Knowledge, Attitude, Practice, Perception, and Psychological Response of Nurses Regarding Covid-19; Literature Review

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A B S T R A C T

COVID-19 is a disease caused by a new corona virus resembling pneumonia and first appeared in China's Wuhan Province in November 2019. Nurses play an important role in health care settings, including prevention, infection control, isolation, continuous patient monitoring, and have occupational risk as well as high risk of exposure in providing care during the COVID-19 outbreak. The purpose of this literature review is to identify nurses' knowledge, attitudes, practices, perceptions, and psychological responses to COVID-19. This research method is a literature review. Search for articles using six databases namely PubMed, Ebscohost, Chocrane Library, ClinicalKey for Nursing, Science Direct, and Gray Literature using keywords based on PICO. There are 1,149 articles identified from 2019-2021, was found 21 relevant articles that were discussed and analyzed. Results: The majority of nurses had a good level of knowledge, had positive attitudes, good practices, and positive perceptions of COVID-19. Nurses are experiencing stress and psychological responses during the COVID-19 pandemic. Conclusion: The majority of nurses have a good level of knowledge, but there are still nurses who have less knowledge about diagnosis, prevention, treatment and control of COVID-19 infection, besides that nurse also experience psychological responses such as anxiety and depression related to COVID-19.

A B S T R A K

COVID-19 merupakan penyakit yang disebabkan oleh virus corona baru menyerupai pneumonia dan pertama kali muncul di Provinsi Wuhan China pada November 2019. Perawat memainkan peran penting dalam pengaturan perawatan kesehatan, diantaranya pencegahan, pengendalian infeksi, isolasi, pemantauan pasien secara berkelanjutan, memiliki risiko pekerjaan, dan risiko paparan yang tinggi dalam memberikan perawatan selama wabah COVID-19. Tujuan tinjauan literature ini untuk mengidentifikasi pengetahuan, sikap, praktik, persepsi, dan respon psikologis perawat terhadap COVID-19. Metode penelitian ini adalah literature review. Pencarian artikel menggunakan enam data base yaitu PubMed, Ebscohost, Chocrane Library, Clinical Key for Nursing, Science Direct, dan Gray Literature menggunakan kata kunciberdasarkan PICO. Ditemukan 1.149 artikel dalam rentang waktu tahun 2019-2021, dan ditemukan 21 artikel yang relevan untuk di bahas dan dianalis. Hasil: Mayoritas perawat memiliki tingkat pengetahuan yang baik, memiliki sikap positif, praktik yang baik, dan persepsi positif terhadap COVID-19. Perawat mengalami stress dan respons psikologis selama pandemi COVID-19. Kesimpulan: Mayoritas perawat memiliki tingkat pengetahuan yang baik,

namun masih terdapat perawat yang memiliki pengetahuan kurang tentang diagnosis, pencegahan, pengobatan dan pengendalian infeksi COVID-19, selain itu perawat juga mengalami respon psikologis seperti kecemasan dan depressi terkait COVID-19.

INTRODUCTION

COVID-19 is a disease caused by a new corona virus resembling pneumonia that appeared in the Wuhan Province in China in November 2019 (Labrague & De los Santos, 2020), and was declared as a pandemic by the World Health Organization (WHO) on March 11, 2020 (WHO, 2020). Globally cases of COVID-19 it keeps going up, as of June 05, 2021 as many as 173,318,470 confirmed cases, recovered 156,059,410 people, and died of 3,727,283 people, in Indonesia the number of confirmed cases is 1,843,612 people, 1,697,543 recovered, and 51,296 people have died (Worldometer, 2021).

Increasing cases of covid 19 has led to an increase demand for health care. The nurse as a health worker with the largest number in the world with around 20 million nurses (The Lancet, 2019), nurses play an important role in health care settings in prevention, infection control, isolation, sustainable patient monitoring, are unique in facing patient and risk jobs and the possibility of occupational exposure is relatively higher in providing care during an outbreak COVID-19 (Smith & Li, 2020). Therefore, a good knowledge of COVID-19, a positive attitude, and good behavior is needed in terms of taking steps to prevent being infected with COVID-19.

