# KNOWLEDGE, ATTITUDES, AND PRACTICES TOWARD CORONAVIRUS DISEASE 2019 AMONG INTENSIVE CARE UNIT NURSES IN HOSPITAL UNIVERSITI SAINS MALAYSIA

CHRISTIE LILY AIDA PIUS PAUL

SCHOOL OF HEALTH SCIENCES

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by

CHRISTIE LILY AIDA PIUS PAUL

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| | |
|---|---|
| ARDS | Acute Respiratory Distress Syndrome |
| CDC | Centre for Disease Control and Prevention |
| COVID-19 | Coronavirus Disease 2019 |
| MCO | Movement Control Order |
| MERS-CoV | Middle East Respiratory Syndrome-Related Coronavirus |
| MOH | Ministry of Health |
| M | Mean |
| SARS-CoV | Severe Acute Respiratory Syndrome-Related Coronavirus |
| SARS-CoV-2 | Severe Acute Respiratory Syndrome-Related Coronavirus 2 |
| SD | Standard Deviation |
| SPSS | Statistical Package for Social Science |
| PHEIC | Public Health Emergency of International Concern |
| WHO | World Health Organization |

**PENGETAHUAN, SIKAP DAN AMALAN TERHADAP PENYAKIT CORONAVIRUS 2019 DALAM KALANGAN JURURAWAT PENJAGAAN KRITIKAL DI HOSPITAL UNIVERSITI SAINS MALAYSIA**

## ABSTRAK

COVID-19 ialah penyakit berjangkit yang disebabkan oleh coronavirus yang baru ditemui di Wuhan, China pada 2019. Oleh itu, COVID-19 merebak ke seluruh dunia, komuniti unit rawatan rapi (ICU) mesti bersedia untuk menghadapi cabaran yang berkaitan dengan wabak ini. Kajian keratan rentas telah dijalankan untuk menilai tahap pengetahuan, sikap dan amalan terhadap COVID-19 dalam kalangan jururawat ICU di Hospital USM. Kajian ini juga mengkaji hubungan antara tahap pengetahuan, sikap dan amalan terhadap COVID-19 dalam kalangan jururawat ICU di Hospital USM. Selain itu, kajian itu juga mengkaji perkaitan antara data sosio-demografi responden (umur, jantina, etnik, tahap pendidikan dan tahun dalam amalan kejururawatan) dan tahap pengetahuan, sikap dan amalan terhadap COVID-19. Ujian Pearson Correlation Coefficient digunakan untuk menentukan korelasi antara tahap pengetahuan, sikap dan amalan terhadap COVID-19 dan untuk menentukan perkaitan antara data sosio-demografi responden (umur, jantina, etnik, tahap pendidikan dan tahun dalam amalan kejururawatan) dan tahap pengetahuan, sikap dan amalan terhadap COVID-19. Seramai 159 jururawat ICU dari wad ICU telah memberikan penyertaan dalam persampelan bertujuan. Data dikumpul dari September 2021 hingga Jun 2022 menggunakan borang google dan dianalisis menggunakan SPSS versi 26.0. Kebanyakan responden adalah perempuan (88.7%). Keputusan menunjukkan bahawa keseluruhan jururawat ICU mempunyai tahap pengetahuan yang sederhana terhadap COVID-19, tahap sikap yang lemah terhadap COVID-19 dan tahap amalan yang baik terhadap COVID-19. Selain itu, dapatan kajian mendapati tiada perkaitan yang signifikan antara tahap pengetahuan dan sikap terhadap COVID-19 ($p > 0.05$). Seterusnya, , dapatan kajian adalah tidak terdapat perkaitan yang signifikan antara tahap pengetahuan dan amalan terhadap COVID-19 ($p > 0.05$). Manakala, terdapat perkaitan yang

signifikan antara tahap sikap dan tahap amalan (p= 0.001). Dapatan mengenai perkaitan antara data sosio-demografi responden (umur, jantina, etnik, tahap pendidikan dan tahun pengalaman kejururawatan) dan tahap pengetahuan, sikap dan amalan, hanya terdapat signifikan anatra umur dengan pengetahuan di mana p-value adalah 0.015. Kesimpulannya, tahap pengetahuan dan tahap sikap perlu ditingkatkan dan dipertingkatkan dalam kalangan jururawat ICU agar mereka dapat memberikan asuhan kejururawatan yang cemerlang untuk pesakit COVID-19.

**KNOWLEDGE, ATTITUDES, AND PRACTICES TOWARD CORONAVIRUS DISEASE 2019 AMONG INTENSIVE CARE UNIT NURSES IN HOSPITAL UNIVERSITI SAINS MALAYSIA**

