

## Nurses' Knowledge and Practices Regarding Prevention and Control of COVID-19 Infection in a Tertiary Level Hospital

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### Abstract

**Background:** Bangladesh is a highly populated country for that reason COVID-19 is highly transmittable infection in Bangladesh. **Objective:** The aim of this study was to identify the nurses' knowledge and practices regarding prevention and control of COVID-19 infection. **Methodology:** This cross-sectional study was conducted in Rajshahi Medical College Hospital, Rajshahi, Bangladesh from April to July 2020. The questionnaires were completed and returned by the nurses. Collected data were checked, coded and transferred in to SPSS version 25 for analysis. Frequency, percentage, mean, SD, chi-square and other statistics were calculated. **Result:** The knowledge and practices scores were categorized into good ( $\geq 80\%$ ), fair (59-79%), and poor. The result shows that majority of the respondents 83.4% were female and 16.6% were male. Only 8.68% took training on COVID-19. More than half of the respondents (52.11%) took information from social media and 7.89% from seminars and workshops. Nearly two third percent nurse's possessed (73.42%) good knowledge about COVID-19 and 17.63% had fair knowledge. 73.42% nurses had good practices, 21.84% fair practices and 8.68% poor practices. There is a significant relationship between Nurses' knowledge and practices ( $p=0.01$ ). **Conclusion:** In conclusion effective and appropriate health education and training programs improve COVID-19 knowledge and maintenance of safe practices. Safe practices lead to prevent spread of COVID-19 infection from patient to nurses and nurse to patient. [Bangladesh Journal of Infectious Diseases, October 2020;7(suppl\_2):S27-S33]

**Keywords:** Knowledge; practices; prevention and control; COVID-19 infection; nurse's; tertiary level hospital

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## Introduction

Since December 2019, the novel coronavirus disease (COVID-19) has spread from Wuhan city to other cities in China and around the world<sup>1</sup>. On March 11, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic. As of March 15, 2020, there had been 81,058 confirmed cases and 3204 deaths due to the virus in China. According to the WHO, the outbreak of coronavirus disease 2019 (COVID-19) has become a pandemic<sup>2</sup>. Amidst to current pandemic, WHO has issued several guidelines and also started online courses and training sessions to raise awareness and preparedness regarding prevention and control of COVID-19 among HCPs<sup>3</sup>. Knowledge and practice survey provides a suitable format to evaluate existing programs and to identify effective strategies for behaviour change in society<sup>4</sup>. Currently, there is scarce information regarding the awareness level of HCPs in Pakistan, Therefore, the present study aimed to identify the current status of knowledge and practices regarding COVID-19 among healthcare professionals in Bangladesh. Study will highlight the information sources utilized and training in infection control perceived by Nurses.

In December 2019, a rapidly infectious disease emerged in Wuhan city in China. The disease was caused by a member of the family of coronaviruses, finally named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The highly contagious virus, which caused the disease called coronavirus disease (COVID-19), spread outside China and has since become a global public health emergency<sup>5</sup>. In severe cases, the virus causes fatal pneumonia similar to that caused by severe acute respiratory syndrome coronavirus (SARS-CoV), and Middle East respiratory syndrome coronavirus (MERS-CoV), which have emerged in the past 20 years in sporadic countries all over the world<sup>6</sup>.

The clinical symptoms of COVID-19 include fever, which is the most common symptom, cough, fatigue, malaise, and shortness of breath. Global concerns about the virus have risen due to its high transmission capability, which may be coupled with morbidity and mortality<sup>7</sup>. The elderly and patients with comorbidities are more likely to be infected and are additionally more prone to serious complications, which may be associated with acute respiratory distress syndrome (ARDS) and cytokine storm<sup>8</sup>.