Infection control nurses are influenced by the knowledge, attitudes, practices, and their psychological response to COVID-19 (Tadesse et al., 2020). During the pandemic period COVID-19 as perawatjuga have close contact with infected patients, and is a major part of the chain of transmission of infection (Nemati et al., 2020). This condition causes anxiety for nurses, they feel anxious because caring for infected patients and worry that they can transmit the infection to themselves and their families. Anxiety related to the COVID-19 pandemic is usual among nursing workers, potentially affecting the welfare and performance of nurses (Labrague & De los Santos, 2020).

Some research about knowledge, attitudes, behavior and perceptions have been carried out such as research in Vietnam where the majority of respondents were nurses (70.9%) concluded that the majority of respondents had good knowledge and positive attitudes towards Covid-19, however, their level of knowledge and attitude was lower than expected for their level of position against the virus (Giao et al., 2020). Another study conducted in Bangladesh reported that most respondents had poor knowledge about transmission and onset of symptoms and displayed positive perceptions about prevention and control of COVID-19 (Farhana & Kazi Abdul Mannan, 2020). Moreover research about anxiety, depression, and nurses' fear of COVID-19 has also been carried out, the results showed that each nurse reported moderate to high levels of anxiety, depression, and fear (Hu et al., 2020). Other studies have reported that nurses have a dysfunctional anxiety during a pandemic COVID-19 (Labrague & De los Santos, 2020).

The fight against COVID-19 will continue on a global scale. Accordingly, knowledge about prevention and control of COVID-19 is very important for nurses as frontline officers who are fighting the pandemic. And enable them to provide better care to patients and protect themselves (Huang et al., 2020).

Considering the important role of nurses in handling COVID-19 cases, so it is important to discuss and analyze it completely in this literature review. Some previous reviews have been conducted to assess knowledge, attitudes, and practices. Several previous reviews have been conducted to assess knowledge. Among them, on knowledge, attitudes and practices towards COVID-19 among health professionals in Ethiopia: A systematic review and meta-analysis (Lake et al., 2021). A review of knowledge, attitudes, perceptions and practices towards COVID-19: A systematic review and meta-analysis that focuses on the general population, healthcare workers, medical students and people with chronic diseases (A. S. Bhagavathula et al., 2020). While in our review we had add a psychological response variable and more specifically for nurses. The purpose of this literature is to identify knowledge, attitudes, practices, perceptions, and psychological responses of nurses to COVID-19.

METHOD

The design used in this literature is the literature review. Literature reviews are obtained through searching the results of scientific publications in the period 2019-2021, by using a search of six databases, namely PubMed, Ebscohost, Chocrane Library, ClinicalKey, Science Direct, and Gray Literature using keywords based on the PICO / Patient method, Intervention, Comparison and Outcome (Brandt Eriksen & Faber Frandsen, 2018).