## ABSTRACT

COVID-19 is an infectious disease caused by a newly discovered coronavirus at Wuhan, China on 2019. Hence, COVID-19 spreads across the world, the intensive care units (ICU) community must prepare for the challenges associated with this pandemic. A cross-sectional study has been conducted to assess the level of knowledge, attitudes and practices towards COVID-19 among ICU nurses in Hospital USM. This study also examined the correlation between level of knowledge, attitudes and practices toward COVID-19 among ICU nurses in Hospital USM. In addition, the study also examined the association between the socio-demographic data of respondents (age, gender, ethnicity, level of education and years in nursing practices) and the level of knowledge, attitudes and practices toward COVID-19. The Pearson Correlation Coefficient test was used to determine the correlation between the level of knowledge, attitudes and practices toward COVID-19 and to determine the association between the socio-demographic data of respondents (age, gender, ethnicity, level of education and years in nursing practices) and the level of knowledge, attitudes and practices toward COVID-19. A total 159 ICU nurse from ICU wards were recruited through purposive sampling. Data were collected from September 2021 to June 2022 using google form and analysed using SPSS version 26.0 for a window. Most of the respondents are female (88.7%). The results revealed that overall ICU nurses had a moderate level of knowledge towards COVID-19 , poor level of attitudes towards COVID-19 and good level of practices towards COVID-19. In addition, the findings were there was no significant association between level of knowledge and attitudes toward COVID-19 (p

>0.05). Next, , the findings were there was no significant association between level of knowledge and practices toward COVID-19 (p >0.05). Meanwhile, there are significant association between level of attitude and level of practices (p= 0.001). The findings about the association between socio-demographic data of respondent (age, gender, ethnicity, level of education and years of nursing experiences) and the level of knowledge, attitudes and practices, there is significant only between age and knowledge as the p-value is 0.015. In conclusion, the level of knowledge and level of attitudes needs to increased and improved among ICU nurses so they will be able to delivery an excellent nursing care for COVID-19 patients.

# Chapter 1 : Introduction

## 1.1 Background of the study

Novel coronavirus disease 2019 (COVID-19) was first discovered in December 2019 in Wuhan, China. It is known as an acute respiratory infection and is easily transmitted via droplets (WHO, 2020). The virus is origin in bats and then transferred to humans that consume it. The infected person usually has a fever, sore throat, and dry cough. Some might present difficulty of breathing, while others might be asymptomatic. This disease was announced as a pandemic in March 2020 by World Health Organization (WHO) when it started to be found in multiple countries around the world. COVID-19 has globally spread that caused almost every country to propose a lockdown phase period to cut the chain of infection. Global intentionally emphasizes the public health responses to the pandemic and the capacity of acute care services to meet the demands of those infected with COVID-19 (Commonwealth of Australia, 2020).

In Malaysia, there is a robust health system with universal health coverage where Malaysian can access the health services they need (WHO, 2020). 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). The first cases were detected in Malaysia on 25th January 2020, 3 Chinese nationalities as close contact 1 (CC1) of an infected person in Singapore. They were quickly treated at Sungai Buloh Hospital. Then on 4th February 2020, the first Malaysian was confirmed with COVID-19, a 41 years male who recently returned from Singapore. He developed a fever and cough and was then quarantined at Sungai Buloh Hospital. Therefore, 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.

Thus, 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 on 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).

## 1.2 Problem statement

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. Streamlining workflows for rapid diagnosis and isolation, clinical management, and infection prevention will matter to patients with COVID-19, healthcare workers, and other patients at risk from nosocomial transmission (Jason, 2020). Next, people are paying more attention than usual to ICUs where the worst-affected COVID-19 patient is placed (Geraldine, 2020). Most of the COVID-19 that have been treated in ICU are those that have commodities such as chronic diseases, pregnant women and weak immune systems. Those who are categorised as Group 4 or 5 of COVID-19 according to the MOH guideline of management for COVID-19 patients might need intubation almost immediately in ICU (Geraldine, 2020) Group 4 refers to patients with COVID-19 pneumonia requiring oxygen, whereas Group 5 refers to those who critically ill with multi-organ failure (MOH, 2020). These people need intensive care and monitoring. The COVID-19 virus is transmissible, normal workflow

processes in the ICU ranging from prescribing drugs to performing chest X-rays had to be changed (Geraldine, 2020). Thus, the knowledge of this pandemic is essential for everyone, particularly those dealing with COVID-19 patients. 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. 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 being the high-risk exposure of COVID-19 to self, co-workers, patients and family member.

In the previous study, 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, Lou, 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)

## 1.3 Research question

These following is the research question formulated to guide the research study:

a. What is the level of KAP towards COVID-19 among ICU nurses in Hospital USM?
b. Is there correlation between knowledge, attitude and practices towards COVID-19 among ICU nurses in Hospital USM?
c. Is there association between social characteristic of nurses (gender, age, ethnic, level education and work experiences) and the level of KAP towards COVID-19 among ICU nurses in Hospital USM?

## 1.4 Research Objectives

### 1.4.1 General Objectives:

To assess the knowledge, attitude and practices toward COVID-19 among ICU nurses in Hospital USM.

### 1.4.2 Specific Objectives

The specific objectives for the study are as follows:

a) To determine the level of knowledge, attitude and practices toward COVID-19 among ICU nurses in Hospital USM.
b) To determine the correlation between knowledge, attitude and practices among ICU nurses in Hospital USM.

c) To determine the association between the social character of nurses (gender, age, ethnicity, level education and work experiences) and the level of KAP towards COVID-19 among ICU nurses in Hospital USM.

