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Knowledge, Attitude, and Practice towards Handling Covid-19 among Nurses in a Teaching Hospital

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Abstract
A new coronavirus was discovered in China that causes serious respiratory diseases. Nurses play an important role in handling patients with COVID-19. This study aims to assess the level of knowledge, attitude, and practice towards handling COVID-19 among nurses. A descriptive cross-sectional study was done, with questionnaires on nurses' knowledge, attitude, and practice regarding handling COVID-19. The majority of nurses (99.2%) have good knowledge, while 39.0% had a positive attitude, and 65.9% of nurses had good practice in handling patients with COVID-19. There is a significant relationship with weak correlation between attitude and practice (p= 0.024, r= 0.204).

Keywords: Knowledge, attitude, practice, COVID-19.

1.0 Introduction
COVID-19 is an irresistible infection caused by a recently found strain of coronavirus called SARS- CoV-2, a sort of infection known to cause respiratory diseases (WHO, 2020). In March 2020, a devout occasion occurred at Sri Petaling, Kuala Lumpur, which led to an exponential rise in cases (Barker, 2020). Ministry of Health Malaysia (MOH) (2020) reported that 28,512 HCWs were screened, and 363 were confirmed positive for COVID-19. In the latest update, over 600 healthcare workers in Malaysia have been affected by COVID-19 since February.

Healthcare workers (HCWs) are at risk of infection within the epidemic chain, which might be a severe problem because HCWs helped control the flare-up. This includes all professionals and support staff at risk of contracting COVID-19 because of their job. Around 50,000 healthcare professionals had been infected globally, accounting for 20% of all recorded cases, and 70 had died (Antonio, 2020). COVID-19 has posed severe occupational health risks to healthcare workers due to frequent exposure to infected individuals. Zhang et al. (2020) stated that nurses' 37.85% had lower knowledge about COVID-19 than the doctors' 38.56%. However, more than 74% of respondents have good practices in preventing COVID-19 (Olum et al., 2020; Alzoubi et al., 2020; Giao et al., 2020; Zhang et al., 202). Still, in some conditions, HCWs should place a high value on the correct removal technique of protective equipment to prevent further contamination and infection. Therefore, assessing nurses' knowledge, attitude, and practices is necessary to make adequate plans related to their preparedness (Cervera-Gasch et al., 2020). Thus, this study was done to assess the level of knowledge, attitude, and practice towards handling COVID-19 among nurses in a teaching hospital.

2.0 Literature Review

COVID-19 is a worldwide Coronavirus outbreak. Coronaviruses primarily cause enzootic infections in mammals and birds, but now, they have been able to infect human beings (Giao et al., 2020). According to the CDC (2020), most patients (80%) have mild symptoms that do not require medical interventions. However, about 20% of COVID-19 cases had a severe illness such as dyspnea, sepsis, septic shock, and organ failure, and it can be fatal in about 2% of cases. In terms of transmission, WHO has stated that touching contaminated droplets on surfaces or objects or close contact with an infected person within one meter, can facilitate transmission between humans (Giao et al.,2020).

According to Maurya et al. (2020), respondents in the nursing profession have the highest level of knowledge compared to other healthcare workers. However, Salman et al. (2020) found that 75.5% of respondents had good knowledge of COVID-19, where the doctors were found to have better knowledge scores than the other health professionals. According to Wahed et al. (2020), most respondents thought COVID-19 was a severe condition and could be prevented. Most HCWs (95.6%) thought that infection management is a good way to defend against COVID-19, with allied health care professionals having a more significant percentage than physicians.

Salman et al. (2020) report that most health professionals (86.5%) have positive attitudes toward COVID-19. There was a statistical difference in attitude scores among age, gender, and the respondent categories. A positive attitude towards COVID-19 infection was shown by most of the respondents agreeing that COVID-19 can be transmitted by coughing and sneezing. However, age and profession affect the result (Hussain et al., 2020).

The majority of the HCWs are following infection prevention and control practices recommended by the Ministry of Health and WHO, such as regular hand hygiene, social distancing, and wearing a face mask when in high-risk situations (Olum et al., 2020). However, 60% of HCWs admitted having avoided patients with symptoms suggestive of COVID-19 due to a shortage of personal protective equipment (Olum et al., 2020). Good knowledge, a positive attitude, and good practice regarding precautionary measures such as donning gloves, protective gowns, goggles, and a facemask are essential for HCWs (Saqlain et al., 2020). The disease's ongoing pandemic necessitated HCWs to take extra measures because of the critical circumstances, putting up an effort to implement proper hygienic conditions and adhering to recommendations. Mass media plays an essential role in delivering messages and information about COVID-19. Otherwise, the relationships between knowledge, attitude, and practices have shown no significant differences in almost all the studies (Alzourbi et al., 2020; Olum et al., 2020; Hussain et al., 2020 & Salman et al., 2020).