Each database using keywords such as; Nurses OR nursing and covid-19 OR SARS-CoV-2 OR novel corona virus and knowledge OR attitude OR practice OR KAP OR perception OR anxiety OR psychological response OR psychological stress. Based on the screening results, it was found that 21 articles met the inclusion criteria and were relevant to the research question (Figure 1). The inclusion criteria of this literature review are (1) the respondent is a nurse, (2) a cross-sectional descriptive survey study, (3) the measured results are knowledge, attitudes, practices, perceptions, anxiety, and psychological responses. While the exclusion criteria were (1) study of non-English publications (2) duplication studies (3) articles that were not in accordance with the research question, (4) not full text, (6) articles that were not open, and (7) articles that were not appropriate with research results.
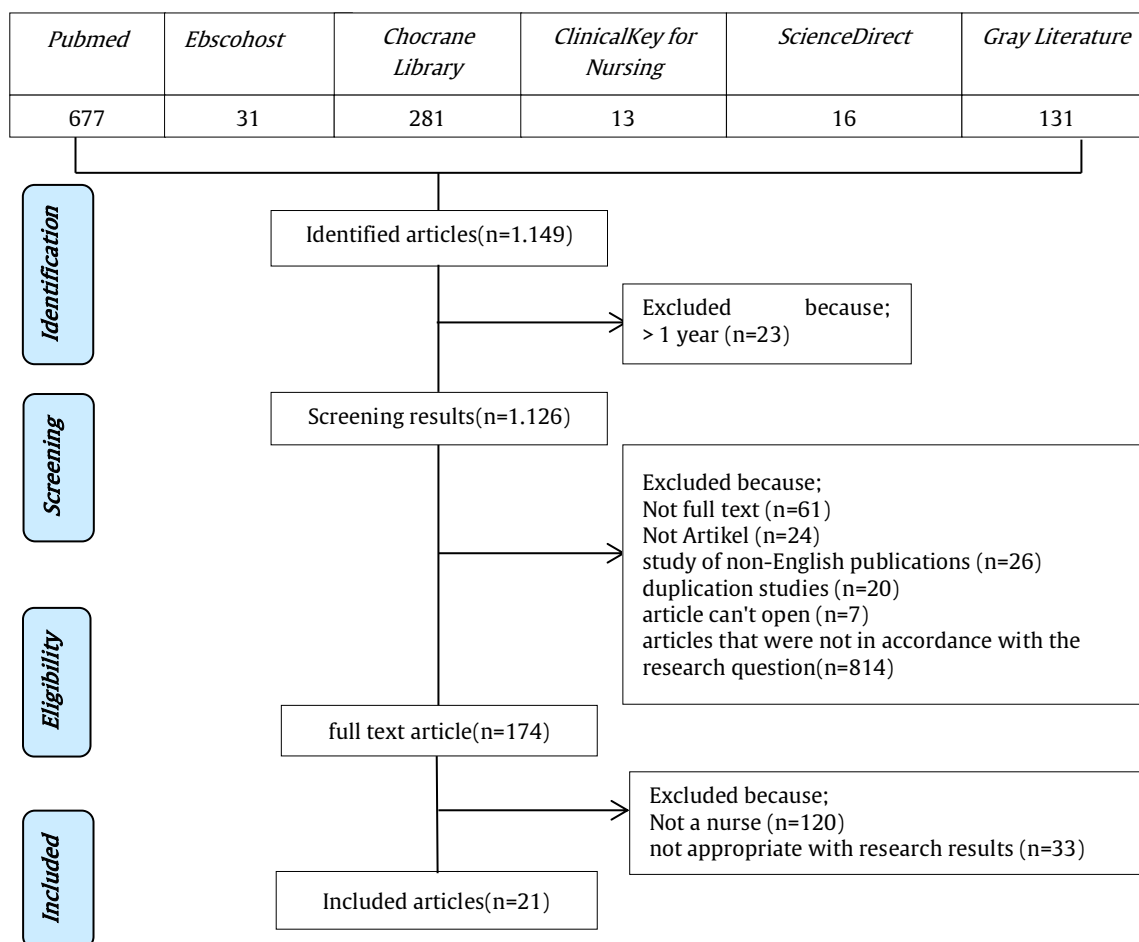
Pubmed	Ebscohost	Chocrane Library	ClinicalKey for Nursing	ScienceDirect	Gray Literature
677	31	281	13	16	131

Identification

Identified articles(n=1.149)

Excluded because;
> 1 year (n=23)

Screening

Screening results(n=1.126)

Excluded because;
Not full text (n=61)
Not Artikel (n=24)
study of non-English publications (n=26)
duplication studies (n=20)
article can't open (n=7)
articles that were not in accordance with the
research question(n=814)

Eligibility

full text article(n=174)

Excluded because;
Not a nurse (n=120)
not appropriate with research results (n=33)

Included

Included articles(n=21)

