INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 13, Issue 6, (2023) E-ISSN: 2222-6990

Critical Care Nurses' Knowledge, Attitude and Practice of Deliver Care to Patients with Corona Virus Disease 2019

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To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v13-i/17389 DOI:10.6007/IJARBSS/v13-i6/17389

Published Date: 08 June 2023

Abstract

Background. Effective nursing care for COVID-19 patients. Design: A cross-sectional study has been conducted. **Methods:** This study applied purposive sampling method at 159 nurse's intensive care units in Hospital Universiti Sains Malaysia, northern Malaysia. Data collected by structured questionnaires which consisted of four sections, Knowledge, attitudes, and practices of deliver nursing care for patients Covid -19 and demographic information for nurses. **Conclusions:** Finding show that nurses have positive attitude initiatives to improve the level of knowledge, and practices of nursing care for patients COVID -19, relevance to clinical practice. This proves that majority ICU nurses understood the basic information regarding COVID-19. Nursing management are encouraged to establish policies and supportive to staffs to increase and improved among ICU nurses to enhancing the quality of an excellent nursing care for COVID-19 patients.

Keywords: Advanced Nursing Knowledge, Attitudes, Practice, Covid -19, Malaysia

Introduction

Malaysia has been experiencing infectious disease outbreaks such as leptospirosis, encephalitis, SARS, and MERS-CoV that have tested and strengthened the emergency response systems (WHO, 2020). On 10th March, Prime minister has advised the public to practice social distancing, and on 11th March, WHO declared the COVID-19 outbreak a pandemic. Malaysia was under Movement Control Order (MCO) 1.0 on 18th March 2020 as a response of controlling the spread of infection over the country as cases in Malaysia has increased day per day starting in the first cases in January 2020.

Minister of Health (MOH) Malaysia has designated some government hospitals and screening centers in each state specifically for these outbreaks. Up to date, until 8th November 2021, the total number of confirmed cases in Malaysia is 40 209 cases, with 286 death, 28, 234 recovered cases, and 11, 689 active cases (MOH, 2020). 94 confirmed cases have been treated in the intensive care unit (ICU), where 32 cases are on ventilation support

(MOH, 2020). As coronavirus disease 2019 (COVID-19) spreads across the world, the intensive care units (ICU) community must prepare for the challenges associated with this pandemic. Thus, in this pandemic situation level of knowledge towards COVID-19 among nurses might affect their attitudes on care for those infected with COVID-19.

In addition, knowledge, and attitudes towards COVID-19 among nurses indirectly affected the efficiency of their practices indicatively on their prevention and infection control practices as they are being the high-risk exposure of COVID-19 to self, co-workers, patients, and family member. For instance, the knowledge about the transmission of COVID-19, prevention and infection control measurement and signs and symptoms of COVID-19. Therefore, nurses in ICU technically need to update their knowledge based on the real situation to deliver efficient nursing care toward COVID-19 patients treated in ICU respectively. Next, the level of knowledge can affect someone's attitude toward something. Hence, a satisfactory level of knowledge of COVID-19 will lead to a virtuous attitude toward COVID-19.

Literature Review

In previous studies, there were reported 99 cases of COVID-19 from the same hospital and the results suggested that 2019-nCoV infection clustered within the groups of humans in close contact. Whereas it was more likely to affect older men with comorbidities and may result in ARDS (Chan et al., 2020). Then in another study reported that the virus is transmitted via oral fluid droplets by asymptomatic infected individuals, specifically airborne via coughing and sneezing (Lu, etl, 2020). In addition, there are study that stated in the infected patient of COVID-19, SAR-CoV-2 nuclei acid can be found in feces and urine hence it is indicating that this virus can be transmitted via the fecal-oral route through the digestive tract (Lu et al., 2020).

Hence, the virus's future evolution, resilience, and propagation demand immediate attention (Lu et al., 2020). By study, SARS-CoV-2 is phylogenetically related to severe acute respiratory syndrome like (SARS-like) bat viruses. The patients' clinical manifestation included fever, non-productive cough, dyspnea, myalgia, fatigue, normal or decreased leukocyte counts, and radiographic evidence of pneumonia. There will be organ dysfunction (e.g., shock, acute respiratory distress syndrome [ARDS], acute cardiac injury, and acute kidney injury) and death can occur in severe cases (Wang et al., 2020). In previous study mentioned that the acute loss of taste (ageusia) and smell (anosmia) is a common symptom of COVID-19, it has affecting 20 to 85% of the infected patients (Khani et al., 2021). Regardless of whether they are symptomatic or asymptomatic, all individuals who meet the criteria for persons under investigation in the Ministry of Health COVID-19 guideline should be tested (MOH, 2020).

