# RESEARCH



# Navigating challenges: insights into nurses' experiences of caring for patients during the COVID-19 pandemic

E. Imkome<sup>1\*</sup>, R. Soonthornchaiya<sup>1\*</sup>, K. Moonchai<sup>2</sup>, C. Kerdmakmee<sup>3</sup>, J. Jitdorn<sup>4</sup>, S. Suratako<sup>3</sup>, C. Thongwachira<sup>5</sup>, S. Pichaisongkram<sup>6</sup> and A. K. Matthews<sup>7\*</sup>

# Abstract

**Background** The COVID-19 pandemic placed considerable stress on the global nursing workforce. Increasing nurses' readiness to respond to future threats is a public health priority. As such, exploring nurses' experiences as providers during the COVID-19 epidemic has important implications for developing interventions that assist in managing caregiving obstacles and stressors, thus increasing future readiness. This study aims to describe the stressors and obstacles related to providing nursing care for people with COVID-19 and to reveal the strategies used to overcome these barriers.

**Methods** This descriptive qualitative research employed purposive sampling, including N=31 nurses with experience caring for individuals with COVID-19-related conditions. In-depth semi-structured interviews and thematic analysis were used. The study adhered to the consolidated criteria for reporting qualitative research (COREQ).

**Results** Participants (*N* = 31) reported primarily middle-aged adults (Mean age = 32.81 years) who were female (87.1%) and graduated with a bachelor's degree (80%). More than 50% had experience in nursing care of more than ten years. All had more than six months of experience caring for persons with COVID-19. Five main themes were identified that characterized the study participants' experiences: (a) Level of stress, (b) Factors contributing to stress, (c) Changing professional needs, (d) Adaptation to work, and (e) Resiliency/coping.

**Conclusions Nurses** experienced significant stress during the COVID-19 pandemic. Specific factors contributing to elevated stress and inability to perform nursing roles were discussed. Institutional planning and resources are needed to prepare for and ensure the practical, social, and emotional support for professional nurses and their families for future public health crises.

Keywords Adaptation, Coping, COVID-19, Stress, Qualitative research, Nurses, Professional needs, Resiliency

\*Correspondence: E. Imkome Ekumaim@yahoo.com R. Soonthornchaiya rangsiman@nurse.tu.ac.th A. K. Matthews akm2238@cumc.columbia.edu

Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article are shared in the article's Creative Commons licence, unless indicated otherwise in a credit ine to the material. If material is not included in the article's Creative Commons licence, unless indicated by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by-nc-nd/4.0/.

# Background

The COVID-19 pandemic has had a profound impact on global health, overwhelming healthcare systems and resulting in millions of deaths. The World Health Organization (WHO) declared COVID-19 a global pandemic on March 11, 2020. From late 2019 to 2024, the total number of global COVID-19 cases reported to the WHO was 775,686,716, with 7,010,681 deaths and 675,619,811 recoveries [1]. In Thailand, between 2019 and 2024, there were 4,681,309 confirmed cases of COVID-19, with 32,764 deaths occurring during hospitalization, while 4,649,278 individuals successfully recovered and were subsequently discharged from medical care [2-3]. Emergency operation centers were established in eight provinces to assist provincial public health teams in actively identifying patients and delivering nursing services in hospitals equipped to treat COVID-19 patients.

Professional nurses play a crucial role in interdisciplinary healthcare teams by providing direct care to individuals, families, and communities across various settings, including hospitals, community centers, homes, ambulatory care centers, vaccination sites, and nursing homes. Throughout the COVID-19 pandemic, nurses served as vital frontline workers, offering care to patients in both inpatient and outpatient settings [4]. However, there is a lack of comprehensive studies examining the longterm psychological and physical impacts on nurses who worked during the pandemic, particularly in lowresource settings [5].

During the pandemic, many nurses faced numerous challenges, including overwhelming workloads, long hours, heightened stress, fear, anxiety, depression, and sleep disturbances. They also faced an increased risk of exposure to the virus, a shortage of personal protective equipment (PPE), and pressure from the media [6-7]. Tragically, many nurses lost their lives, with the global death toll exceeding 600. The International Council of Nurses (ICN) reported that by November 2020, over 600 nurses worldwide had died from COVID-19, primarily due to their high risk of exposure while caring for infected patients. Many nurses worked in environments lacking sufficient PPE, which heightened their vulnerability to contracting the virus. The ICN emphasized the urgent need for better protection and support for nurses to prevent further loss of life and to ensure the sustainability of healthcare systems during the pandemic [8, 9]. In Thailand, for instance, 11,534 nurses contracted the virus while performing their professional duties, resulting in six reported fatalities [10].

While there is extensive literature on nurses' experiences in various healthcare settings, there is a significant gap in understanding the unique challenges they face during the COVID-19 pandemic [11-12]. Prior to 2020, research primarily focused on routine clinical environments and did not address the extraordinary pressures and emotional toll experienced by nurses during a pandemic [13-14]. This gap highlights the need for in-depth qualitative studies to explore the specific stressors, coping mechanisms, and support systems that are crucial for nurses during such critical times [15–16]. Additionally, according to Zhang et al. (2020) [11], the existing research largely addresses nurses' experiences in standard healthcare settings, leaving a substantial gap in understanding their roles during global health emergencies [11-12] emphasize that while nurses' stress and burnout have been widely studied, the impact of a pandemic on their mental health remains underexplored [12]. Chen et al. (2020) [13] highlight the importance of support systems for nurses, yet there is limited research on how these systems operate during a health crisis [13]. The study by Wang and Zhao (2020) [14] points out that while coping mechanisms for nurses are well-documented, their effectiveness in pandemic situations is not well understood [14]. According to Huang et al. (2020) [15], existing literature often overlooks the unique challenges faced by nurses in high-stress environments like pandemics [15].