COVID-19 transmits from person to person by droplets when an infected person sneezes and by

direct contact and virus has an incubation period of 4-14 days<sup>9</sup>. Elderly and patients who suffered with chronic medical conditions like diabetes and cardiovascular diseases are more likely to get severe infection<sup>10</sup>. Till the moment, there is no proved treatment or vaccination against SARS-CoV-2. Strong infection control measures are the primary intervention to minimize the spread of the virus in both health care settings and the community<sup>11</sup>. Vaccine development is estimated to require months, and thus management of the crisis depends primarily on people's adherence to the recommended measures taken. These measures are largely affected by knowledge, attitudes, and practices (KAP) of the public<sup>12</sup>.

In China, lessons learned from the SARS outbreak in 2003 suggest that knowledge and attitudes towards infectious diseases are associated with the level of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease<sup>13</sup>. Behaviour's like underestimation, stigmatization, panic emotions, and false measures to avoid infection affect the battle against such an uncommon situation<sup>7</sup>.

In Bangladesh, the first case identified since 8 march. After one month the covid-19 patients gradually increasing daily average thousand. Bangladesh is a highly populated country here is chance for spread the infection rapidly. If the infection does not stop Bangladesh may disable to fight against covid-19. Nurses has an effective role to prevention and control the covid-19 infection. All nursing and midwifery staff are fundamental to informing the public and reassuring them about the COVID-19 outbreak<sup>14</sup>. The aim of this study was to identify the nurses' knowledge and practices regarding prevention and control of COVID-19 infection.

## Methodology

This cross-sectional study was carried out for this investigation. The study was conducted in Rajshahi Medical College Hospital (RMCH), and it's a Governmental Tertiary Level Hospital. Total study period was 4 months from 1 April to 31 July 2020. Nurses of the Rajshahi Medical College Hospital (RMCH), was the study populations who give direct care to the patient. Purposive sampling technique was used. A survey instrument was designed based on extensive literature review and WHO infection prevention and control guidelines regarding COVID-19. After an initial draft of the questionnaire designed, it was validated in 2 steps. Firstly, the study instrument was sent to researchers

and professionals from medical background to give their expert opinion with respect to its simplicity, relativity and importance. Secondly, a pilot study was conducted by selecting a small sample of Nurses (n = 40) who gave their opinions on making the questionnaire simpler and shorter. Amendments from the participants were considered and integrated into the questionnaire, while ensuring its consistency with the published literature. After a thorough discussion, questionnaire was finalized by the authors and subsequently distributed to the participants for their response. The data of the pilot study was not used for the final analysis. The questionnaire was consisted of questions assessing demographics, information source, knowledge and practices toward COVID-19. Demographic characteristics included were Age, Gender, Religion, Educational qualification Length of service, and one item regarding Training on COVID-19. Source of Information regarding COVID-19. It's included Social Media, Radio & television, Seminars & workshops, Posters & Pamphlets, Newspapers & Magazines, Seniors & Other Colleagues and Online education. Knowledge section comprised of 10 items; regarding nature of disease (1-item), transmission (1-item), symptoms (1-item), Isolation(1-item), Vaccine(1-item), treatment(1-item), preventions (1-item) higher risk(2-items) and fatal (1-item). Seven questions were responded as one correct answer, one wrong answer and one don't know. Three questions were yes, No and don't know. The correct answer was marked as 1 while wrong answer and don't know was marked as 0. Total score ranges from 0-10 and it was then converted into percentage. A cut off level of ( $\leq 50\%$ ) was set for poor knowledge (51-80%) fair knowledge and ( $\geq 80\%$ ) for good knowledge<sup>15</sup>. Practice section included 19 items questions according to WHO infection prevention and control guidelines regarding COVID-19. Each item was responded as one correct answer, one wrong answer and one don't know. The correct answer was marked as 1 while wrong answer and don't know was marked as 0. Practice items total score ranged as 0-19, and a score of and ( $\geq 80\%$ ) demonstrated good practice, (59-79%) demonstrated fair practices and a score of ( $\leq 59\%$ ) indicates poor practice toward COVID-19<sup>15</sup>. Written informed consent will be obtained from each respondent after explaining the purpose and procedure of the study with maintaining their full autonomy. Subjects' autonomy and confidentiality was strictly maintained. A permission letter taken from the director of Rajshahi Medical College Hospital. The researcher communicated with the Nursing Superintendent to select the eligible subjects to participate and informed the subjects

about the objectives and the procedure of this study. Participation was voluntary and anonymity was guaranteed. Based on returning and completing the questionnaire by 384 nurses' considered as eligible subjects who signed written informed consent form and completed questionnaire in this study. Subjects could be withdrawn at any time without any reason. Manually and descriptive statistics calculated by using SPSS v.25.