Meanwhile, nurses have been reported to experience deterioration of the quality of care due to moral distress from their perceived lack of competence in providing care (Corley et al., 2010), the perceived disruption of services caused by pandemics (Halcomb et al., 2020), the perception of increased workloads (Liu et al., 2020) and also due to additional tasks such as writing policies, educating staff and performing receptionist duties (Halcomb et al., 2020). It is suggested in another study that experiences nurses and expanding bits of knowledge regarding the realistic situation in acute care hospital units are proactive helps in handling the situations (Jason, 2020). From a previous study also the findings of nursing staff working experiences in terms of KAP showed that those that has ≤ 10 years working experiences has lower scored than those with working experiences ≥ 20 years (Wen et al., 2021)

Methodology

This study, samples were selected from the list of hospital intensive care in hospital University Sains Malaysia, North Malaysia. To achieve the research objective, the selected of sample plan included the selection of criteria for participants, sampling process, and sample size estimation. A cross sectional study design and continues with a description of the study setting, population, and sample plan. The questionnaire is consisting of 3 sections. Section A is about socio-demography of the respondent. Section B is about knowledge, attitude, and practice to deliver care to patients COVID-19. Section C is correlation between the level of Knowledge, Attitude, and Practices to deliver care for patients COVID-19 among ICU nurses in north Malaysia.

Data collections were collecting through online self -administered questionnaire in google from platform. 'The link of Google from were distributed to target populations in Google in this study, the data were collected through online self-administered questionnaire in Google form platform. The link of Google form was distributed to targeted population using WhatsApp application and emails. Data analysis are continuous variables were presented as means and standard deviations, whereas categorical variable as frequencies and percentages (SD). All the demographic factors and responses to questions related to knowledge, attitudes, and practices of nurses toward COVID-19 were described using descriptive analysis. Eligible respondent This study was conducted after permission granted by HREC, Director of Hospital USM and the Head of Nursing department in Hospital USM.

Results

Demographic characteristic for nurses

Demographic characteristics for nurses (listed in table 1) met the inclusions criteria and 159 nurses completed return. There were 141 (88.7%) female respondents and 18 (11.3%) male respondents which aged (M=34.26, SD= 5.550) between minimal age is 24 years old and maximum aged 54 years old. Majority of the respondents are from Malay ethnicity which is 145 respondents (91.2%), followed by Chinese respondents, 13 (8.2%) and the minority ethnicity is Rungius, 1 respondent (0.6%). Next, the education level for most of respondents are diploma which 149 respondents (93.7%), 9 respondents (5.7%) have degree and only 1 respondent (0.6%) have master. Then, there were 4 respondents (2.5%) has less than 3 years of nursing experiences, while 64 respondents (40.3%) have 3 to 10 years of nursing experiences and 91 respondents (57.2%) has more than 10 years of nursing experiences.

Table 1
Demographic characteristics of respondents (n =159)

Mean Age Standard deviations (SD) 34.26 (5.550) [min-max] (24- 54)		
Variables **Gender**	**Frequency (n)**	**Percentage (%)**
Female	141	88.7
Male	18	11.3
Ethnicity		
Malay	145	91.2
Chinese	13	8.2
Indian	0	0
Others	1	0.6
Rungius	145	91.2
Educational level		
Diploma	149	93.7
Degree	9	5.7
Master	1	0.6
PhD	0	0
Nursing experience (years)		
<3 years	4	2.5
3-10 years	64	40.3
>10 years	91	57.2

Knowledge, Attitude, and Practice of Deliver Care to Patients with Corona Virus Disease 2019

The average percentage indicating the intensive care unit nurses' (n =159) for deliver nursing care to patients Covid -19 for knowledge were n 104 = (65.1%), attitude n= 108 (67.9%), practices n= 92 (57.9%) respectively.

The frequency and percentages of questions about knowledge toward COVID-19 among ICU (n=159)

Table 2 shown the frequency and percentages of question about knowledge toward COVID-19 among ICU nurses in northern Malaysia. Based on the result, it reveals that 69.8 respondents aware that person to person transmission can occur by droplets, 63.9% respondents acknowledge that COVID-19 transmission can be airborne and 67.3% respondent aware that most common of COVID-19 signs and symptoms. Include fever, diarrhoea, and dyspnoea.