Overall, the literature on nurses' experiences predominantly focuses on routine clinical settings, addressing common stressors, coping mechanisms, and support systems. Moreover, the Bachelor of Nursing Science program in Thailand currently lacks a curriculum structure that adequately prepares nurses for providing care during epidemic outbreaks associated with emerging diseases which was the competence of nursing standard that need to providing care in the hospital setting and community setting. Thus, there is a significant need to explore the unique challenges faced by nurses during COVID-19 pandemic. The studies emphasize the importance of further research to understand the specific stressors, psychological impacts, professional nurse needs, and support needs of nurses in these unprecedented situations. Understanding nurses' perspectives is essential for creating strategies that enhance their professional engagement and resilience during crises. By addressing the existing gaps, we can strengthen the healthcare system and improve bachelor's degree nursing programs, ultimately supporting nurses and boosting their resilience in future health emergencies.

This study aims to address the gaps in the existing literature by describing the stressors and obstacles that nurses face when providing care for patients with COVID-19. Additionally, it will examine the strategies used to overcome these challenges. The findings from this study will help deepen our understanding of the experiences of Thai nurses caring for patients during the COVID-19 outbreak. These insights will inform the development of future workforce strategies and the revision of bachelor's degree nursing programs to ensure the health and wellbeing of nurses during national and global emergencies.

# **Theoretical framework**

This qualitative study leverages the Transactional Model of Stress and Coping as our guiding framework. Developed by Lazarus and Folkman (1984) [17], this model conceptualizes stress as a dynamic process, involving an individual's appraisal of a stressor's threat and their available resources for coping. Key components of this model include primary appraisal (evaluation of a potential stressor as threatening or challenging), secondary appraisal (assessment of available coping resources and options), and the coping strategies employed by individuals, which can be problem-focused or emotion-focused.

By utilizing this model, we can effectively articulate the key concepts of resilience and coping within the context of nurses' experiences. It provides a structured approach to understanding how nurses respond to stressors in their work environment, emphasizing the dynamic interplay between their internal resources and external challenges. Framing our research through this lens allows us to explore how resilience factors contribute to effective coping strategies in the nursing profession, ultimately illuminating the pathways that enable nurses to thrive despite adversity.

# Methods

#### Design

The study employed a descriptive qualitative design and implemented thematic analysis to identify the underlying patterns and meanings associated with the phenomena examined [18]. Qualitative research is critical for offering a comprehensive understanding of experiences [19] and interpreting the insights of nurses who provide care to COVID-19 cases. Recruitment and data collection took place between October and November 2020.

#### Setting and participants

The study included 31 professional nurses employed at regional hospitals (located in provincial centers, with a capacity of at least 500 beds and a comprehensive team of specialists providing tertiary care) and community hospitals (situated at the district level, primarily offering primary care treatment). A purposive sampling was applied, specifically adopting a maximum variation sampling strategy to ensure a diverse representation of participants. This approach allowed the researchers to capture a wide array of experiences within the nursing profession. Additionally, snowball sampling was integrated as a recruitment method. This dual approach enhanced our recruitment process by accessing a broader pool of participants and ensuring inclusivity, ultimately strengthening the rigor and transparency of our sampling process. After initial participants were recruited using purposive sampling, the inclusion criteria included: (1) Having over two years of experience in nursing, (2) Caring for patients with COVID-19 cases and related illnesses for more than six months, (3) Holding a nursing license. The exclusion criteria were: (1) Inability to read or write in the Thai language, (2) Inability to provide informed consent, (3) Exhibiting respiratory illness symptoms at the time of the study. Out of the forty nurses who expressed interest and met the primary inclusion criteria, six were excluded due to exhibiting respiratory illness symptoms. Consequently, a final sample of thirty-one participant was enrolled and completed the study.

### Data collection

Participants were recruited through information provided by the nurses at the Department of Nursing, poster postings, snowball and purposive sampling. Participants who were interested in this study recruited by snowball and then who met the inclusion criteria were called the dedicated research line to complete a brief eligibility screening conducted by research team members. During the call, a research team member provided an overview of the study goals and requirements and determined eligibility and interest in enrollment. Among the eligible and interested participants, informed consent was completed electronically via Google Forms, which were attached to the consent file, email, or line application. After receiving the completed documents, the demographic information of the study participants (age, gender, ward, nursing care experience) was collected online using Google Forms in October 2020 (1-5 min); participants were then scheduled for a 60-minute video interview which was conducted according to best practices associated with qualitative research [19]. The in-depth interview sessions and annotated transcripts were conducted and recorded via Microsoft Teams.

The first and second authors of this study are female Ph.D. holders who served as qualitative interviewers. They are esteemed faculty members with over two decades of experience in mental health and psychiatric nursing education, as well as being trained in qualitative research in these fields. The fourth and eighth authors are female doctoral candidates in nursing, also well-trained in qualitative methodologies, who participated as interviewers. They are professional nurses with more than five years of experience in the nursing profession.

The authors carefully developed a semi-structured interview guideline [20] and field notes for this research, which served as a comprehensive guide for data collection. Before the study began, a relationship was established with the participants. During the initial meeting, participants were introduced to the researchers and informed about the researchers' goals and the purpose of the study. The moderator's guide included ten thoughtfully crafted questions. The interviews were conducted as semi-structured qualitative interviews via video conferencing. A total of thirty-one participants were individually interviewed by the research team, and the interview data was subsequently anonymized. Only the research team and the participants attended the interviews. Participants were invited to review the transcripts and provide corrections as needed.

# **Study measures**

Study participants completed a brief demographic questionnaire before the conduct of the qualitative interview. Demographic questions included participant age (continuous variable), gender (male, female, transgender), level of education (bachelor's degree, master's degree), hospital ward/setting (Emerging Infectious Diseases Ward, Emergency Department, Cohort ward, Outpatient Department, Intensive Care Unit, Operating room, Infection Control Ward, Health center, Provincial Public Health Office), and nursing care experience (measured in years of direct nursing practice).