## 1.5 Hypothesis

1. H0: There is no significant correlation between knowledge, attitude and practices among ICU nurses in Hospital USM

   HA: There is a positive correlation between knowledge, attitude and practices among ICU nurses in Hospital USM

2. H0: There is no significant association between social characteristic of nurses (gender, age, ethnic, level education and work experiences) and the level of KAP towards COVID-19 among ICU nurses in Hospital USM.

   HA: There is an association between social characteristic of nurses (gender, age, ethnic, level education and work experiences) and the level of KAP towards COVID-19 among ICU nurses in Hospital USM.

## 1.6 Conceptual and operational definitions

Table 1.1 Definitions for the operational terms used in this research proposal

| Terms | Conceptual | Operational |
|---|---|---|
| Attitude | Attitude is a settled way of thinking or feeling about | In this study, attitudes is about nurses' feelings and thinking about handling COVID-19 |

| | | |
|---|---|---|
| | something. (Merriam-Webster Dictionary, 2021). | patient in the ICU of Hospital USM. |
| COVID-19 | COVID-19 is defined as an illness caused by a novel coronavirus now called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by World Health Organization (WHO, 2020). | The knowledge about COVID-19 can improve the attitudes and practices in the care of COVID-19 patients. |
| Intensive Care Unit | ICU is a unit in a hospital providing intensive care for critically ill or injured patients that are staffed by specially trained medical personnel and has equipment that allows for continuous monitoring and life support (Merriam-Webster Dictionary, 2021) | In this study, ICU is referring to hospital wards that provide intensive care for critically ill or injured patients in Hospital USM. Thus, it specifically involved 1 Mutiara (General ICU), 1 Nilam (Neonate ICU), Surgical ICU and Trauma ICU of Hospital Univerisiti Sains Malaysia. |
| Knowledge | Knowledge is a familiarity, awareness, or understanding of someone or something through experience or education by perceiving, discovering or learning (Merriam-Webster Dictionary, 2021). | In this study, knowledge is referred to the cognition of nurses in ICU towards COVID-19 at Hospital USM. |

| | | |
|---|---|---|
| Practice | The actual application or use of ideas and belief (Candy & Edmonds, 2018) | The ability to practices the prevention and infections control of COVID-19 among nurses in ICU of Hospital USM. |
| Nurse | A nurse is a person who has completed a program of basic, generalized nursing education and is authorized by the appropriate regulatory authority to practices nursing in their own country (Hertz K & Santy T J, 2018). | The nurse refers to nurses that worked in the ICU wards in Hospital USM. |

## 1.7 Significance of the study

The findings of this study will assess the level of knowledge, attitude and practices regarding COVID-19 among the nurses in charge in an intensive care unit. Thus, the results of this study will unveil the standard of quality in nursing care at ICU in Hospital USM towards COVID-19 patients. Last but not least, this study will help nurses to be alert that they should update their KAP whilst realistic situation as in time with the care for COVID-19 patients.

# Chapter 2: Literature Review

## 2.1 Introduction

This chapter generally discuss about COVID-19 epidemiology, sign and symptoms, transmission, treatment and practices of infection prevention. Roles of nurses in ICU and their important in caring for COVID-19 patient also will be discuss in this chapter. The previous researches about knowledge, attitudes and practices toward COVID-19 among nurses also will be review in this chapter  In addition, the conceptual framework used in this study will be describe in detail following.

## 2.2 Introduction of COVID-19

Coronaviruses are part of the *Coronaviridae* family in *the Nidovirales* order. The coronavirus was named after the crown-like spikes on the virus's outer surface. Coronaviruses are compact 965-125 nm in diameter) and contain a single-stranded RNA nucleic material with a length of 26-32 kbs (Shereen et al., 2020). In December 2019, a cluster of patient with ties to Huanan South China Seafood Market in Wuhan, Hubei Province, China became infected with the third zoonotic human coronavirus (CoV) of the century (Gralinski & Menachery, 2020). Hence, the coronavirus disease 2019 (COVID-19) 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. Consequently, bats could be the primary reservoir, according to genomic study. Structural research reveals that 2019-nCov could attach to human angiotensin-converting enzyme 2 receptor (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 (aguesia) 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).

## 2.3 Transmission of COVID-19

Although the source of genesis and transmission to humans is unknown, the rapid human to human transfer has been generally proven (Shereen et al., 2020).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 (Yang &Wang, 2020). In addition, there are study that stated in the infected patient of COVID-19, SAR-CoV-2 nuclei acid can be found in faeces and urine hence it is indicating that this virus can be transmitted via the faecal-oral route through the digestive tract (Yang &Wang, 2020).

## 2.4 Treatment of COVID-19

COVID-19 has yet to be treated with a clinically licence antiviral medication. However, few broad-spectrum antiviral medicines have been tested in clinical trials against COVID-19, with clinical recovery (Shereen et al., 2020). Based on previous studies, it is moderately recommendation that intranasal insulin act as neuroprotective give beneficial effects in olfactory dysfunction caused by infection COVID-19 and other disease evidenced by moderate-quality randomized clinical trial to treat the symptoms of smell and taste loss (Khani et al., 2021).Other than that, intranasal fluticasone act as anti-inflammatory give beneficial in COVID-19 smell loss is moderately recommends to treat the smell loss with quality of evidence using moderate-quality non-randomized clinical trial (Khani et al., 2021). Next, there are recommendations from previous study regarding the treatment for those infected with this virus which is applied an appropriate symptomatic treatment and supportive care including oxygen therapy, fluid management, and antibiotic treatments for secondary bacterial infections (Huang et al., 2020).