About 89.3 % of the respondent that aware wearing surgical masks during shift is one of the effective ways to protect self from potentially infected COVID-19 patients. Other than that, washing hands frequently with soap and water, rubbing hands with alcohol-based gel, wearing gloves, and changing them frequently, maintain a physical separation of at least 1.5m and limit the amount of time interacting with an individual who has respiratory symptoms, about 77.4%, 62.3%, 42.8%, 54.1% and 64.2% respondent respectively enlightened as the effective ways to protect self from potentially infected COVID-19 patients.

Next, about 51.6%, 34.6% and 15.7% respondents claimed that 10 days, 14 days, and 7 days respectively is the isolation period of a person that unvaccinated in case of covid-19 infection for clinical category 2-3. Then, majority respondents (90.5%) conclude that someone vaccinated who has been quarantined for COVID-19 can spread the illness to other if the quarantine period less than required while there are minority of respondents (3.2%) did not sure about it.

There are about 78.0% of the respondents aware that wear a facemask and stay home if having any respiratory symptoms is the ways to protect self. In addition, majority of respondents (96.2%) accepted that a person tests negative and later positive for COVID-19. Next, about 52.2% of respondent aware that a suspected person was tested negative but has no symptoms can be a false negative as it was in the PR symptomatic phase meanwhile 45.9% trusted that it is a true negative and 7.5% of respondents is do not know how to interpret the test result and preferred to refer a specialist.

Subsequently, 79.2% of respondents aware that there is a risk to go to the funeral of someone who died of COVID-19, 15.7% of respondents claimed that there is no known risk currently and 5.7% of the respondent do not know.

Table 2

The frequency and percentages of questions about knowledge to deliver care to COVID-19 among ICU (n=159)

tions	**Frequency (n)**	**Percentage (%)**
1. Which of the following is true about COVID-19?		
a) Person to person transmission can occur by droplets	111	69.8
b) Transmission can be airborne	100	62.9
c) Most common signs and symptoms include fever, diarrhoea, and dyspnoea	107	67.3
d) I do not know	0	0
2. Effective method to protect yourself from potentially infected patients?		
a) Wearing surgical mask during shift	142	89.3
b) Washing hands frequently with soap and water	123	77.4
c) Rubbing hands with alcohol-based gel	99	62.3
d) Wearing gloves and changing them frequently	68	42.8
e) Maintain a physical separation of at least 1.5m	86	54.1
f) Limit the amount of time interacting with an individual who has respiratory symptoms	102	64.2
3. For how long should a person that UNVACCINATED be isolated in case of COVID-19 infection FOR CLINICAL CATEGORY 2-3?		
a) 14 days	55	34.6
b) 7 days	25	15.7
c) 10 days	82	51.6
d) 20 days	0	0
e) >20 days	0	0

4. Can someone VACCINATED who has been quarantined for COVID-19 spread the illness to others?		
a) Yes, if quarantine period is less than required	143	90.5
b) No, even the quarantine period is less than required	10	6.3
c) I do not know	5	3.2
5. What are the steps to take to protect yourself?		
a) Wash your hands with soap and water for at least 10 s	68	42.8
b) Wash your hands with soap and water for at least 20 s	46	28.9
c) Avoid close contact, put distance between yourself and other people (1.5m-2m)	131	82.4
d) Wear a facemask and stay home if you have any respiratory symptoms	124	78
e) No need to clean and disinfect solid objects (i.e., tables, doorknobs, desks, phone etc.)	3	1.9
Questions	**Frequency (n)**	**Percentage (%)**
6. Can a person test negative and later positive for COVID-19?		
a) No	7	4.4
b) Yes	153	96.2
c) I do not know	0	0
7. If a suspected person tests negative but has no symptoms?		
a) It is a true negative	73	45.9
b) It can be a false negative in the presymptomatic phase	83	52.2
c) I do not know how to interpret this test result; I refer to a specialist.	12	7.5
8. Is the person at risk if he/she goes to the funeral of someone who died of COVID-19?		
a) Yes, since he/she will meet the dead person close contacts	126	79.2
b) No known risk currently	25	15.7
c) I do not know	9	5.7
9. When can confirmed COVID-19 cases be released from quarantine?		
a) Once complete their isolation period and clinically stable.	138	86.8
b) After maximum isolation period of 14 days after symptom onset if they need to transfer to non-COVID-19 ward for further treatment for their medical/surgical problem.	55	34.6
c) Category 5, patient in ICU, who still required beyond 20 days of illness can also be discharged from COVID case.	34	21.4
d) I do not know	0	0
10. Should I avoid contact with pets or other animals if I am sick with COVID-19?		
a) No	4	2.5
b) Yes	146	91.8
c) I do not know	9	5.7
11. Who are the people most affected with COVID-19?		
a) Elderly	100	62.9
b) People with underlying illness and comorbidities	152	95.6
c) Children	57	35.8
d) Adolescents	20	12.6