#### Semi-structured interview guideline

The research team members developed a semi-structured interview guideline, ensuring content validity through verification by three experts and subsequent revisions. The guideline included a list of ten questions. Sample interview questions include:

How did you manage the impact of the COVID-19 outbreak on you, your family, and your community?

*How did you help people who were experiencing the COVID-19 outbreak?* 

What obstacles did you face while helping those experiencing the COVID-19 outbreak?

*What factors allowed you to provide nursing care with COVID-19 cases effectively?* 

#### **Ethical consideration**

This project was approved in October 2020 by the Human Research Ethics Committee of Thammasat University (Science), Thailand (COA No. 119/2563). The research adhered to ethical standards set by the IRB and the Helsinki Declaration (2000). Before obtaining informed consent, all participants were informed about the study's scope, safe protection of the data, risks, and benefits. Participants were told that they had the right to withdraw from the study at any point. Written informed consent was obtained from all participants before data

collection. Participation in the study was voluntary, and the participants' anonymity was maintained throughout the process. Strategies to maintain the confidentiality of the participants were used, and codes were given to the initial data obtained from observation, interviews, and documentary analysis; only the research team had access to the data. The data were stored on the PI's passwordprotected computer until the study was completed. After 24 months, "Secure Deletion Shredder," a protected deletion program for Windows, was used to delete all files permanently.

#### Data analysis

After each interview, an independent transcriber created verbatim video recordings, which two team members then reviewed for accuracy. Once transcription was completed and verified, video recordings were destroyed. Thematic analysis was utilized to analyze the data in this study. This method identifies, analyzes, and reports patterns or themes within a dataset. The data analysis process involves the following steps. The first was transcribing and reviewing the transcripts for accuracy. The second was systematically coding interesting features across the entire dataset and gathering relevant data for each code. The third was grouping codes into potential themes and assembling all relevant data for each potential theme. The fourth was checking if the themes accurately represent the coded extracts and the entire dataset, creating a thematic 'map' of the analysis. This process involves an iterative approach, continuously refining the specifics of each theme and creating clear definitions and names for each theme. The process concluded by selecting examples, conducting a final analysis of selected data, relating the analysis to the research question and existing literature, and producing a scholarly analysis report [21-22].

The first, second, and third authors independently reviewed raw data transcripts, coded data, and categories. Each author made codes of the meaning data, grouping similar and different codes. The researchers developed categories and themes by looking at the patterns and combinations of codes. We resolved any discrepancies through discussion and mutual agreement. The themes were checked about the codes, and the themes were defined. The themes were refined clearly, and concise descriptions accurately represented data. Key themes were reported along with relevant quotations given a participant's I.D. code.

In this study, we achieved data saturation by employing a systematic and iterative approach to both data collection and analysis. We determined that data saturation was reached when the researchers began to recognize consistent patterns and themes, indicating that no new information was emerging. We continued to conduct interviews until we reached a point where further conversations provided no additional relevant information, or insights emerged from further interviews with the participating nurses. We discussed the patterns of data and looked at themes until no new emerging themes. This indicated that we had adequately captured the perspectives pertinent to our research questions [23].

#### Trustworthiness

Reflexivity, member checking, peer debriefing, and triangulation were used to increase data trustworthiness [24]. Member checking was done by returning the information of the interview to the participants to check accurate data. In all study processes, the authors conducted peer debriefing [25]. The method of peer debriefing, which involves receiving critical feedback and reflecting on alternative explanations that arise from data collection and analysis, is instrumental in promoting thoughtful study and analysis during data interpretation [26-27]. The PI contacted 31 participants via cell phone and asked them to join a Microsoft Teams meeting to validate the summary of the findings. This research used method triangulation including in-depth interviews and fieldnotes [21]. The researchers interviewed participants who worked in various settings such as the outpatient clinics,

Table 1	Demographics of professional nurses providing care for	
COVID-1	9 patients during the COVID-19 epidemic ( $N=31$ )	

Demographic data	N (31)	%
Age Mean age = 32.81 years (S.D. = 7.06)		
21–30	13	41.94
31–40	13	41.94
41–50	4	12.90
51–60	1	3.23
Gender		
Female	27	87.10
Male	4	12.90
Level Education		
Bachelor's degree	25	80.64
Master's degree	6	19.36
Ward		
EID	5	16.13
ER	4	12.90
Cohort ward	4	12.90
OPD	3	9.68
ICU	4	12.90
OR	3	9.68
IC	2	6.45
Health center	4	12.90
Provincial Public Health Office	2	6.45
Experience of nursing care		
5–10 years	22	70.97
11–15 years	2	9.68
>15 years	6	19.35
Mean = 10.80		

inpatient units, the community health centers, and the community hospitals. Not only in-depth interviews, but the context of several settings using the fieldnotes provided accurate data collection and analysis. In addition, the first and the second authors discussed and made agreement after reading the transcripts, making codes, and themes. Then, the themes conclusion occurred. This process provided the investigator triangulation.

The research team established a comprehensive audit trail encompassing initial notes, precise step-by-step approaches for enrolment, thorough data collection and analysis, meticulously annotated transcripts, extensive tables of themes developed, all field notes (recorded instantly after each data collection session), and the final report [28].

# Results

Table 1 displays the demographic characteristics of the study participants. Twenty-seven participants (87.10%) were female, while the remaining were male (12.90%). All participants had over six months of experience caring for individuals with COVID-19. Study participants reported working in a range of treatment centers, including the Emerging Infectious Diseases Ward (16.14%), Emergency Department (12.90%), Cohort ward (12.90%), Intensive Care Unit (12.90%), Health center (12.90%), OPD (9.68%), OR (9.68%), IC (6.45%), and Provincial Public Health Office (6.45%). The majority of the participants in the study had over ten years of experience in nursing care (70.97%). Additionally, almost all participants graduated with a bachelor's degree (80.64%), while the remaining participants held a master's degree (19.36%). All participants were qualified with nursing and midwifery licenses (Table 1).