Figure 1: Diagram of flow for inclusion and exclusion of studies

RESULTS AND DISCUSSION

Based on the results of the literature search found 21 articles (Table 1) generally assessed the knowledge, attitudes, practices, perceptions, anxiety, and psychological responses of nurses related to COVID-19. Four articles were found in China (Chen et al., 2020; Huang et al., 2020; Jin & Yi, 2020; Li et al., 2020), two in Arabian (Al-Dossary et al., 2020; Alreshidi, 2020), two in India (Adhikari et al., 2020; Patidar et al., 2020), one in Nepal (Kafle et al., 2020), three in Turkey (Aydin & Balci, 2020; Gumus & Basgun, 2020; Semerci et al,2020), one in Northern Ethiopia (Tadesse et al., 2020), two in Pakistan (Alwani et al., 2020; Zafar et al., 2020), one in Iran (Nemati et al., 2020), one in Lebanon (Saadeh et al.,2020), one in Ghana (Buertey et al., 2020), one in Indonesia (Sahar et al., 2020), one in Bangladesh (Saha, et al, 2020), and one in Egypt (Goda Elbqry, 2020). The number of samples between 85-1.323 nurses, using a questionnaire as an instrument, the study used a cross-sectional study.

Knowledge about COVID-19

There were 20 articles about nurses' knowledge related to COVID-19, including; research in Wuhan China, of 1,323 nurses working in designated hospitals for COVID-19, non-designated hospitals, and Fangcang shelter hospital in Wuhan, showed nurses had a good understanding of the population that was susceptible to COVID-19 (76.9%), isolation ward layout and procedures (70.5%), environmental cleaning and disinfection (60.7%), hand hygiene measures

(71.0%), reporting cases of infectious diseases (78.3%), standard precautions (61.9%), and the level of self-protection (69.7%). However, nurses have insufficient knowledge about the transmission route (23.7%), use of PPE (19.6%), patient management (40.7%), disposal of medical waste (19.1%), and occupational exposure emergency response (28.6%). The level of knowledge of nurses has an effect on attitudes, and title, workplace, and attitudes have an impact on their practice (Jin & Yi, 2020).

Research in Saudi Arabia, with a number of respondents with 527 nurses, showed that nurses' knowledge of COVID-19 got a score of 89%-98% (Alreshidi, 2020). Research in India, of 380 novice nurses working in COVID-19 units, shows that a large number of participants are sufficiently aware of the basic elements of COVID-19, namely etiological factors, incubation period, clinical symptoms, transmission, prevention, and treatment (Patidar et al., 2020). Research in Nepal, with a number of respondents with 750 nurses, shows that most respondents have a moderate level of knowledge (44.8%), followed by a low level of knowledge of respondents (29.2%) and the rest (26.0%) had good knowledge about COVID 19 (Kafle et al., 2020).

The research in Turkey, about 185 nurses showed that more banyakperawat oncology have good knowledge tentangCOVID-19, and following the COVID-19 guidelines affected their level of knowledge about COVID-19 by 29.1% (Semerci et al., 2020). Research in Northern Ethiopia, about 415 nurses showed 307 (74%) have a good knowledge

(Tadesse et al., 2020).Penelitian in Pakistan, about 78 nurses who are directly involved in the management of patients COVID-19, shows that the nurse has a good knowledge of COVID-19, its source, symptoms and transmission route, etc. The main sources of information regarding COVID-19 are the Department of Health / Hospitals and social media (Alwani et al., 2020).

Research in Iran with 85 nurses as respondent, shows that more than half of nurses (56.5%) have good knowledge about the source, transmission, symptoms, signs, prognosis, treatment, and mortality rate of COVID-19. Sources of information for nurses are the World Health Organization and the Ministry of Health (55.29%), social applications (48.23%), and media (42.35%) (Nemati et al., 2020). Research in China to 979 staff nurses, indicating that they do not have adequate knowledge about the standard for viral nucleic acid tests respectively (38.7%), isolation/discharge discharge criteria (55.1%), and management measures for patients with suspected symptoms (72.8%), this reflects that the nursing staff's knowledge of COVID-19 prevention and control is lacking. There are a statistically significant difference in scores between different nurse roles, work experience, and the hospital where they work (Huang et al., 2020). A study in Lebanon of 311 nurses, showed that the majority of nurses had sufficient knowledge about COVID-19 (Saadeh et al., 2020).