## Results

This descriptive cross-sectional study was carried out among 380 Nurses who were directly related to patient care working in Rajshahi Medical College Hospital, Rajshahi, Bangladesh.

**Table 1: Demographic Characteristics of Respondents (n=380)**

Attributes	Frequency	Percent
<b>Age (years)</b>		
25 – 35	94	24.7
36 – 45	172	45.3
46 – 55	114	30
<b>Gender</b>		
Male	63	16.6
Female	317	83.4
<b>Religion</b>		
Hindu	64	16.57
Muslim	291	76.57
Buddhist	06	1.57
Christian	19	05
<b>Educational qualification</b>		
Diploma in Nursing	214	56.3
BSc in Nursing	118	31.1
MSc in Nursing/ MPH	48	12.6
<b>Length of service (years)</b>		
01 - 05	182	47.9
06 – 10	153	40.3
Above 10	45	11.8
<b>Training on COVID-19</b>		
Yes	33	8.68
No	347	91.31

From the respondents 24.7% were from 25 – 35 years age group 45.3% from 36 – 45 years age group and rest of them 30.0% from 46 – 55 years. Majority of the respondents 83.4% were female and rest of them 16.6% were male. Among the respondents 76.57% were Muslim, 16.57% Hinduism, 05% Christian and 1.57% Buddhist. Educational qualification of the respondents were 56.3% diploma in nursing 31.1 BSc in nursing

among them 12.6% had educational level up to MSc in Nursing/ MPH and almost half of the respondents 47.9% had length of service within 01 - 05 years, 40.3% had from 06 -10 years and rest of them 11.8 respondents had 10 years above. Training on COVID-19 Only 8.68% took training (Table 1).

Figure II shows the number and frequency of nurses who were in each category of knowledge level. It was found that 73.42% of Nurses possessed Good Knowledge 17.63% Nurses possessed Fair knowledge and rest of them 8.95% possessed Poor Knowledge regarding Prevention and Control of COVID-19 Infection.

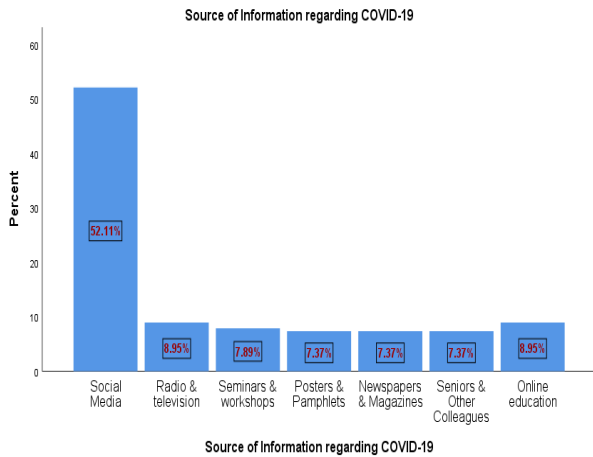


Figure I: Source of Information regarding COVID-19

Figure I shows above half of the respondents 52.11% took information from social media, 8.95% from radio & television 7.89% from seminars & workshops, posters & pamphlets, from newspapers & magazines and from seniors & other colleagues 7.37% among them 8.95% from Online education