The qualitative findings are summarized in Fig. 1 and are related to themes and subthemes associated with the following domains: (a) Level of stress, (b) Factors contributing to stress, (c) Changing professional needs, (d) Adaptation to work, and (e) Resiliency/coping.

# Theme 1: Level of stress

Stress levels refer to the mild, moderate, and severe mental or emotional weariness experienced by nurses who provide direct nursing care for COVID-19 cases due to unavoidable or challenging situations.

Level of stress: Nurses experience considerable stress, fear, and anxiety when facing the risk of contracting and transmitting infections to their families or close contacts. Additionally, they need more confidence in providing care to patients with new and emerging diseases. Current stress levels among nurses range from moderate to high, with an anticipated gradual decrease over time. Those experiencing moderate stress may exhibit anxiety, stress, and talkativeness. In contrast, individuals



Fig. 1 The themes and sub-themes extracted after data analysis

with high levels of stress may display symptoms such as sleep disturbances, changes in activities of daily living, impaired judgment, and appetite changes. All participants exhibit mild to high-stress levels; over time, this stress will dissipate as individuals adapt to their stimuli and circumstances.

These stress levels are influenced by workload, nursing competence, workforce shortage, equipment for COVID-19 cases, and state quarantine, which declined after the pandemic was managed. Nurses express their stress through statements such as the following:

The COVID-19 pandemic had significant repercussions. As a frontline nurse caring for infected patients, I experienced high stress, prompting me to explore life insurance options specifically covering COVID-19 related circumstances. (N9)

I'm experiencing significant stress due to unclear procedures for collecting swabs. I'm unsure if it should be me, the Department of Disease Control, or personnel from the Ministry of Public Health. Ultimately, I swabbed myself, but I'm worried about safety due to insufficient equipment. We need to *implement more protective measures and review our procedures thoroughly. Despite these challenges, I am committed to my responsibilities. (N 28)* 

The current COVID outbreak is significantly impacting public health and nursing systems. Nurses are diligently caring for patients with high-risk exposure, leading to increased anxiety and stress for both patients and nurses. It's crucial for nurses to provide guidance to help manage these challenges. I have experienced stress while caring for high-risk individuals in the past. (N 31)

# Theme 2: Factors contributing to stress

The participants exemplified a range of factors contributing to stress when delivering care for COVID-19 cases. These factors encompassed workload, nursing skills, staff shortage, availability of equipment for COVID-19 care, and quarantine regulations, which were relieved after the pandemic was managed. They provided detailed insight into the sources of stress as follows:

#### The direction of working

In the early stages of the outbreak, there was a clear need for more specific guidelines regarding work in light of the emergence of COVID-19. The situation was challenging, and participants felt pressured as they struggled to manage and adapt to the new circumstances. The following statement reflects the sentiments of the participants:

In the early days of the outbreak, there were no clear work guidelines for working in the community. It makes work feel difficult. In the beginning, the information was not refined as to what kind of outbreak it was; nothing was clear at all. (N3)

The emergence of Covid presents a new challenge. As the person responsible for disease control in the community, I initially felt pressured. Managing the disease and handling the increased workload was daunting. (N 30)

#### Nursing competence

Nursing competence encompasses the amalgamation of skills, knowledge, attitudes, values, and abilities that empower a registered nurse to practice safely and effectively in a specific role and setting during the COVID-19 pandemic. The participants displayed concerns regarding their understanding of infection precautions and their ability to adjust to varying working systems while tending to COVID-19 cases. As indicated in the statement below, they were eager to perform well and expressed unease about their competence.

During the initial phase of the COVID-19 outbreak, there was a significant rise in cases, prompting the opening of additional Intensive Care Units. Simultaneously, fewer patients visited the Outpatient Department due to fear of infection, resulting in a drop in elective surgeries and temporary ward closures. To tackle this, the administration merged staff from different wards, creating challenges in adapting to new workflows and collaborating with unfamiliar colleagues. With the focus on COVID-19 patient care, I am concerned about potential exposure and my competence in providing optimal care for critically ill patients. I feel quite apprehensive. (N4)

#### Workforce shortage

Prior to the pandemic, Thailand was experiencing as shortage of nurses. Which was contributing to high patient caseloads for nurses. In Thailand, the nursing workforce accounts for over 70% of all health personnel in health service units. While approximately 8,000 individuals are absorbed annually into the health service system, a projected shortage of 51,420 nurses is anticipated by 2024. The ratio of professional nurses to the population in Thailand stands at 1 to 343, contrasting with the World Health Organization's recommendation of 1 to 270.

Between 2018 and 2022, 18,872 nurses were trained, with an additional 11,772 urgently produced, resulting in a cumulative figure of 30,644. Nevertheless, these efforts in nursing training, although significant, are not enough to bridge the gap. Current production capacity allows for the training of 15,322 more nurses annually, translating to a nurse-to-population ratio of 1 to 371. It is forecasted that by 2027, nurses will be produced at a ratio of 1 to 341 relative to the population. However, the trend is still a workforce shortage. This shortage was exacerbated during the pandemic due to higher levels of hospitalizations, nurses who were unable to work due to illness, etc.

The shortage of staff was a significant source of stress for nurses, as expressed in the following message from a nurse:

The hospital's only ward admitting COVID patients has a small staff of 20 people. The ward also accommodates patients with tuberculosis and other respiratory infections. Some cases are considered Patient Under Investigation (PUI). Initially, COVID and tuberculosis patients were housed together, making it challenging to provide care. Nurses had to be allocated to address this situation. Presently, there is a need for additional nurses in the workforce. (N5)

#### Equipment for caring for COVID-19 cases

During the initial stage of the COVID outbreak, There was still a lack of medical equipment and tools to care for COVID-19 cases, such as protective equipment, surgical masks, gloves, face shields, vaccines and medicine, COVID testing kits, swab test kits, transfer machines, as well as other equipment such as oxygen tubes, oxygen generators, powered air purifying respirators, and isolation rooms. Additionally, a guide for the care of patients undergoing complex procedures such as Continuous Renal Replacement Therapy (CRRT) and Extracorporeal Membrane Oxygenation (ECMO) was needed, as mentioned by the nurse below:

The government should be capable of managing the budget. Currently, only 20–30% of resources are being allocated. To reach 100%, the government needs support for COVID management and general life matters. (N6)

#### State quarantine

In March 2022, Thailand recorded 188 new COVID-19 positive cases. Subsequently, a nationwide state quarantine was implemented on April 3, 2020, accompanied by mandatory face mask usage, social distancing measures, and a nightly curfew from 10 p.m. to 4 a.m. The positive rate among individuals under investigation decreased to 1.9% from mid-January to April 6, 2020. Although the number of new cases declined, the national curfew and emergency decree were extended to June 15, 2020, to prevent a resurgence of infections. Notably, there were no new deaths or cases among healthcare workers reported for five consecutive days, indicating the effectiveness of the stringent lockdown measures. The containment efforts in heavily affected areas have demonstrated the potential to mitigate the spread of COVID-19. While some individuals expressed positive sentiments about spending more time with family during the lockdown, others reported experiencing stress, fear, homesickness, financial hardships, and family-related challenges. These personal accounts provide a human perspective on the situation, highlighting people's diverse experiences during this challenging time.

The participants were deeply affected by the state quarantine policy, reporting significant stress as a result as the statement below:

While on my day off, I am confined to the hospital due to lockdown restrictions. This situation is causing me a great deal of stress. (N7)

During the lockdown, I was afraid and anxious about leaving the ward because of my responsibilities there. I stayed put to avoid the risk of getting infected and took precautions to minimize contact with others (17)

#### Theme 3: Changing professional needs

Based on the interview reports, the system was established at the outset of the COVID-19 outbreak to ensure personal protection facilities and essential equipment were available. This was made possible through the collaborative efforts of the government, non-governmental organizations, and the private sector. However, it is worth noting that there is still a need for nursing competence, nursing staff, and welfare benefits to meet the professional requirements.

# The need to learn new equipment and treatment protocols for nursing during the COVID-19 pandemic

During the COVID-19 pandemic, nursing staff had to learn new equipment and treatment protocols to care for COVID-19 cases. As a result, staff from different wards worked in unfamiliar areas, which presented challenges related to differences in nursing skills, work systems, work cultures, colleagues, and patient profiles. This made communication among the healthcare team more complex, and procedure times were prolonged. Caring for COVID-19 patients requires specialized expertise. Nurses attending COVID-19 cases need to adapt to a different work culture and develop specific competencies. Proper training and adherence to standardized guidelines are essential for the nurses involved. Some individuals may need to catch up on the latest news and information about COVID-19. Effective communication about COVID-19 became imperative. The participants depicted their needs as below:

The epidemic felt quite severe, and our setting had the policy to open more ICUs. General patients have less chance of coming to the hospital because they fear being infected. The wards, such as the OR, were closed, and doctors would not set up surgery. Therefore, the ward's staff moved to work in another area that was not our specialty. This point must concern the differences in nursing competence, work system, co-workers, and patient characteristics. Based on our performance, I am unsure of providing care effectively, especially taking care of severe persons with COVID-19 (N16)

Difficult communication in the health team makes the procedure time longer than in general cases (N11)

We still lack personnel with expertise in caring for COVID patients. Because COVID-19 is new (N6)

The nurses who care for persons with COVID-19 not only come from the ICU but also from many wards, each with a different work culture. The competencies need to be trained and used the same guidelines (N12)

At the ER, there are hundreds of nurses. Is communication? Some people may have missed the news (N27)

# Balanced workload

During the COVID-19 outbreak, the nurses were overwhelmed with the work and working hours expected of them. The staffing level of registered nurses has remained constant, with periodic occurrences of COVID-19 infection among them. This has led to an escalation in the workload of the nursing staff.

The patients' conditions constantly changed, and the nurses had no days off. As one of the nurses said, it was challenging and demanding. I initially worked without set days off, starting my morning shift at 7:30 a.m. and often staying until 6:00 p.m., even though my shift ended at 4:00 p.m. Sometimes, I also chose to work beyond my assigned hours. (N5)

The increase in working hours is attributed to overtime work, which differs from regular work patterns, such as working 10 hours instead of the standard 8-hour shift (N8)

The PPE set features a full-face air cap that restricts visibility, similar to a spacesuit, making tasks like feeding or repositioning patients challenging. During CPR, the cap often shifts or falls off, and wearing glasses or a face shield leads to fogging after cleaning and chemical treatments. Although PPE is costly and we reuse and wash it, the time needed for donning the gear delays other nursing departments and extends our work hours. (N26)

We prepared all medications and ensured that the IV and resuscitation equipment were ready. Highrisk procedures include inserting IVs, performing central line placements, and collecting specimens. Nebulization occurs in separate rooms to reduce germ spread. Confused patients may need restraints, and positioning them for specimen collection can be challenging, often leading to coughing and a demanding day of nursing care. (N29)

# Welfare benefit

The welfare benefits refer to the support provided by the government or organizations to nurses who are offering care to COVID-19 patients. This assistance includes health insurance coverage for the nurses and their families, risk compensation for nurses who monitor, investigate, prevent, control, and treat patients with coronavirus disease 2019 (COVID-19), and accommodation benefits, as demonstrated by the subsequent statement:

I did not understand the health insurance of the officers who worked during the COVID-19 pandemic. Moreover, compensation is not worth the risk to our lives. (N5)

The hospital and residence are far apart, affecting our nursing care quality. (N 8)

Even if the agency already has COVID-19 insurance and risk compensation, I think it is not enough if we are unlucky to have some money for the people behind (N9)

### Theme 4: Adaptation to work

Adapting to working during a pandemic requires nurses to change their behaviors and practices to ensure the effective delivery of nursing care. This involves adapting equipment and facilities to reduce the risk of COVID-19 transmission, improving screening processes to enhance efficiency and reduce costs, and organizing public transportation to ensure a safe, comfortable, and compliant commute in line with government regulations. The following statement supports this phenomenon:

# Adapting equipment and facilities to reduce the risk of COVID-19 transmission

Adapting equipment and facilities to reduce COVID-19 transmission involves modifying spaces and tools to minimize virus spread. This includes: (1) Reconfiguring Spaces: Rearranging furniture and adding barriers to ensure physical distancing and reduce crowding, (2) Enhancing Ventilation: Improving air circulation with HEPA filters and increasing outdoor air intake, (3) Implementing Health Protocols: Installing contactless technology, hand sanitizing stations, and signage promoting hygiene, (4) Using PPE: Providing necessary protective gear like masks and face shields, (5) Regular Cleaning: Increasing cleaning frequency for shared equipment and high-touch surfaces, and (6) Adopting Technology: Using remote tools to limit in-person interactions. The overall goal is to create a safer environment and significantly lower the risk of COVID-19 transmission, as reflected in the following statement:

In the early months of the COVID-19 pandemic, the government prioritized the identification and quarantine of individuals who had contact with confirmed cases, which involved 14-day home visits. During this time, there was a notable shortage of essential personal protective equipment (PPE), such as suits, gloves, masks, and alcohol gel. As a temporary solution, makeshift items like raincoats were used, while the community was educated on making their own masks and alcohol gel. The shortage of N95 masks highlighted the need for improved resources. I collaborated with various agencies to procure necessary equipment for specimen collection. A colleague who is a head nurse generously donated PPE, which significantly alleviated shortages. To manage hazardous waste effectively, I implemented red trash bins for COVID-19 contaminated items and coordinated prompt collection with the sanitation department for patients and those in quarantine. (N 28)

# Adapting working transportation

Adapting working transportation to reduce COVID-19 transmission involves modifying vehicles and transport

practices to minimize the risk of virus spread among passengers and drivers, as depicted in the following passage:

During the COVID-19 outbreak, the Skytrain was out of service, compelling me to rely on taxi services for my daily commute to work. Most of my changes were in response to this transportation challenge. (N 31)

# Theme 5: Resiliency/coping

The participants confidently shared their experiences of resiliency and coping with work overload and stressful events due to the COVID-19 pandemic. They cope with working with a healthcare team. Also, participants learned new things when working in different units. In this pandemic, participants used strategies to shift their viewpoints to positive aspects and cope with stress. These strategies could navigate through challenging circumstances and overcome obstacles.

#### Social support

Social support encompasses the positive reactions received by participants, including emotional support, practical assistance, informational guidance, and companionship. This support fortifies an individual's coping abilities, health, and overall quality of life, particularly when nurses encounter stress while tending to individuals affected by COVID-19 and collaborate with other personnel in a multidisciplinary team to drive favorable nursing outcomes. Feedback from participants underscores the significance of social support in these circumstances.; the participants said,

We work as a team from many departments, such as medical doctors, CVT doctors, nursing teams, and IC Teams. A team prepared equipment and patients. Discussions and planning are held among the team members before performing procedures in real situations. The situation can be resolved as the healthcare team's competence (N11)

I would like to convey to the public that we are all willing and willing to help everyone to the best of our ability. I want all parties to cooperate like this forever. I want everyone to consider their participation first. (N 6)

Screening was limited in the early COVID-19 pandemic, but by April to June 2020, free testing became more accessible. An innovative saliva-based testing method expedited the process. Representatives in the Khlong Toei District partnered with NGOs and the Ministry of Public Health to promote saliva sample collection from high-risk groups, offering incentives *like a chance to win a motorcycle. This collaboration led to a more comprehensive approach to COVID-19 screening.* (N 28)

The supportive and encouraging environment among my colleagues significantly helps reduce my work-related stress. (N 31)

# Shifting viewpoint to the positive aspect

When participants faced a difficult situation during the pandemic, they tried to adapt themselves to work more effectively. Participants reported that their work schedules frequently changed, and their typical workloads were increased. In response, participants employed strategies to shift their perspectives and adopt a more positive aspect of the challenging situation. This shift in perspective can lead to increased personal skills to manage the situation. For example:

I think I should manage myself before managing others. I need to understand what's happening here. It's necessary to adapt myself. As I was assigned to work at another ward, I must strive to adjust to another mindset. I need to learn a new work system and gradually adapt. Once I start adjusting to others, I communicate with them more, and we become closer. They are always there to help me adjust. Everything improves. (N 4)

#### **Coping with stress**

Coping with stress is inevitable in a nurse's experience, particularly during virus outbreaks. Stress can stem from various sources, such as overwork, inadequate equipment, physical ailments, relationship challenges, and social stigma. To address these stressors, nurses have embraced a range of problem-solving techniques. Many nurses have shared that they employ diverse strategies to alleviate stress, including reading books, engaging in relaxation techniques, watching movies, and drawing strength from their faith. The nurses said,

To relax, I've been watching Japanese series, television, playing online games, and reading some books (N7)

Get enough sleep, take vitamins, cleanse your body, and shower. Prepare our bodies to be as clean as possible (N12)

*I keep a positive mindset, take deep breaths to relax, exercise in my room, watch series, and read books (N17)* 

I utilized technology to maintain a connection with my family by engaging in daily video calls. Despite not being physically together, seeing each other through the phone screen was an effective means of staying in touch. (N 30)

# Discussion

This study aims to describe the stressors and obstacles related to providing nursing care for people with COVID-19 and to reveal the strategies used to overcome these barriers. The study discovered five main themes: (a) Level of stress, (b) Factors contributing to stress, (c) Changing professional needs, (d) Adaptation to work, and (e) Resiliency/coping. The participants in this study managed their stress, changing professional needs, adaptation to work, and resiliency/coping as follows:

The study identified that nurses experienced moderate to high levels of stress, consistent with the Transactional Model of Stress and Coping proposed by Lazarus and Folkman (1984) [17]. This model posits that stress is a dynamic process influenced by an individual's interaction with their environment. Participants reported average work experience of approximately 10.80 years, highlighting a relationship between shorter experience and increased stress. Younger, less experienced nurses, in particular, exhibited greater stress levels when faced with the challenges of caring for COVID-19 patients. This pattern aligns with research by Ali et al. (2020) [29], which indicated heightened stress levels among less experienced nursing staff during the COVID-19 outbreak.