Research in Pakistan to 384 nurses, showing nurses had moderate knowledge, 49% of nurses answered correctly that COVID-19 is an infectious disease. Total of 60.7% answered correctly that COVID 19 cases classified into mild, moderate, and severe cases. 81% of respondents answered that the diagnosis criteria for COVID-19 patients were travel history (Zafar et al., 2020). Research in Saudi Arabia, respondents were 500 nurses, showing that the majority of nurses (96.85%) had very good knowledge of COVID-19, some nurses (83.2%) reported significant prevention knowledge and treatment skills about COVID-19, while 7.6% had little knowledge about prevention (Al-Dossary et al., 2020). Research in Ghana of 196 nurses / midwives, showed that nurses / midwives had adequate knowledge about the corona virus (SARS-CoV 2) (Buertey et al., 2020).

Research in Indonesia, about 368 nurses PHN, showed a majority of participants (77.4%) had a good knowledge of COVID-19. Factors related to knowledge are the source of information. There is a significant positive linear correlation between knowledge and attitudes, knowledge and practice, as well as attitudes and practices (Sahar et al., 2020). Research in Bangladesh, as many as 380 nurses, showed that 73.42% of nurses had good knowledge, 17.63% of nurses had knowledge is sufficient and 8.95% have poor knowledge about prevention and control of COVID-19 infection (Saha et al., 2020). A study in India, of 315 nurses in tertiary care hospitals, showed that out of 315 nurses, 62.2% had undergone related training.COVID-19. Knowledge relating to the clinical features, modes of transmission, and the incubation period was satisfactory, while knowledge related to diagnosis, treatment, and vaccines for the disease was less (56.2%) (Adhikari et al., 2020).

Research in China, of 237 interns during the COVID-19 epidemic, interns had good knowledge about the origin and prevention of COVID-19 (percentage correct >94%), but insufficient knowledge about treatment and incubation (percentage correct <10 %) (Chen et al., 2020). Research in Turkey, the number of respondents was 279 operating room nurses; this study shows that operating room nurses have a high level of knowledge about most of the preventive measures for COVID-19. The "yes" response rate given by operating room nurses to statements on preventive practices for protection against COVID-19 was found to be between 10%-98.6% while the "no" response rate was found to be between 0% -25.8%. he rate stating that they do not have an opinion about the statement was found to be between 1.8% and 48.4% (Gumus & Basgun, 2020). Research at the Suez Canal University Hospital Quarantine Hospital, Egypt, of 183 nurses, showed that the nurses studied had a satisfactory level of knowledge. Moreover, here is a significant relationship between the level of knowledge of nurses and the psychological stressors of COVID-19 (Goda Elbqry, 2020).

Research in Turkey, of 123 nurses during the COVID-19 outbreak, showed that 89.43% of nurses working in Afyonkarahisar Health Sciences University Medical Faculty Hospital had extensive knowledge of COVID-19 and 73.17% received relevant training in the hospital. 75.6% have detailed information about the structure of the virus, 97.6% has detailed information on the common symptoms of COVID-19 infection and how to protect you self from the disease. 91.1% of the participants believed they were in the risk group for this infection and 79.1% believed that success could be achieved against this infection. Moreover, 66.7% of nurses who participated in this study showed a history of contact with patients with suspected or confirmed COVID-19 virus (Aydin & Balci, 2020).

Attitudes regarding COVID-19

There were 11 studies on nurses' attitudes related to COVID-19, research in Wuhan China, this study showed nurses had positive attitudes towards self-protection, hand hygiene, pre diagnosis and triage, patient management, and training on infection in hospitals, applying practical precautions such as the use of proper PPE, strict hand hygiene measures, setting up fever clinics, isolation wards, and designated hospitals. However, this research shows a mismatch between attitudes and practices in standardized prevention measures, proper ward division, strict environmental disinfection, proper disposal of medical waste, and occupational exposure emergency response (Jin & Yi, 2020).Research in Saudi Arabia, nurses show a cooperative attitude in fighting the virus, 87% of nurses adapt to an open learning attitude to get more information about the virus (Alreshidi, 2020). Research in Turkey showing that as many as 299 (72%) nurses have a good attitude towards COVID-19 (Tadesse et al., 2020).