While in Malaysia, the patients will be divided into five groups based on the results of a confirmatory test, each with its own treatment plan (MOH, 2020). Asymptomatic patients are classified as Group 1, those with symptoms but no pneumonia are classified as Group 2, those with pneumonia are classified as Group 3 and those in Group 4 and 5 are at high risk of developing more serious illness, necessitating ICU hospitalisation (Malaysian Society of Intensive Care, 2019). The treatment consist of both general and specialised care. General care for most patients comprises early feeding, analgesia, sedation, thromboembolism prophylaxis, head up elevation, stress ulcer prophylaxis and glycaemic control which summarised by the acronym FAST HUG (Malaysian Society of Intensive Care, 2019).

Hydroxychloroquine which is the function to inhibit endocytic pathways has been proposed as drug to treat patients COVID-19 by increasing the pH of the endosomes to prevent the pH-dependent entry of the virus into the host cell (Elongoe, 2020).

## 2.5 Practices of prevention and control of COVID-19

The World Health Organizations (WHO) has declared that preventive measures in instance physical or social distancing, quarantining for those infected or has symptoms and being a close contact to infected person, ventilation of indoor spaces, covering cough and sneezes etiquette, frequent hand washing or hand rubs using sanitizer containing alcohol and keeping unwashed hands away from touch the face (WHO, 2020). Besides, the use of face mask or covering has been recommended in public settings to minimize the risk of transmissions (CDC, 2020). Thus, the Ministry of Health Malaysia (MOH) developed a standard precautions against COVID-19 such as frequently hand wash with soap and water or using an alcohol-based hand sanitizer, wear face mask in crowded places, a social distancing of 2 meters, no mass gathering, when coughing or sneezing must cover the mouth with disposable tissue or flexed elbow, avoid touching eyes, mouth and nose without hand wash first, avoid handshaking, for immunocompromised or has comorbidities individual should stay at home, cannot travel to any area or country that affected with COVID-19 and lastly perform COVID-19 screening and self-isolation at home for 14 days upon returned from overseas (Elongue, 2020)

## 2.6 Introduction of ICU

Intensive care also called as critical care. Patients that have serious illness or injury is that required critical care. In addition, critical care is a medical care for people who have life-threatening injuries and illness (MedlinePlus, 2021). In instance, life-threatening illness or injury included severe burns, heart attack, kidney failure, people recovering from certain major surgeries, respiratory failure, sepsis, severe bleeding, serious infections, serious injuries such as from car crashed, falls and shootings, shock, stroke and COVID-19 infections (MedlinePlus, 2021). Thus, in ICU, the patients will get round-the-clock care by a special trained team. The devices used in ICU is quite advanced than general wards such as blood pressure cardiac output, pulmonary artery wedge pressure and intracranial pressure (Che Mood, 2015)(Jang et al., 2019).

## 2.7 Roles of Nurses in ICU

ICU nurses is also known as critical care nurses (Maria, 2018). Critical care nurses is a registered nurses working in critical care settings, where they provides specialized care of patient whose conditions are life-threatening and required constant monitoring and comprehensive care. They have been educated with extensive knowledge and specialized training (Alberto et al., 2014). They are care for daily essentials of those who are the most vulnerable. They also require to give direct one-on-one ratio care Therefore, they have responsibility for making life and death decisions. Being in critical care setting will exposure them to high risk of injury and illnesses from possible exposure to infections (Krupp et al., 2018) (Gemma Mitchell, n.d.). Next, their communication skill also plays vital part in their efficiency of making instant decisions despite any situations(Crocker, 2007) . As a critical care nurses, these

are a few nursing scope that will be performed such as performing the Airway, Breathing, Circulation, Disability, Exposure (ABCDE) assessment, monitoring patient condition intensively , fulfilling the daily care routine such in instant cleaning and grooming, perineum care and oral care as patient in critical care mostly unconscious, fulfilling essentials nutrition need either via IV, NG tube, or orally, administering medications as prescribed and helping in moral support by give information or updated to relative about patients' condition (Gemma Mitchell, n.d.).

## 2.8 Knowledge, attitude and practices 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) and (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. One study from China found out the nursing staff working in isolation ward has higher knowledge, attitudes and practices score than those in general wards (Wen et al., 2021). In that study, the findings about nursing staff working experiences in terms of KAP showed that those that has $\leq$ 10 years working experiences has lower scored than those with working experiences $\geq$ 20 years (Wen et al., 2021). Hence, the study suggested that it is essentials to take measures to enhance the training on COVID-19 especially for KAP of junior nurses in general wards (Wen et al., 2021).