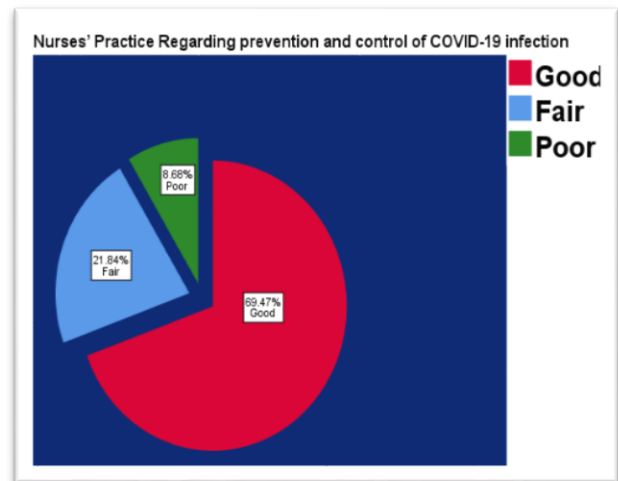


Figure III: Nurses' Practice Regarding prevention and control of COVID-19 infection (n= 380)

It was found that 8.68% nurses scored poor practices, nurses 21.84% scored fair practices and rest of them scored good practices (Figure III).

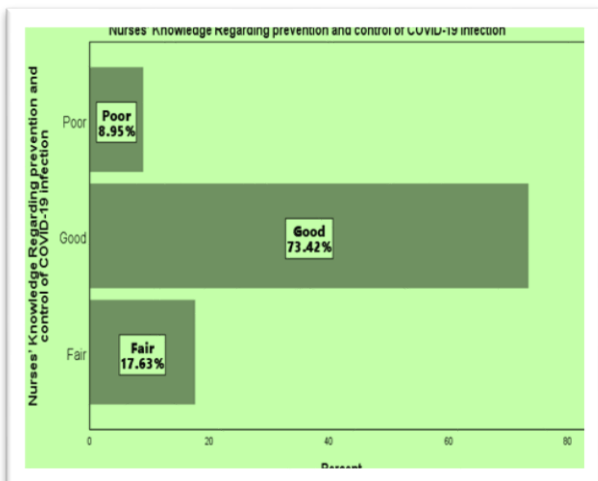


Figure II: Nurses' Knowledge Regarding prevention and control of COVID-19 infection (n= 380)

Table 2a: Frequency of Overall Knowledge and Practices Level of Nurse's according to Age, Gender, Education and Length of Services Regarding Prevention And Control of COVID-19 Infection (n= 380)

Attributes	Frequency	Percent
<b>Age Group</b>		
25 to 35 Years	94	24.7
36 to 45 Years	172	45.3
46 to 55 Years	114	30
<b>Gender</b>		
Male	63	16.6
Female	317	83.4
<b>Educational Qualification</b>		
Diploma in Nursing	214	56.3
BSc in Nursing	118	31.1
MSc in Nursing/ MPH	48	12.6
<b>Length of Services</b>		
1 to 5 Years	182	47.9
6 to 10 Years	153	40.3
Above 10 Years	45	11.8

**Table 2b: Frequency of Overall Knowledge and Practices Level of Nurse's according to Age, Gender, Education and Length of Services Regarding Prevention And Control of COVID-19 Infection (n= 380)**

Attributes	Knowledge Level	Practices Level
<b>Age Group</b>		
25 to 35 Years	Fair	Fair
36 to 45 Years	Good	Good
46 to 55 Years	Good	Good
<b>Gender</b>		
Male	Good	Good
Female	Good	Fair
<b>Educational Qualification</b>		
Diploma in Nursing	Good	Good
BSc in Nursing	Fair	Poor
MSc in Nursing/ MPH	Good	Good
<b>Length of Services</b>		
1 to 5 Years	Good	Good
6 to 10 Years	Good	Good
Above 10 Years	Poor	Fair

In this study 94 nurses were in the age group of 25 to 35 years and they scored fair knowledge and fair practice, 172 nurses' age in 36 to 45 years and they scored good knowledge and good practice and 114 nurses' age in 46 to 55 years and they scored good knowledge and good practice. Male were 63 cases and they scored good knowledge and good practices; however, female were 317 and they scored good knowledge and fair practices. Educational level of 214 nurses were diploma in nursing and they scored good knowledge and good practices, BSc in nursing was in 118 nurses and they fair knowledge and poor practices and MSc in nursing or MPH 48 nurses and they scored good knowledge and good practices. Length of services 1 to 5 years 182 nurses and they scored good knowledge and good practices, length of services 6 to 10 years 153 Nurses and they scored Good knowledge and Good practices and 45 Nurses above 10 years length of services and they scored poor knowledge and fair practices (Table 2a&b).