3.0 Methodology

3.1 Study design
This study was a cross-sectional conducted among nurses at the University of Malaya Medical Centre (UMMC).

3.2 Sample
Purposive sampling was used for this study, with a sample size of 123. The inclusion criteria for this study were the respondents working in the emergency department and infectious disease (ID) ward at UMMC and handling COVID-19 cases. The exclusion criteria of this study were respondents who were on leave and had already participated in the pilot study.

3.3 Instruments
3.3.1 Knowledge of COVID-19
This question was adapted from Hussain et al. (2020) and consisted of 13 questionnaires with a three-point trichotomous question design (yes, no, and I don't know), which is indicated as 1 point for yes, 0 for no, and for I don't know. The scoring point ranged from 0 to 13. A mean knowledge score ≥ 10 was recorded as good knowledge, while a score below ten was recorded as poor knowledge. A pilot study was conducted to test the validity and reliability of the questionnaire.

3.3.2 Attitude towards COVID-19
The questionnaire was adapted from Hussain et al. (2020) and consists of 11 questions recorded on trichotomous (disagree = 3 points, neutral=2 points, and agreed=1 point). These questions in this section evaluated the attitude of respondents towards COVID-19. A score of less than or equal to 11 indicates a positive attitude toward handling COVID-19, while scoring more than 11 was recorded as a negative attitude toward managing COVID-19.

3.3.3 Practice towards COVID-19
The questionnaire was adapted from Hussain et al. (2020) and consisted of 9 questions recorded on a categorical scale (often, sometimes, and never based). The questions in this section measured the respondent's preventive practices regarding COVID-19. A score of equal to or less than 8 indicates the good preventive approach to handling COVID- 19, while scoring score greater than eight was recorded as the poor preventive practice of
handling COVID-19.

3.3.4 Validity and Reliability for Knowledge, Attitude and practice towards COVID-19 questionnaire.
The questionnaires were converted into the local language, namely Malay, to certify that the questions would be fully understood

by respondents. Regarding content validity, experts in Malay and English performed forward and backward translations. The questionnaire was proofread and translated by the linguistic department. The experts checked the content: two internal medicine specialists, one nursing lecturer, one nurse, and one infection control nurse. After that, the questionnaires were then checked once again by the experts. The harmonization of the translation is done. Five respondents were involved in face validation. The pilot study was done before the actual study had been conducted. Twelve respondents were selected for this pilot study. The Cronbach's alpha obtained were; Knowledge towards COVID-19 α = 0.743, attitude towards COVID-19 α = 0.730, and practice towards COVID-19 α = 0.708.

3.4 Procedures
The data was collected after approval from the UiTM Research Ethics Committee [REC/03/2021(MR/115)] and UMMC Medical Research Ethics Committee [MREC ID NO:20201230-9646]. After obtaining permission from the head of the nursing department, the researcher approached the ward manager and explained the study. The ward manager helped gather the respondents into short meetings to distribute the questionnaires. Before distributing research instruments, a brief explanation of the research was given, and informed consent was acquired. The respondents were approached and informed that they had the right to refuse to participate in this study. The respondents answered the questionnaires within 20 to 30 minutes, and the questionnaire was collected immediately by the researcher.

3.5 Data Analysis
Data were analyzed using SPSS version 25.0. Descriptive statistics were used to determine the knowledge, attitudes, and practice of COVID-19 among nurses in UMMC. The correlation coefficient test was used to determine the relationship between knowledge, attitudes, and practice toward COVID-19 among nurses in UMMC. A significant level was set at 0.05.

4.0 Result

4.1 Demographic data

Table 1. Demographic data of respondents (n=123)

Variables	Categories	N (%)
Age	20-25	28 (22.8)
	26-30	64 (52.0)
	31-35	29 (23.6)
	36-40	2 (1.6)
Gender	Male	33 (26.8)
	Female	90 (73.2)
Education	Diploma	79 (64.2)
	Advance	35 (28.5)
	Degree	9 (7.3)
Marital status	Married	65 (52.8)
	Unmarried	58 (47.2)
Year of services	1-5	31 (25.2)
	6-10	62 (50.4)
	11-15	27 (22.0)
	16-20>	3 (2.4)
Unit	Emergency	55 (44.7)
	ID	68 (55.3)

Table 1. shows the demographic data of nurses who participated in this study. Most of the respondents were between 26-30 years old. Most of them were female nurses (73.2%, n=90), have diploma qualifications (64.2%, n=79), and from the infectious diseases ward (55.3%,n=68).