Research in Pakistan, findings show nurses have a positive attitude towards COVID-19 (Alwani et al., 2020).Research in Lebanon, reported that 62% of nurses expressed fear of being infected while 90% feared their family members were infected due to their occupational exposure (Saadeh et al., 2020). Research in Pakistan, nurses showed a positive attitude regarding COVID 19 (Zafar et al., 2020). Research in Saudi Arabia, more than half of nurses (60.4%) have a high positive attitude towards the care of COVID-19 patients (Al-Dossary et al., 2020).Research in Ghana, nurses generally show a good attitude towards preventing COVID-19 (Buertey et al., 2020). Research in Indonesia, the majority of nurses has a positive attitude towards COVID-19 with an average score of 33.0 ± 2.7. Factors related to attitudes are gender, work experience, and sources of information (Sahar et al., 2020).

Research in India, shows that around 94% of nurses agree / fully agreed that hand washing, use of N95 masks, and universal precautions are effective in preventing infection of the novel corona virus, 98% of nurses felt that the government should provide life insurance protection to

health workers, 95.2% stated that they were willing to provide care to COVID-19 patients, Attitude scores were seen in 231 (73.3%) nurses. Regression analysis showed higher education, training on COVID-19, and higher knowledge scores had a significant effect on attitude scores (Adhikari et al., 2020). Research in Egypt, on 183 nurses, the majority of them have a positive attitude (98%) (Goda Elbqry, 2020).

Practice related to COVID-19

There are nine studies on nursing practice related to COVID-19, including; research in Wuhan China, the study results show nurses have good practices in personal protection, hand hygiene, pre-diagnosis and triage, patient management, and training on infection in hospitals, implementing practical precautions such as proper use of PPE, strict hand hygiene measures, established fever clinics, isolation wards, and designated hospitals. However, this research shows a mismatch between attitudes and practices in standard precautionary measures, proper ward division, strict environmental disinfection, proper disposal of medical waste, and occupational exposure emergency response (Jin & Yi, 2020). Research in Turkey showed as many as 278 (67%) nurses have good infection prevention practices (Tadesse et al., 2020).

Research in Pakistan, the results of the study observed that nurses follow the correct protocol to prevent themselves and patients, about 80% of nurses wear masks, protective clothing, place suspected patients in a single room that is ventilated, routinely clean and disinfect environmental surfaces, often clean hands and follow respiratory hygiene and cough etiquette and practice social distancing (Alwani et al., 2020). Research in Lebanon, the majority of nurses (84.6%) stated that following the infection prevention and control (Saadeh et al., 2020). Research in Pakistan, the nurse reflects good practice related COVID 19 (Zafar et al., 2020).

Research in Ghana, nurses show that the level of preventive practice has been recorded to be good (Buertey et al., 2020). Research in Indonesia, of 368 PHN nurses, nurses had good practices related to COVID-19, factors related to practice were gender, and resources (Sahar et al., 2020). Research in Bangladesh, 73.42% of nurses have good practice, 21.84% moderate practice, and 8.68% bad practice, there is a significant relationship between knowledge and practice of nurses (Saha et al., 2020). Research in Egypt, findings showed that the nurses studied had satisfactory practices related to COVID-19 (Goda Elbqry, 2020).

Perceptions regarding COVID-19

Two studies were found related to nurses' perceptions of COVID-19, namely; A research in India of 380 novice nurses working in COVID-19 units showed that the majority (52.89%) of novice nurses had positive perceptions of COVID-19 (Patidar et al., 2020). Research in Saudi Arabia, showed that more than half of nurses 346 (69.2%) had a very high positive perception of COVID-19 (Al-Dossary et al., 2020).