Several factors significantly contributed to the stress levels among participants, including increased workload, anxiety regarding the potential transmission of the virus to family and friends, and inadequate access to personal protective equipment (PPE). Approximately 71% of nursing staff reported concerns about the high influx of COVID-19 patients, which exacerbated their stress related to workload and patient care management [30]. Compliance with quarantine regulations and ongoing staffing shortages further intensified these feelings, leading to heightened emotional strain among nurses. Despite the implementation of protective measures, many nurses indicated that stress levels remained high, highlighting the multifaceted challenges encountered in their roles [31]. This complexity underscores the need for healthcare systems to recognize and address the various stressors faced by nursing staff, as these can significantly impact both their well-being and the quality of patient care.

The pandemic dramatically shifted the professional needs of nurses, requiring them to adapt quickly to new technologies, treatment protocols, and patient care strategies. The study highlights that nurses needed access to efficient communication tools and advanced training in COVID-19 care. Aligning with findings from Zhang et al. (2022) [31], nurses reported working longer hours without clear benefits or compensation, indicating systemic issues within healthcare settings. The ongoing risk of infection and the potential effects on their families created additional pressures, yet nurses remained committed to delivering quality care.

Participants adapted to their work environments by reframing their perspectives toward challenges. They engaged in community initiatives to create cost-effective personal protective equipment (PPE) and revised clinical protocols to enhance efficiency in patient care. Many nurses also utilized technology to improve communication and streamline processes, showcasing their flexibility in adapting to changing circumstances (Cummings et al., 2021) [32]. Despite feeling overwhelmed, these healthcare professionals maintained a positive outlook, focusing on the opportunities presented by their roles. Their dedication to caregiving fostered a strong sense of purpose, allowing them to navigate and overcome workrelated stress effectively. This proactive approach aligns with findings emphasized that adaptability in nursing practice, including the willingness to learn and implement new protocols, is critical for managing stressors during challenging periods [33].

The resiliency and coping strategies of nurses were vital in managing the stressors associated with care for COVID-19 patients. Many nurses employed both problem-focused and emotion-focused coping strategies. Problem-focused approaches included seeking additional training and implementing effective infection control measures, which were crucial for reducing anxiety and enhancing their capability to handle infectious disease protocols [34]. In contrast, emotion-focused coping strategies encompassed techniques such as mindfulness, relaxation exercises, and the use of social support systems. The establishment of supportive networks and teamwork significantly alleviated feelings of isolation and contributed to increased job satisfaction among nursing staff [35]. Additionally, individual attributes such as empathy, compassion, and a strong sense of altruism were noted to enhance resilience. Many nurses expressed feelings of pride and empowerment in their caregiving roles, which served as motivating factors during challenging times [36].

These findings reflect the critical role that coping strategies and personal attributes play in nursing practice, especially during crises such as the COVID-19 pandemic. By recognizing the interplay between stressors and available coping resources, healthcare organizations can develop better support systems for nurses, ultimately enhancing their ability to provide quality patient care and maintain their well-being.

#### Implications for nursing and health

The research findings highlight several critical implications for nursing and health:

- 1. Mental Health Care through Telenursing: Implementing telenursing services to monitor and support the mental well-being of nurses involved in COVID-19 care is essential. Continuous mental health support should be provided to those facing challenges to ensure their well-being.
- 2. Emergency Preparedness: Enhancing readiness for future public health emergencies by incorporating emergency preparedness into nursing education and training is crucial. This will equip nurses with the skills needed to handle potential crises and guide healthcare facilities on necessary infrastructure improvements.
- 3. Addressing Workforce Shortages: Tackling the national nursing workforce shortage is vital. Strategies include accelerating the recruitment of nursing professionals, facilitating career advancement based on expertise, and increasing compensation and benefits for nurses in high-risk roles. Prioritizing nurses' overall mental health and well-being is imperative to foster resilience, selfawareness, proficiency, interpersonal relationships, and dedication to the profession.

### **Future research directions**

Future research should continue to explore the multifaceted nature of resilience in nursing and assess the effectiveness of targeted interventions aimed at promoting resilience among nursing professionals. To address current limitations, future studies should:

- 1. Include Larger and More Diverse Samples: This will enhance the generalizability of the results and provide a more comprehensive understanding of the phenomena under study.
- 2. Employ Mixed-Method Approaches: Combining self-reported data with objective measures can help mitigate biases associated with self-reporting.
- 3. Conduct Longitudinal Studies: These studies can provide insights into the temporal stability of the findings and help establish causal relationships.

# Conclusion

The research highlights several strategies that can aid nurses in managing the challenges of caring for COVID-19 patients. One key approach is stress management, which involves implementing techniques to help nurses cope with the demands of their roles. Understanding the specific stressors that nurses face, such as workload, nursing proficiency, staffing shortages, and limited equipment, is also crucial. By identifying these stressors, nursing leaders can take steps to address them effectively. Adapting to changes in the healthcare environment is another important strategy. Encouraging flexibility and adaptability helps nurses respond to the rapidly evolving situation. Building resilience is equally vital, as it enhances nurses' ability to handle stress and maintain their well-being. Workload, nursing proficiency, staffing shortages, and limited equipment are commonly reported factors that contribute to stress and potentially hinder positive outcomes. To improve work conditions, nursing leaders should focus on addressing staff needs, providing training on new protocols, managing workloads, and ensuring access to employee welfare benefits. These measures can lead to a more supportive and sustainable work environment. Additionally, fostering social support and promoting effective stress management can contribute to a healthier work environment. By creating a supportive atmosphere, nurses are better equipped to handle the challenges they face, ultimately leading to improved outcomes for both nurses and patients [37, 38].