4.2 Knowledge about handling COVID-19 among nurses in UMMC

Table 2. Knowledge towards handling COVID-19 among nurses in UMMC (n=123).

Items	Frequency (%)		
	Yes	No	I don't know
1. Have you ever heard about the novel coronavirus and the related terms COVID-19 or 2019-nCoV?	116 (94.3)	3(2.4)	4 (3.3)
2. COVID-19 disease is a viral infection	122 (99.2)	1(0.8)	0 (0)
3. Fever, sore throat, cough, and shortness of breath are possible symptoms of COVID-19 infection	123 (100)	0 (0)	0 (0)
4. The novel coronavirus is a similar virus as SARS-CoV and MERS-CoV	107 (87.0)	13(10.6)	3 (2.4)
5. Is the COVID-19 infection the same illness as flu or cold?	95 (77.2)	22(17.9)	6 (4.9)
6. Is there any laboratory test to confirm the presence of COVID-19	123 (100)	0 (0)	0 (0)

infection?			
7. The incubation period of COVID-19 infection is 1–2 weeks?	121 (98.4)	2(1.6)	0 (0)
8. Can COVID-19 infection be caught from a person who presents no symptoms and has recently visited the affected area?	122 (99.2)	0 (0)	1 (0.8)
9. People with a compromised immune system and old age people are at more risk of developing the infection?	123 (100)	0 (0)	0 (0)
10. Patients with comorbidities are at more risk of developing the infection	115 (93.5)	7(5.7)	1 (0.8)
11. Health care workers and hospitalized patients who are near to infected patients are at more risk of developing the infection	120 (97.6)	3(2.4)	0 (0)
12. People in crowded places are at increased risk of getting affected by the disease	123 (100)	0 (0)	0 (0)
13. Patients of COVID-19 infection should be immediately isolated to avoid the transfer of infection to other people	123 (100)	0 (0)	0 (0)
Total Score, Mean (SD)		**13.46(0.81)**	

Table 2 shows the knowledge of handling COVID-19 patients among nurses. The majority of respondents, n=122 (99.2%), knew that COVID-19 disease is a viral infection. However, only 95 (77.2%) of the respondents answer yes to the question, "is the COVID-19 infection the same illness as flu or cold?".

4.3 Attitude towards handling COVID-19 among nurses

Table 3. Attitude towards handling COVID -19 among nurses in UMMC (n=123).

Items	Frequency (%)		
	Agree	Neutral	Disagree
1. The disease can be transmitted by coughing and sneezing	123 (100)	0 (0)	0 (0)
2. Transmission of COVID-19 infection can be prevented through wearing masks	123 (100)	0 (0)	0 (0)
3. Transmission of COVID-19 infection can be prevented through washing hands and face regularly with antiseptics and sanitizers	114 (92.7)	6(4.9)	3(2.4)
4. Transmission of COVID-19 infection can be prevented through the isolation of COVID-19 infected patients	120 (97.6)	3(2.4)	0 (0)
5. Transmission of COVID-19 infection can be prevented by taking antibiotics	77 (62.6)	29(23.6)	17(13.8)
6. Restricting the travel of COVID-19 infected people to other areas of the world and of people in other areas to affected areas can be beneficial to prevent the spread of the infection	114 (92.7)	7(5.7)	2(1.6)
7. Avoiding touching nose, mouth and eyes can reduce the risk of infection	112 (91.1)	11 (8.9)	0 (0)
8. Avoiding touching the surface of doors, furniture or other things can be helpful in preventing the disease	93 (75.6)	29(23.6)	1(0.8)
9. If a vaccine is developed against the novel coronavirus, it can significantly reduce the epidemic spread	113 (91.9)	10 (8.1)	0 (0)
10. The available information about COVID-19 disease is sufficient in Malaysian society	102 (82.9)	15(12.2)	6(4.9)
Total Score, Mean (SD)		**12.53 (1.76)**	

Table 3 shows the descriptive analysis of the results for attitude towards handling COVID-19 among nurses. All respondents (100%) knew that the disease could be transmitted by coughing, and they needed to wear a mask to prevent it. While only 62.6% (n=77) of the respondents agree with questions on "transmission of COVID-19 infection can be prevented by taking antibiotics". Only 75.6% (n=93) of the respondents agree that "avoiding touching the surface of doors, furniture or other things can help prevent the disease".

4.4 Practice towards handling COVID-19 among nurses

Table 4. Practice towards handling COVID -19 among nurses in UMMC (n=123).