Psychological Response related COVID-19

Eight studies were found related to the psychological response of nurses to COVID-19 including anxiety and depression during the COVID-19 pandemic including; Research in Saudi Arabia, shows that nurses experience anxiety, the two main reasons causing the most anxiety are knowing that they are positive for COVID-19 and should be placed in an isolation ward (96%). They are also worried about the government's ability to fight the virus and the availability of resources to continue the protracted fight against the virus (94%) (Alreshidi, 2020).Research in Turkey shows that as many as 354 (85.3%) nurses experience impaired psychological responses to COVID-19 (Tadesse et al., 2020). Research in Pakistan, showed that as many as 6 (7.7%) nurses experienced mild anxiety, 19 (24.4%) moderate anxiety, 24 (30.8%) high anxiety, and 23 (29.5%) nurses experienced very severe anxiety, and the level of anxiety was significant higher among women (Alwani et al., 2020).

Research in Iran, showed anxiety for themselves and their families with COVID-19 (Nemati et al., 2020).Research in Iran, shows that the psychological damage suffered by nursing staff is mild with an average total TAF score of 7.0 (IQR 5.0-12.0), there is a statistically significant difference in the total TAF score and the individual domain scores between different categories of personnel., years of work experience, and department (Huang et al., 2020). Research in China to 237 nurse interns during the COVID-19 epidemic, the average anxiety scores of 237 nurse interns surveyed did not differ significantly from the norm in China. However, their average depression score was lower than the Chinese norm. However, no statistically significant differences in anxiety or depression were found between the demographic subgroups. The most common way for interns to seek help is by asking instructors or other medical professionals (89.45%). If the interns have suspected symptoms, they are more likely to go to the hospital for treatment (97.89%) (Chen et al., 2020).

Research in Egypt, more than a third (48.9%) of nurses studied had zero levels of psychological stressors for COVID-19, while less than a quarter (1.6%) had severe levels of psychological stressors. In addition, there was a significant relationship between levels of knowledge nurses with psychological stressors COVID-19 (Goda Elbqry, 2020). Research in Wuhan, China showed that among 176 frontline nurses, 136 (77.3%) experienced anxiety, namely 27.3% mild anxiety symptoms, 25% moderate anxiety symptoms, and 25% severe anxiety symptoms. Gender, age, marital status, years of service, and time of clinical work against COVID-19 were associated with anxiety. Frontline nurses working at the designated hospital for the treatment of COVID-19 in Wuhan are experiencing serious anxiety (Li et al., 2020).

DISCUSSION

Of the 21 studies reviewed, it was found that the majority of nurses had good knowledge of COVID-19, had positive attitudes, good practices, positive perceptions, and experienced psychological responses including anxiety and depression. The results of the analysis show that 15 studies reported that nurses had good knowledge, four studies reported insufficient knowledge, and one study reported lack of knowledge. 10 studies reported positive nurse attitudes, nine studies showed good practice related to COVID-19. This is in line with research Bekele et al., (2020) and research Hesaraki et al., (2020) where the majority of health workers have good knowledge, positive attitudes, and good practices related to COVID-19. However, this is different from the results of research Lake et al., (2021) reporting that health professionals have good knowledge, positive attitudes and bad practices related to COVID-19.

The results of the analysis found that nurses had good knowledge about populations that are susceptible to COVID-19, layout and procedures of isolation wards, environmental

cleaning and disinfection, hand hygiene measures, reporting of infectious disease cases, standard precautions, level of self-protection (Jin & Yi, 2020), sources, symptoms, transmission route of COVID-19 (Alwani et al., 2020; Saadeh et al., 2020), signs, prognosis, treatment, COVID-19 mortality rate (Nemati et al., 2020), most vulnerable people, treatments available to date, PCR testing, quarantine time required for suspected cases of COVID-19, and knowing effective methods and steps to take to protect yourself from infected patients (Saadeh et al., 2020). This is supported by research which reports that the level of knowledge of health workers is very good regarding disease transmission such as close contact with a patient with suspected COVID-19, having sufficient awareness of the definition and source of COVID-19 infection, respondents are aware of the symptoms and how to take precautions for COVID-19 and have awareness of the infection and treatment of COVID-19 (Imdad et al., 2020; Maleki et al., 2020)

Nurses' knowledge of the COVID-19 outbreak directly affects patient outcomes, prevention, and control of COVID-19 infection (Jin & Yi, 2020). Knowledge is a prerequisite for building preventive beliefs, forming positive attitudes, and promoting positive behavior, and individuals' cognitions and attitudes towards disease affect the effectiveness of their strategies and behavior to some extent (Zhou et al., 2020). Nurses' infection control measures can be influenced by their knowledge, attitudes, practices, and psychological responses to COVID-19 (Tadesse et al., 2020).