e) Adults	25	15.7
12. What are the most common symptoms related to COVID-19?		
a) Fever	156	98.1
b) Cough	139	87.4
c) Diarrhoea	106	66.7
d) Rhinorrhoea	46	28.9
e) Dyspnoea	67	42.1
f) Pharyngitis	60	37.7
g) None of the above	1	0.6
13. Indicated which of the following options can be used to treat COVID-19 to date?		
a) Supportive care to help the person on breathing if needed	81	50.9
b) Non-steroidal anti-inflammatory drugs (NSAIDS	30	18.9
c) Paracetamol	102	64.2
d) Symptomatic treatment	90	56.6
e) Rest and stay at home	109	68.6
f) There is no specific medicine available to date	37	23.3

Then, about 86.8 % of respondent trusted that COVID-19 patients can after they complete the isolation period and clinically stable, 34.6% of respondents conclude that after maximum isolation period of 14 days after symptom onset, they can be transfer to non-COVID ward for further treatment for their medical/ surgical problem and 21.4 % aware that Category 5, patient in ICU, who still required beyond 20 days of illness can also be discharged from COVID case.

As for question 10, about 91.8% of respondent aware that they should avoid contact with animals as they infected with COVID-19, 5.7% do not aware about it and 2.5% claimed that they should not avoid animals even if they infected with COVID-19. In addition, 62.9%, 95.6%, 35.8%, 12.6% and 15.7% of respondents that aware elderly, people with underlying illness and comorbidities, children, adolescents, and adults respectively as people most affected with COVID-19. Next, about 98.1% of respondent aware that fever is the most common symptoms related to COVID-19, 87.4% of response for cough, 66.7% of response for diarrhoea, 42.1% of response for dyspnoea, 37.7% of response for pharyngitis, 28.9% of response for rhinorrhoea and 0.6% that chose none of the above.

Lastly, the responses of options can be used to treat COVID-19 to date, 68.6% responses for rest and stay at home, 64.2% responses for paracetamol, 56.6% response for symptomatic treatment, 50.9% responses for supportive care to help the person on breathing if needed, 23.3% response for no specific medication available to date and 18.9% for non-steroidal anti-inflammatory drugs (NSAIDs).

Table 3
Correlation between Knowledge, Attitude, and Practices toward COVID-19 among ICU nurses in Hospital USM. (n=159)

Variables	Knowledge		Attitudes		Practices	
	P-value	***r***	***p*-value**	***r***	***p*-value**	***r***
Knowledge	0	1	0.618	0.040	0.771	0.023
Attitudes	0.618	0.040	0	1	0.001	0.272**
Practices	0.771	0.023	0.001	0.272**	0	1

**. Correlation is significant at the 0.01 level (2-tailed).
Meanwhile, there are significant correlation between level of attitude and level of practices (p= 0.001).

Discussions
Our finding is consistent with previous study that satisfaction Knowledge, Attitude, And Practice of deliver care to patients with Corona Virus Disease 2019. The findings in this study revealed that ICU nurses were n 104 = (65.1%) knowledge, attitude n= 108 (67.9%), practices n= 92 (57.9%) respectively.

Knowledge, attitude, and practices (KAP) among nurses regarding, COVID-19 based on researcher findings, there about 10 previous studies that related to the current study. Among the ten studies included in this review, one is from Philippines. Navales et al (2021), one is from Occupied Palestinian Territory (oPt) (Shawahna, 2021a), one is from Nigeria Ejeh et al (2020), one is from Saudi Arabia (Temsah et al., 2021), others two from Ethiopia Tadesse et al (2020); Feleke et al (2021), one is from India Mahato & Suryavanshi (2020), one is from Uganda Olum et al (2020), one is from China Wen et al (2021) and one is from Lebanon (Saadeh et al., 2021). Overall, most study indicated that nursing staff KAP scored well.