Items	Frequency (%)		
	Often	Sometimes	Never
1. I eat thoroughly cooked food especially meat products	102 (82.9)	20 (16.3)	1 (0.8)
2. I am keeping myself warm and hydrated	93 (75.6)	26 (21.1)	4 (3.3)
3. I am using soap or sanitizer to wash my hands and face	113 (91.9)	9 (7.3)	1 (0.8)
4. I am avoiding close contact with people having cough and flu-like symptoms	111 (90.2)	12 (9.8)	0 (0)
5. During interaction with the Covid-19 patient, I wear the necessary personal protective equipment such as masks, gloves and gown etc	115 (93.5)	8 (6.5)	0 (0)
6. I perform hand hygiene before and after touching the Covid-19 patients or before and after performing an aseptic procedure	123 (100)	0 (0)	0 (0)
7. I perform hand hygiene after touching the patient's surroundings like beds, tables, doors etc	121 (98.4)	2 (1.6)	0 (0)
8. I avoid unnecessary close contact and practice social distancing and keep at	108 (87.8)	15 (12.2)	0 (0)

least 1-m distance from patients and other healthcare workers			
9. The government in our country has all the necessary healthcare facilities and are able to control the epidemic situation	105 (85.4)	16 (13.0)	2 (1.6)
Total Score, Mean (SD)		8.84 (1.37)	

Table 4 shows a descriptive analysis of the results for practice towards handling COVID-19 among nurses. Most respondents wash their hands using soap and sanitizer (n=113, 91.9%). All respondents (n= 123, 100%) practiced hand hygiene before and after touching the COVID-19 patients or before and after performing an aseptic procedure. While only 75.6% (n=93) of the respondents answer often for questions, "I am keeping myself warm and hydrated".

4.5 Level of knowledge, attitude, and practice towards COVID-19

Table 5. Knowledge, attitude, and practice level towards handling COVID -19 among nurses in UMMC (n=123)

	Frequency (n)	Percentage (%)
Knowledge level		
Good	115	99.2
Poor	1	0.8
Attitude level		
Positive	48	39.0
Negative	75	61.0
Practice level		
Good	81	65.9
Poor	42	34.1

Table 5 summarises nurses' knowledge, attitude, and practice in UMMC. Majority of the respondents 99.2% (n= 115) score good knowledge and good practice (n=81,65.9%) about COVID-19 respectively. This study also found that most of the respondents (n=75, 61%) have a negative attitude about COVID-19.

4.6 Relationship between Knowledge, Attitude and Practice towards handling COVID-19 among nurses in UMMC

Table 6. Relationship between knowledge, attitude, and practice towards handling COVID-19 among nurses in UMMC (n=123).

Correlation	Correlation coefficient	p-Value
Knowledge score vs. Attitude score	-0.067	-0.089
Attitude score vs. Practice score	0.204*	0.024*
Practice score vs. Knowledge score	-0.089	0.327

*Correlation is significant at the 0.05 level.

Table 6 shows the relationship between knowledge, attitude, and practice in handling COVID-19. There is a significant and weak correlation between practice and attitude (p= 0.024, r= 0.204). However, there is no statistically significant negative relationship between knowledge and attitude (p= 0. 465, r= -0.067) and between knowledge and practice (p=0. 327, r= -0.089).

5.0 Discussion

5.1 Knowledge towards handling COVID-19 among nurses in UMMC
This study found that a vast majority of respondents, 98.4%, knew the mode of transmission of COVID-19 by performing hand hygiene after touching the patient's surroundings. In comparison, 100% were aware of its incubation period, the common symptoms, and high-risk individuals. This finding was similar to Salman et al. (2020), who reported that 94.2% of the respondents knew that a virus caused COVID-19. The respondent's good knowledge of handling COVID-19 is essential to reducing the outbreak of COVID-19 cases and its complications. According to Zhang et al. (2020), the greater the healthcare worker's knowledge, the more confident they were in defeating the virus. This study also found that all the respondents 100% knew to avoid crowded places.

