [23].

Limitations of the study:

The present study has certain limitations that should be considered when interpreting the findings. As a descriptive cross-sectional study conducted in the COVID-19 dedicated unit of Faridpur Medical College Hospital, the results reflect the knowledge status of nurses within a single institution and may not be generalizable to all tertiary-level hospitals in Bangladesh. The use of a non-probability convenience sampling technique introduces the possibility of selection bias, which may affect the representativeness of the sample. Moreover, the unique challenges posed by the COVID-19 pandemic—such as increased workload, emotional stress, and safety concerns—may have influenced participant responses, thereby affecting the study's internal and external validity.

CONCLUSION AND RECOMMENDATIONS

The rapid spread of COVID-19 remains a major public health threat, with frontline nurses playing a vital role in patient care, prevention, and infection control. This study demonstrated that nurses working in a tertiary-level hospital possess satisfactory knowledge regarding COVID-19 patient management. However, continuous improvement is essential. Nurses must adhere strictly to infection prevention protocols, enhance their understanding of COVID-19 management strategies, and practice appropriate personal protective measures to reduce occupational exposure.

Recommendations:

- Regular and updated training programs should be implemented to strengthen nurses' knowledge and skills.
- Psychological support services must be provided to address mental stress and prevent burnout among nursing staff. These measures will improve the quality of care and ensure better protection for both healthcare providers and patients.

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Ethical Approval: The study was approved by the Institutional Ethics Committee.

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