While this approach may be acceptable to the nurses desiring an active role in delivering care for patients with Corona Virus Disease 2019, this approach increasing prevention infection in communities. Hence, the coronavirus disease 2019 (COVID19) is a highly communicable and pathogenic viral infection caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV 2) that resulted in a global pandemic and a significant loss of human life (Lu et al., 2020).

We found that's the significant correlation between level of attitude and level of practices (p= 0.001). This proving at majority ICU nurses understood the basic information regarding COVID-19. Furthermore, most respondents felt they are responsibilities and concerns to delivery care for patients with Corona Virus Disease 2019. The respondent role provides specialized care of patient whose conditions are life-threatening and required constant monitoring and comprehensive care (Crocker, 2007).

Based on the results, it was shown that mostly ICU nurses are rarely being afraid of exposure to this infection and rarely feel stress or exhausted from this pandemic. However, they are cautious about their loved ones as they can spread the exposure to them. Thus, this can be one of the factors for them practicing a better self-protect and shrewdness of COVID-

19. Thus, future studies might want to highlight these issues and ensure to provide support in psychological problems that might occurs among nurses due to anxiety or guilty.
The study was aiming for assess knowledge, attitude, and practices toward COVID-19. To improve this study for future research, it is recommended to carry out this research in a larger sample size involving whole healthcare workers such as doctors, pharmacist, medical assistant, radiologist, physiologist, diabetic educator, psychologist, and those that worked in hospital settings particularly that exposed to patients, to identify their level of knowledge, attitudes and practices towards COVID19 as they also worked in hospital settings.

Conclusions

In this study, we found that's ICU nurse in Hospital USM have good knowledge, good attitude and good level of practises deliver of care to patients COVID-19. This proves that majority ICU nurses understood the basic information regarding COVID-19. In addition, further education to convey the importance of forming a positive attitude and continuous preventive practices toward COVID-19 is essential as it is a holistic characteristic for a professional nursing career.

Acknowledgements

We are grateful to members of the Hospital Universiti Sains Malaysia north Malaysia provided collaborations and to the research nurses at all sites who collected data for this research.

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References

Crocker, C. (2007). The development of critical care in England. *Intensive and Critical Care Nursing*, *23*(6), 323–330.

Chan, J. F. W., Yuan, S., Kok, K. H., To, K. K. W., Chu, H., Yang, J., Xing, F., Liu, J., Yip, C. C. Y., Poon, R. W. S., Tsoi, H. W., Lo, S. K. F., Chan, K. H., Poon, V. K. M., Chan, W. M., Ip, J. D., Cai, J. P., Cheng, V. C. C., Chen, H., … Yuen, K. Y. (2020). A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to person transmission: a study of a family cluster. *The Lancet*, *395*(10223), 514–52

Ejeh, F. E., Saidu, A. S., Owoicho, S., Maurice, N. A., Jauro, S., Madukaji, L., & Okon, K. O. (2020). Knowledge, attitude, and practice among healthcare workers towards COVID-19 outbreak in Nigeria. *Heliyon, 6*(11).

Feleke, D. G., Chanie, E. S., Tilaye, B. A., Mesfin, D., Birhane, B. M., Bayih, W. A., Tassew, S. F., Asnakew, S., Berlie, T. A., Dires, T., Dagnaw, E., & Tadesse, T. Y. (2021). Knowledge, attitude, and associated factors towards COVID-19 among nurses who work in South

Khani, E., Khiali, S., Beheshtirouy, S., & Entezari-Maleki, T. (2021). Potential pharmacologic treatments for COVID-19 smell and taste loss: A comprehensive review. *European Journal of Pharmacology*, *912*, 174582.

Lu, R., Zhao, X., Li, J., Niu, P., Yang, B., Wu, H., Wang, W., Song, H., Huang, B., Zhu, N., Bi, Y., Ma, X., Zhan, F., Wang, L., Hu, T., Zhou, H., Hu, Z., Zhou, W., Zhao, L., … Tan, W. (2020). Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *The Lancet*, *395*(10224), 565–574. 10.1016/S0140-6736(20)30251-8

Olum, R., Chekwech, G., Wekha, G., Nassozi, D. R., & Bongomin, F. (2020). Coronavirus Disease-2019: Knowledge, Attitude, and Practices of Health Care Workers at Makerere University Teaching Hospitals, Uganda. *Frontiers in Public Health*, *8*.