Meanwhile, Zhong et al. (2020) reported that 96% of respondents practiced preventive practices by avoiding crowded places and wearing masks, decreasing the risk of getting affected by the disease. In this study, all the respondents (100%) agreed that a patient with COVID-19 infection should be immediately isolated to avoid the infection transfer to other people; there are laboratory tests to confirm the presence of COVID-19 infection. The result from this study found that the respondents also disagreed that COVID-19 is a similar virus as SARS-CoV and MERS-CoV (10.6%) and COVID-19 is the same illness as flu or cold (17.9%) which is better compared with a study by Hussain et al. (2020), who found that most of their respondents agreed that COVID-19 infections are the same illness like flu or cold (95.5%)

Furthermore, knowledge is essential to ensure that nurses can use it for self-treatment. Based on the findings, most respondents had good knowledge (Mean =13.63, SD=1.13). Therefore, this study shows that nurses have enough knowledge of handling COVID-19. Furthermore, good communication and no misleading information regarding COVID-19 among nurses contribute to good awareness since the messages are delivered well. Therefore, this can increase the knowledge time by time. Among nurses, knowledge of COVID-19 is necessary to prevent the illness from spreading among healthcare workers, the patient, and the community.

5.2 Attitude towards handling COVID-19 among nurses in UMMC
This study found that most respondents had a negative attitude (61%). This result was similar to Sazali et al. (2021), where most respondents had negative attitude scores regarding COVID-19 (71.9%). This might be because of the adaptation of the new norm. This situation makes the respondents openly and freely unaware of their health and providing care to the patient. This study also found that the respondents reported as neutral (8.9%) about avoiding touching the nose, mouth, and eyes can reduce the risk of transmission. While regarding preventing touching surfaces of doors, furniture, or other things that can help prevent the disease, 23.6% of the respondents reported as neutral, and 0.1% disagreed. The attitude is essential to prevent the transmission of the disease. Avoiding touching the nose, mouth, and eyes and wearing masks is crucial, as reported in studies by Zhong et al. (2020) and Hussain et al. (2020). In this study, the essential attitude adopted by respondents was that the nurses knew (100%) that the disease can be transmitted by coughing and sneezing, the transmission of COVID-19 infection can be prevented through wearing masks, and transmission of COVID-19 infection can be controlled through the isolation of COVID-19 infected patients (97.6%). Besides that, some nurses claimed the available information about COVID-19 disease is insufficient in Malaysian society (4.9%). Meanwhile, 12.2 % choose neutral impact on others. The finding of this present study is in line with the result of another research conducted in India (Maurya et al., 2020).

5.3 Practice towards handling COVID-19 among nurses in UMMC
The findings of this study indicated that the majority had good practice in handling COVID-19, where the respondents agreed that improving personal hygiene could minimize the incidence of SARS-COV-2 infections. In this study, respondents' level of practice in handling COVID-19 is good (65.9%). All the respondents (100%) performed hand hygiene before and after interaction with COVID-19 patients. This finding was consistent with Hussain et al. (2020) study, which reported that most respondents performed hand hygiene before and after interaction with COVID-19 patients (83.9%). This practice is to avoid the exposure of infectious diseases spreading among nurses. All nurses should do this regularly. Increasing a nurse's confidence and indirect interaction with COVID-19 patients significantly increases knowledge. Direct contact with patients motivates healthcare staff to learn about the disease and seek out scientific materials and guidelines (Zhou et al., 2020).

5.4 The Relationship between Knowledge, Attitude and Practice towards handling COVID-19 among nurses in UMMC
This study found a statistically significant relationship between the level of attitude and practice toward handling COVID-19 among nurses in UMMC (p<0.05). This finding is similar to Hussain et al. (2020). However, there was a significant weak correlation between practice and attitude. However, no relationship was found between knowledge and attitude and knowledge and practice. Based on this study, this result might be because of the variable exposure to COVID-19 that increases the disease's knowledge. Still, in some situations, too much information and knowledge also adapt to the new norm, making people especially feel the burden and sometimes try to find freedom by disobeying the orders from the Ministry of Health and organizations. Hence, knowledge should be applied together with the attitude and practice to combat this disease.

6.0 Conclusion and Recommendation
In conclusion, this study illustrates the importance of knowledge, attitude, and practice in handling COVID-19 among nurses. Respondents may be motivated to learn more about COVID-19, but nurses' attitude toward managing COVID-19 is poor. However, the level of knowledge and practice is good in handling COVID-19 among nurses. There is a significant and weak correlation between practice and attitude. Further training on COVID 19 should be implemented to improve the attitude and practice of COVID 19.

Furthermore, a targeted training program for healthcare workers, particularly nurses, can improve their understanding of COVID-19 infection risk and prevention techniques, allowing them to give proper care to their patients while protecting themselves from infection. Therefore, there is a need for a campaign to strengthen preventive practices such as physical distancing, hand washing, and respiratory etiquette. Hopefully, developing effective COVID-19 prevention and management strategies at the federal level can control the spread of COVID-19. Future research can focus on intervention programs to improve nurses' knowledge, attitude, and practice on COVID-19.

Paper Contribution to Related Field of Study
This paper contributes to the health and healing environment study.

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