In Olum et al., 2020 study, among the 136 health co-workers respondents there are 22 respondents is nurse and midwife which make about 16% of the study findings. About sixty-nine percent (n = 94) of the participants scored sufficient knowledge, others is average and only two participants scored below 50% of the knowledge which is considered less knowledge (Olum et al., 2020). As for attitudes scores, only 21% (n = 29) of the participants had a good attitudes toward COVID-19. Hence, only 44% (n = 60) were confidently to participate in the management of COVID-19 patient (Olum et al., 2020). The findings in this study found that there was no statistically significant correlation between attitude and the sociodemographic variable (sex, age, hospital, qualification, and level of education) at ($p < 0.05$). According to this study, about 54% (n = 74) of the participants always practices wore mask when it comes into contact with patients and up to 96% (130) will wash their hands before and after touching each patients (Olum et al., 2020). However, 60% (n = 81) of the participants had avoided patients with the symptoms similar to COVID-19 patients (Olum et al., 2020). Overall, up to 74% (n = 101) of the participants had good practices. It is also recorded in the study that age ≥ 40 and HCWs with diploma were significantly ($p < 0.05$) more likely to have good practices.

Next, this study conducted at a central institute of psychiatry, Ranchi, India where 235 healthcare workers consisting nurses, ward attendants, and housekeeping staff that participated (Mahato & Suryavanshi, 2020). The findings stated that about 79.42% of the participants had adequate knowledge of COVID-19 symptomatic, transmission, management and preventive measures (Mahato & Suryavanshi, 2020). Then, about 35.32% of the respondents have fear to work in a hospital while on the other hand, 80. 85% of the healthcare staff considered coming to work as part of their duty (Mahato & Suryavanshi, 2020). As for practices, the healthcare workers in the

study population have good practices in instance wearing a mask before leaving home and practicing proper hand hygiene were observed by the researchers (Mahato & Suryavanshi, 2020). Hence, this study has given recommendations that paying good attention is essential towards the training of the healthcare workers to enhance their knowledge and attitude as it will improved their practices.

The study related to current study was also conducted in northern Ethiopia during COVID-19 outbreak among nurses (Tadesse et al., 2020) A total of 415 nurses has participated in the study. The findings stated that 307 participants which is 74 % had good knowledge regarding COVID-19 (Tadesse et al., 2020). 67% of the respondents which is 278 nurses has good infection prevention practice (Tadesse et al., 2020). As for favourable attitudes towards COVID-19 cases, there are only 299 nurses which is 72% of the participants acknowledge from the study findings.

Another research from Ethiopia, Northwest region also reviewed in this current study as it relate to the research topic. There are 166 nurses has participated in the study. About 84.9% from the participants had good knowledge and 63.3% of the participants has favourable attitude about COVID-19 based on the research findings (Feleke et al., 2021). It has stated in this study that wearing general medical masks that can prevent one from acquiring infection by the COVID-19 virus were factors in association with the knowledge of nurses on COVID-19 (Feleke et al., 2021).

Next, related research in Saudi Arabia with 957 respondents among healthcare workers where nurses constituted 87.3% of the participants. The mean score for healthcare workers' knowledge about COVID-19 was 9.89 out of 12 (Temsah et al., 2021). By using measurement on a 5-point Likert-like scale, the mean score for healthcare workers' attitude toward infection control is $4.42 \pm 1.1$ (Temsah et al., 2021).

These findings showed that most of the participants are agreed or strongly agreed with the level of importance of implementing their hospital Infection Prevention Control (IPC) (Temsah et al., 2021). While, the mean score for hygiene practice was 3.8 ± 0.32 which represented a moderate to large change in self-rated compliance with hygiene practices and behaviour such as hand hygiene (Temsah et al., 2021).

Then, a researcher about KAP among healthcare workers in Nigeria also reviewed in this study as nurses also a healthcare worker. The findings in the study obtained the mean knowledge score of the respondents was 7.1 on the scale of 0-8. The correct overall rate of the knowledge questionnaire was 88.75% (Ejeh et al., 2020). In the study, 35.0% of the participants gained knowledge from television and social media. The mean attitude score on a scale of 0-6 was 5.31 ± 0.39 (Ejeh et al., 2020). As a precautionary measures against SARS-CoV-2 infection, a vast majority of the respondents responded with practices avoiding crowded places (94.2%), washing of hands (96.0%) and the use of personal protective equipment (91.6%) (Ejeh et al., 2020). However, according to research findings only 3 to 5 respondents responded used a face mask when leaving home (Ejeh et al., 2020). In this research, it is stated that there was a significant (p ¼ 0.046) positive correlation (0.584) between knowledge and attitude.

Another research conducted in occupied Palestine territory (OPt), among nurses' KAP toward COVID-19 by Ramzi, 2021. In this study, a total of 455 nurses has participated. The mean of knowledge, attitude and use of protective measures scores were 75.7% (SD: 12.4%), 75.1% (SD: 17.7%), and 91.6% (SD: 18.2%) respectively as the findings in the study (Shawahna, 2021b). In conclusion, the results of this research indicated that nurses in the oPt had a high level of knowledge, a positive attitude and employed COVID-19 protection measures appropriately during the ongoing pandemic (Shawahna, 2021b). It is suggested in the study that nurses' knowledge, attitude, and

usage of preventive measures should all be updated as new information becomes available during the current pandemic. Noted that more work needs to be done to safeguard healthcare workers notably nurses, from contracting COVID-19. Besides that, the studies also recorded female (p-value = 0.004) and self-rating social status as high (p-value = 0.005) were found to predict high knowledge in multiple linear regression models. Next, the study found that female (p-value = 0.005), self-rating scholastic achievements as high (p-value = 0.007), and having contracted COVID-19 (p-value = 0.001) all indicated a positive attitude. Self-rating academic achievements as high (p-value = 0.010) indicated a higher usage of preventative measures are the result from this study.