The results of the analysis found that nurses had a positive attitude regarding self-protection, hand hygiene, pre-diagnosis and triage, patient management, training on infection in the hospital, implementing practical precautions such as proper use of PPE, strict hand hygiene measures, adapting to an open learning attitude to get more information about the virus, nurses agree that washing hands, the use of N95 masks, universal precautions are effective in preventing infection of the novel corona virus, and willing to provide care to COVID-19 patients. Factors related to attitudes are gender, work experience, sources of information (Sahar et al., 2020), higher education, training on COVID-19, and good knowledge have a significant effect on attitudes (Adhikari et al., 2020).

The results of the analysis found that nurses had good infection prevention and control practices (Buertey et al., 2020; Goda Elbqry, 2020; Jin & Yi, 2020; Saadeh et al., 2020; Saha et al., 2020; Sahar et al., 2020; Tadesse et al., 2020; Zafar et al., 2020). Nurses follow the correct protocols to prevent infection of themselves and patients, wear masks, protective clothing, place suspected patients in a ventilated isolation room, routinely clean and disinfect environmental surfaces, frequently clean hands and follow respiratory hygiene and cough etiquette and practice distance social (Alwani et al., 2020). This is in line with research Olum et al., (2020) which reported that respondents have good practices related to COVID-19, research Zhou et al., (2020) found that the majority of respondents followed the correct practices related to COVID-19. Factors related to practice are the type of sex and source of information (Sahar et al., 2020). The analysis also found positive nurses' perceptions regarding COVID-19 (Al-Dossary et al., 2020; Patidar et al., 2020). This is in line with research Farhana & Kazi Abdul Mannan, (2020), and research A. Bhagavathula et al.,(2020) which reported that health workers have positive perceptions regarding COVID-19.

The results of the analysis of anxiety found that nurses experienced anxiety (Alreshidi, 2020), the anxiety experienced by nurses was mild anxiety, moderate anxiety, high anxiety, and very severe anxiety (Alwani et al., 2020; Li et al., 2020). The results of this analysis are in line with research Santabárbara et al., (2021) reporting that health workers experience anxiety during the COVID-19 pandemic. These findings indicate nurses' anxiety for themselves and their families with COVID-19 (Nemati et al., 2020), knowing that they are positive for COVID-19 and should be placed in isolation, worried about the government's ability to fight the virus and the availability of resources to continue the protracted fight against this virus (Alreshidi, 2020). Gender, age, marital status, years of service, and length of work are associated with anxiety (Li et al., 2020). From the results of this analysis, it was also found that nurses experienced disturbed psychological responses during the COVID-19 pandemic (Tadesse et al., 2020). Psychological disorders experienced by nurses are mild (Huang et al., 2020), nurses had zero COVID-19 psychological stressor levels, while less than a quarter had severe psychological stressors (Goda Elbqry, 2020). This is in line with research Chew et al., (2020) which found that health workers experience anxiety, depression and stress during the COVID-19 pandemic. In this review of the literature depression rates for nurses were lower, the most common way for nurses to seek help was to ask an instructor or other medical professional, and if nurses had suspected symptoms, they were more likely to go to the hospital for treatment (97.89%) (Chen et al., 2020).

CONCLUSIONS AND RECOMMENDATION

The majority of nurses have a good knowledge, but there are still nurses who have lack knowledge about the diagnosis, prevention, treatment and control of COVID-19 infection, besides that the nurses also experience psychological responses such as anxiety and depression related to COVID-19. Accurate and current information is needed about COVID-19 and training that encourages increased knowledge, attitudes and practices to reduce this pandemic, as well as to reduce nurses' psychological responses such as anxiety and depression.

Conflict of Interest Statement

There is no conflict of interest in the writing and publication of this review.

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