## Discussion

COVID-19 infection now is a common problem all over the world. Therefore, up to date knowledge and nursing skills can play important roles in COVID-19 infection control. Nurses should have the opportunity to practice infection control on a day-to-day basis as an integral part of patients' care. That is why the current study was carried out. In

our study that was conducted at Rajshahi Medical College Hospital, revealed from the current study, nearly two thirds of the studied sample aged between 25 to 45 years old. This finding is in concordance with that of emphasizing the need to protect this group of workers in the prime of their life from hospital infections<sup>16-18</sup>.

**Table 3: Pearson Product-Moment Correlation Coefficients between Nurses' Knowledge and Practice Regarding Prevention and Control of COVID-19 Infection (n= 380)**

Pearson Correlation	1	0.908**
P value		0.000
N	380	380

Findings of current survey demonstrated that majority of Nurse's have good knowledge (73.42%), and good practice (69.47%) towards COVID-19. Of note that, 52.11% Nurse's utilized social media as a main source of information while only 7.89% seek information from seminars & workshops. Findings are consistent with number of studies as Giao et al<sup>20</sup> reported social media as a main source of information regarding COVID-19 used by 91.1% participant health care workers<sup>19</sup>. Similarly, a study conducted among 453 HCPs found that more than 61.0% respondents use social media to seek information regarding COVID-19.

This is important as in this global pandemic, there is also a pandemic of misinformation regarding COVID-19; a serious concern might lead to xenophobia in the world as already warned by scientists and WHO officials<sup>21</sup>. Also, there is plethora of malicious and unverified information waved on internet that spread quickly and could misguide the HCPs. So, situation demands that HCPs should carefully evaluate COVID-19 information sources and utilize authentic and valid content to seek information<sup>22</sup>.

Current findings of good knowledge among HCPs is in line with findings of Giao et al<sup>23</sup> who reported that 88.4% participants have sufficient knowledge regarding COVID-19. Nemati et al<sup>24</sup> also reported that 89.51% healthcare workers have claimed good knowledge while in another study conducted among nurses reported that 56.5% respondents have sufficient knowledge regarding transmission, symptoms and treatment of COVID-19. Present findings provide confidence in terms of healthcare professional's knowledge regarding COVID-19 symptoms, transmission and preventive measures.

This is of more significance in current scenario when there is no vaccine and research is ongoing so Nurse's must aware of all the updates and take precautions in treating and preventing the infection.

Results revealed that majority of Nurse's have good practice in following precautionary measures. Highest good practice was observed in washing hands with soap which is similar to the findings of Khan et al<sup>25</sup> and Nour et al<sup>26</sup> who reported 95.4% and 85.7% HCPs used to wash their hands continuously.

Findings demonstrated that majority of Nurses perceived that limited infection control material and lack of knowledge regarding transmission of COVID-19 are the major barriers in infection control practice. Correlational analysis findings of present study as knowledge is significantly related to good practices.

The study has number of implicit limitations. Firstly, it is a cross-sectional study conducted during lockdown period, and institutional review board was not approached. Secondly, this survey responses mainly depend upon honesty and partly affected by recall ability and thus may subject to recall bias. Potential sample clustering might also limit the generalizability of study.

## Conclusion

These findings suggest the need for effective and appropriate health education programs aimed at improving COVID-19 knowledge, thereby leading to implementation and maintenance of safe practices. Safe practices lead to prevent risk of spread of COVID-19 infection from patient to nurses and nurse to patient. MOHFW, Bangladesh should provide a comprehensive training programme, targeting all Nurse's to promote all precautionary and preventive measures of COVID-19, to achieve equilibrium in terms of clinical knowledge about COVID-19.

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