In addition, research in Philippines is about the relationship between quality of nursing work life (QNWL) and uniformed nurses' attitudes and practices related to COVID-19 also reviewed for this study. The study findings stated that a total of QNWL scores were high, showing that respondents had positive attitudes and practices toward COVID-19 (Navales et al., 2021). According to the study, QNWL, specialised certification, and COVID-19 practices were found to have a statistically significant association (Navales et al., 2021). In the study also recorded that the total QNWL scored was quite high as more over half the uniformed nurses were single young people. This showed that these categorise are committed to their organisations and content with their working conditions, as seen by their scores. In addition, in this study, work design was a strong predictor of QNWL, implying that nurses were happy with their jobs, had enough help, had enough time to complete their tasks and were confidence in their capacity to give high-quality care to their patients (Navales et al, 2021).

Last but not least, a research conducted among 311 Lebanese nurses in Lebanon about KAP towards COVID-19 stated that majority of the respondent had sufficient

knowledge of COVID-19 (Saadeh et al., 2021). 68% of participants declared that they fear of getting infected while 90% of respondents were afraid for their family members to get infected due their occupational exposure (Saadeh et al., 2021). For practices toward COVID-19, 84.6% of nurse respondents declared employed infection prevention and control precautions (Saadeh et al., 2021). Findings showed that nurses in Lebanon have a satisfactory level of knowledge about COVID-19 (Saadeh et al., 2021).

## 2.9 Theoretical and Conceptual Framework of the Study

Knowledge, Attitude and Practices (KAP) framework will be used in this study. In the 1950s, KAP theory is originated used in the domains of family planning and population research (Andrade et al., 2020). These are now widely accepted for the research of health-related behaviours and health-seeking practises. KAP are also known as knowledge, attitude, behaviour and practise surveys. A KAP survey tries to elicit what is known (knowledge), believed (attitude), and practised (practiced) in the context of issue of interest (Andrade et al., 2020). In my study it will be about the knowledge of COVID-19, nurses that worked in intensive care unit attitude toward COVID-19 and their practices on preventing and infection control of COVID-19. Designing, conducting, analysing and interpreting KAP survey is quite simple.

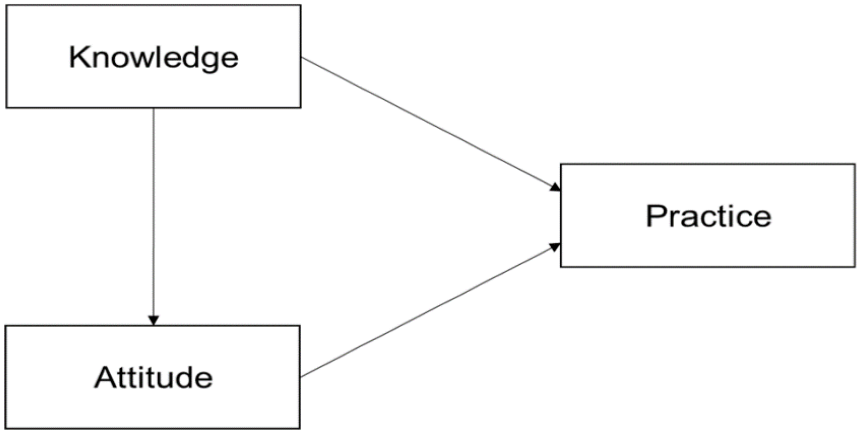


Figure 2.1 the KAP Model (Andrade et al., 2020)

In this study, the researcher wants to determine the correlation in knowledge, attitude, and practices toward COVID-19 among ICU nurses in Hospital USM. Hence, the KAP model for this study focused on the knowledge first, then its association with attitudes and practices. Figure 2.2 will illustrate the KAP model corresponding to this study.