Saadeh, D., Sacre, H., Hallit, S., Farah, R., & Salameh, P. (2021). Knowledge, attitudes, and practices toward the coronavirus disease 2019 (COVID-19) among nurses in Lebanon. *Perspectives in Psychiatric Care*, *57*(3), 1212–1221. https://doi.org/10.1111/PPC.12676

Shawahna, R. (2021a). Knowledge, attitude, and use of protective measures against COVID-19 among nurses: a questionnaire-based multicenter cross-sectional study. *BMC Nursing*, *20*(1), 163.

Shawahna, R. (2021b). Knowledge, attitude, and use of protective measures against COVID-19 among nurses: a questionnaire-based multicenter cross-sectional study. *BMC Nursing*, *20*(1).

Tadesse, D. B., Gebrewahd, G. T., & Demoz, G. T. (2020). Knowledge, attitude, practice, and psychological response toward COVID-19 among nurses during the COVID-19 outbreak in northern Ethiopia, 2020. *New Microbes and New Infections*, *38*.

Temsah, M. H., Al Huzaimi, A., Alrabiaah, A., Alamro, N., Al-Sohime, F., Al-Eyadhy, A., Alhasan, K., Kari, J. A., Alhaboob, A., Alsalmi, A., AlMuhanna, W., Almaghlouth, I., Aljamaan, F., Halwani, R., Saddik, B., Barry, M., Al-Zamil, F., AlHadi, A. N., Al-Subaie, S., Somily, A. M. (2021). Changes in healthcare workers' knowledge, attitudes, practices, and stress during the COVID-19 pandemic. *Medicine*, *100*(18), e25825.

Wang, D., Hu, B., Hu, C., Zhu, F., Liu, X., Zhang, J., Wang, B., Xiang, H., Cheng, Z., Xiong, Y., Zhao, Y., Li, Y., Wang, X., & Peng, Z. (2020). Clinical Characteristics of 138 Hospitalized Patients with 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA - Journal of the American Medical Association*, *323*(11), 1061–1069.

Wen, X., Wang, F., Li, X., & Gu, H. (2021). Study on the Knowledge, Attitude, and Practice (KAP) of Nursing Staff and Influencing Factors on COVID-19. *Frontiers in Public Health*, *8*, 966.

Jason P., Li W. Lowell L., Moritoki E., Prof. Chae-Man L. Prof Jigeeshu V. D. et al. (2020) Intensive care management of coronavirus disease 2019 (COVID-19): challenges and recommendations. The Lancets Respiratory Medicine. Vol 8, Issue 5, P506-517.

Malaysia ICU protocol managements. (2019). Available from: http://www.msic.org.my/ Ministry of Health, Malaysia. Guidelines COVID-19 management in Malaysia no.5/2020. 5th ed. (2020). Available from: http://covid-19.moh.gov.my/garispanduan/garis-panduan-kkm

Zulfakar, M. M. W., Fadzlina, W. M. S., Mahamarowi, O. (2020) Treating COVID-19 Patient in the Intensive Care Unit. Available at http://covid19.kk.usm.my/artikel/medicalprofessional/74-treating-covid-19-patients-in-the-intensive-care-unit

Medic's. (2016) Intensive Care Unit (ICU). Department Of Anaesthesiology and Intensive Care, School of Medical Sciences, Health Campus, and Universiti Sains Malaysia. Available from https://medic.usm.my/anaest/index.php/en/clinical-services/2016-08-21-04-37-1

Navales, J. V., Jallow, A. W., Lai, C. Y., Liu, C. Y., & Chen, S. W. (2021). Relationship between quality of nursing work life and uniformed nurses' attitudes and practices related to COVID-19 in the Philippines. A cross-sectional study. *International Journal of Environmental Research and Public Health, 18(19).*

World Health Organization. (2020) Coronavirus disease (COVID-19). Retrieved from https://www.who.int/emergencies/diseases/novelcoronavirus2019?adgroupsurvey={adgroupsurvey}&gclid=CjwKCAiA1uKMBhAGEiwAxzvX9y6Oz3MU3Bt5H1mgU2NHZx2y1ed oYdT_qIXvrCNNmVoGnhsyUPmS_xoCM88QAvD_BwE World Health Organization. Coronavirus disease (COVID-19) Situation Report 109 (2020) Available from: https://www.who.int/docs/default-source/coronaviruses/situation reports/20200508covid-19-sitrep-109.