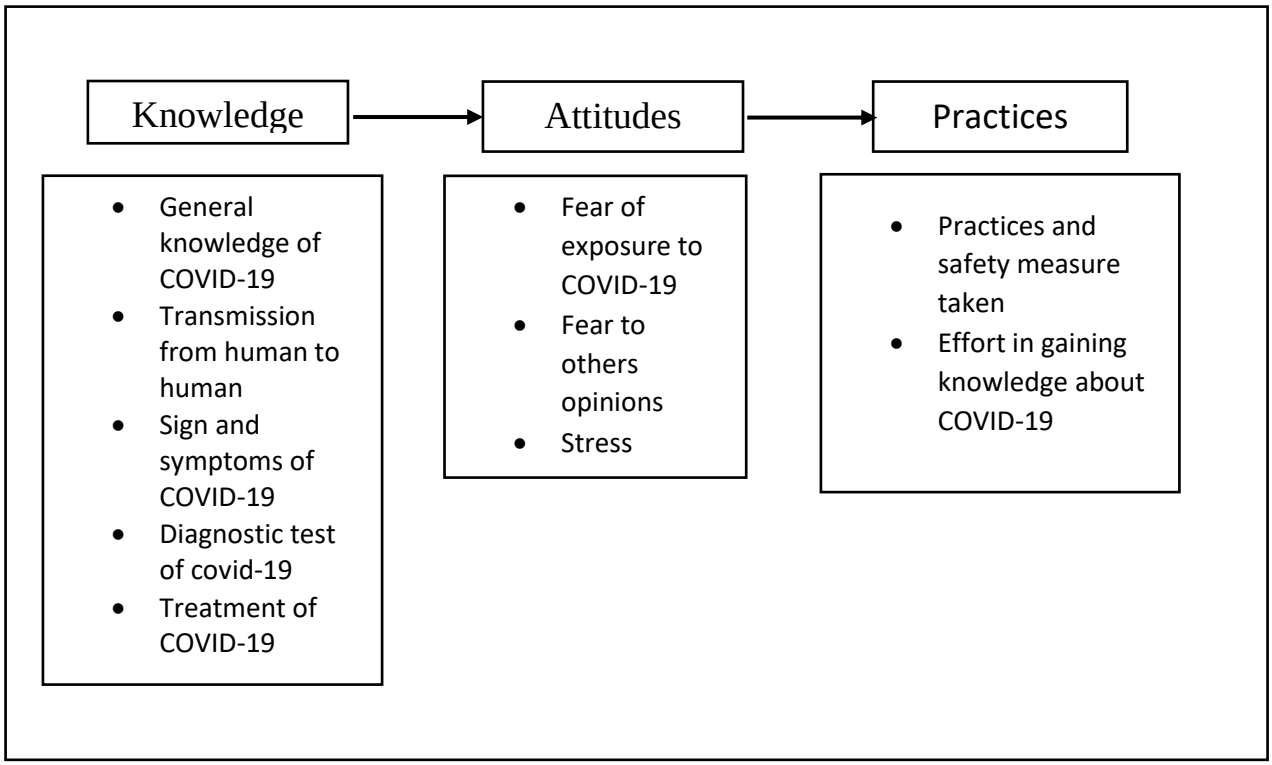


Figure 2.2 The KAP toward COVID-19 among ICU nurses in Hospital USM

# Chapter 3: Research Methodology

## 3.1 Introduction

This chapter will discuss and justify the research methodology's strategy and justification. The appropriate selection of a research design and understanding will help to accomplish the purpose of the study. The first section of this chapter justifies using a cross-sectional study design in this research. Next, the chapter continues with a description of the study setting, population, and sample plan. The sample plan included the selection of criteria for participants, sampling process, and sample size estimation. The instrumentation and ethical considerations in the study will be addressed through appropriate data collection. The recommended statistical analysis for the quantitative data will be explained in the concluding portion of this chapter.

## 3.2 Research Design

This study is a cross-sectional study. Cross-sectional studies have helped a researcher collect sufficient information quickly and allow a researcher to obtain data inexpensively using an online questionnaire. Thus, this study aimed to analyze the knowledge, attitude, and practices on COVID-19 among ICU nurses in Hospital USM.

## 3.3 Research Location

The study was conducted in intensive care unit wards which involved 1 Mutiara (General ICU), 1 Nilam (Neonate ICU), Surgical ICU and Trauma ICU at Hospital USM, Kubang Kerian, Kelantan, Malaysia. Those wards are the special wards for severely ill patients who are kept under constant observation. (Department of Anaesthesiology, 2021)

## 3.4 Research duration

This study was conducted after permission granted by HREC, Director of Hospital USM and the Head of Nursing department in Hospital USM. The data was collected and analyzed from March 2022 until June 2022.

## 3.5 Research population

This study was conducted among nurses that worked in ICU wards at Hospital USM, Kubang Kerian, Kelantan, Malaysia. These respondents are chosen as the participants criteria as they are the nurses that will perform the nursing care towards critically ill patients admitted to ICU.

## 3.6 Subject criteria

### 3.6.1 Inclusion Criteria

Participants must meet the following criteria to be included in the study:

i. Nurses working in ICU wards at Hospital USM.

### 3.6.2 Exclusion Criteria

Subjects are excluded from the study if they are fulfilling one of the following:

i. Nurses management such as Sister, Matron and Chief Matron.

ii. ICU nurses that are in prolonged leave during the data collection.

## 3.7 Sampling Plan

In statistical analysis, sampling is the process of selecting responses from large population (Piaw, 2016) Sampling ensure that the sample chosen is representative of the

population being investigated, improving the validity and reliability of the study (Piaw, 2016) This will minimised the measurement mistakes (Piaw, 2016)

### 3.7.1 Sample Size Estimation

Total population of intensive care unit nurses in 1 Mutiara (General ICU), 1 Nilam (Neonate ICU), Surgical ICU and Trauma ICU at Hospital USM is 167 nurses. The sample size was estimated using a single proportion formula;

$$n= (z/\Delta)^2 p (1-p)$$

Where z = z value (1.96% for 95% confidence interval),

$\Delta$ = level of significant (0.05%),

P = anticipated population proportion (95%, 0.5)

Using Raosoft, Inc. online sample size calculator:

n = 117 participants

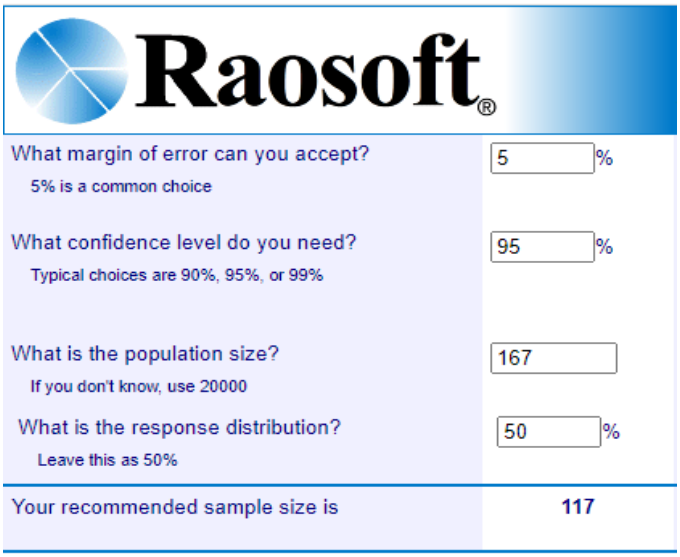


Figure 3.1 : Sample size calculation by using Raosoft Software.

The margin error that can be accepted is 5% with the confidence level of 95% while the response distribution is 50%. Thus the recommended sample size for this study is 117 participants. However, sample size estimated changed after include the drop out of this study which is 10% of the calculated sample size. Therefore, the total of participants required for this study are as follows:

Total of the participants = 117+ drop out of 10%

= 117 + 11.7

= 129 participants

Thus, the sample size estimation is 129 out of 167 nurses.

For objective 2, the sample size was estimated by using the Pearson's correlation from the sample size calculator (web) by Arifin (2022). The sample size calculation using the r-value for correlation between knowledge and practice against COVID-19 among nurses from the previous study by Shawahna (Shawahna, 2021) which r is 0.27. The sample size estimated is 117 participants with 10% dropout as shown in Figure 3.2. While the sample size calculation using the r-value for correlation between attitude and practice against COVID-19 among nurses from the previous study (Shawahna, 2021) is 0.13. Then, the sample size estimated is 514 participnats with 10% dropout as shown in Figure 3.3.

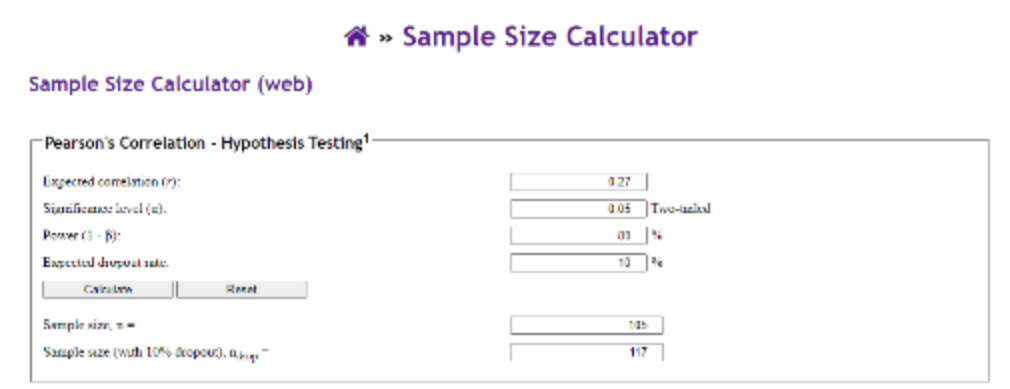


Figure 3.2 Sample size calculation correlation between knowledge and practices against COVID-19

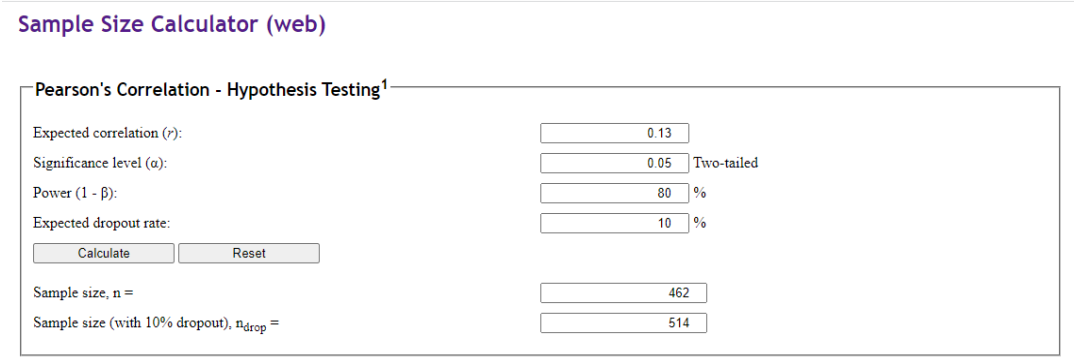


Figure 3.3 Sample size calculation between attitude and practices against COVID-19

For objective 3, the sample size was estimated using the Pearson's correlation calculation. The r-value in calculation is 1.0 as the positive correlation between the social characteristics (age, gender, place of work, qualification and level of education) and the level KAP of COVID-19 as in previous study (Shawahna, 2021). The sample size estimated is 4 participants with 10% dropout as shown in the Figure 3.4.