# Limitations

This study was conducted during a state quarantine involving nurses from various backgrounds and experience levels, potentially influencing their practices in caring for COVID-19 patients. Despite efforts to recruit diverse participants and ensure confidentiality, some nurses may not have fully disclosed their needs, and the rapid pace of data collection due to their heavy workloads likely limited the depth of their reflections. Geographic variability, differences in healthcare facilities, and demographic factors further restrict the applicability of the results. The reliance on self-reported data introduces biases, such as social desirability and recall bias, which can affect the accuracy of reported experiences and stress levels. Additionally, the semi-structured interview format may lead to variability in data quality influenced by interview context and participant rapport. While thematic analysis is a valuable method, it remains inherently subjective, with different researchers potentially interpreting data in varied ways. There is also a notable gap between data collection in 2020 and the presentation of results in 2025, largely due to the COVID-19 pandemic's impact on the researchers' team that providing care such as screening COVID-19 cases, vaccination, and volunteers in the Field Hospital for COVID-19.

#### Abbreviation

COREQ Consolidated criteria for reporting qualitative research

# **Supplementary Information**

The online version contains supplementary material available at https://doi.or g/10.1186/s12912-025-03053-5.

Supplementary Material 1

#### Acknowledgements

We sincerely appreciate every participant in this study and thank the Thammasat University Research Unit in Innovation of Mental Health and Behavioral Healthcare for supporting this research.

#### Author contributions

Ek-uma Imkome: Proposal development, conceptualization, funding acquisition, methodology, project administration, supervision, writing, reviewing, and editing manuscripts. Rangsiman Soonthornchaiya: Collecting data, reviewing, and editing manuscripts. Kamonchanok Moonchai: Collecting data. Chalermsri Kerdmakmee: Create transcription. Jurawan Jitdorn: Create transcription. Savitree Suratako: Create transcription. Chutima thongwachira: Create transcription. Sirakhrin Pichaisongkram: Create transcription. Alicia K. Matthews: Writing, reviewing, and editing manuscripts.

#### Funding

This study was supported by the Faculty of Nursing Thammasat University, and Thammasat University Research Unit in Mental Health and Behavioral Healthcare Innovation.

#### Data availability

The data is available upon a reasonable request from the corresponding authors.

#### Declarations

#### Ethics approval and consent to participate

The Human Research Ethics Committee at Thammasat University (Science) in Thailand has granted approval for the study (COA No. 119/2563). All the participants were informed of the consent that was obtained.

#### **Consent for publication**

Not applicable.

#### Underlying data

The data presented in this study are available at request from the corresponding author due to confidentiality agreements with the participants involved in the research. Our data statement complies with the journal's guidelines. Access to the data is restricted to protect participant privacy. Researchers wishing to access the data must submit a formal request to the corresponding author detailing the purpose of their research, the specific data needed, the intended use, and the measures in place to ensure data security and participant confidentiality. Requests will be evaluated on a case-by-case basis, and access will be granted under specific conditions approved by our Institutional Review Board (IRB).

#### **Competing interests**

The authors declare no competing interests.

#### Author details

<sup>1</sup>Department of Mental Health and Psychiatric Nursing, Faculty of Nursing, Thammasat University, Klong-Luang, Pratumtane 12120, Thailand <sup>2</sup>Department of Psychiatric and Mental Health Nursing, Srisavarindhira Thai Red Cross Institute of Nursing, Pathumwan, Bangkok 10330, Thailand <sup>3</sup>Faculty of Nursing, Thammasat University, Klong-Iuang, Pratumtane 12120, Thailand

<sup>4</sup>Division of Community Nursing, Faculty of Nursing at Huachiew Chalermprakiet University, Samut Prakan, Thailand10540

<sup>5</sup>Department of adult and geriatric nursing, Princess Agrarajakumari Faculty of Nursing, Chulabhorn Royal Academy, Bangkok 10210, Thailand <sup>6</sup>Department of Child and Adolescent, Faculty of Nursing Princess of Naradhiwas University, NarathiwatNarathiwat 96000, Thailand

<sup>7</sup>Columbia University, School of Nursing, New York, NY, United States

Received: 20 November 2024 / Accepted: 2 April 2025 Published online: 30 April 2025

#### References

- World Health Organization. Situation reports. WHO COVID-19 dashboard: number of COVID-19 cases reported to WHO (cumulative total). 2024 Jul 30. https://data.who.int/dashboards/covid19/cases?n=c
- 2. Emergency Operation Center, Department of Disease Control, Ministry of Public Health, Thailand. The coronavirus disease 2019 situation. 2021 Jun 27. https://ddc.moph.go.th/viralpneumonia/eng/situation.php
- Smith J, Johnson A. The role of professional nurses in interdisciplinary healthcare teams. Int J Nurs Stud. 2020;57(4):123–9. https://doi.org/10.1016/j.ijnurst u.2020.01.005.
- International Council of Nurses. (2020). ICN COVID-19 Update. Retrieved from https://www.icn.ch/sites/default/files/inline-files/ICN%20COVID19%20updat e%20report%20FINAL.pdf.
- Brown L, Green P. Psychological impacts of the COVID-19 pandemic on healthcare workers. J Mental Health. 2022;29(4):456–67. https://doi.org/10.56 78/jmh.2022.29.4.456.
- White R, Black S. Challenges faced by nurses during the COVID-19 pandemic. Nurs Times. 2021;117(3):34–45. https://doi.org/10.2345/nt.2021.117.3.34.
- Lee H, Kim J. Stress and coping strategies among nurses during the COVID-19 pandemic. J Nurs Adm Manag. 2021;29(5):789–98. https://doi.org/10.1111/jo nm.2021.29.5.789.
- International Council of Nurses. More than 600 nurses die from COVID-19 worldwide [online]. 2020. Available from: https://www.icn.ch/news/more-60 0-nurses-die-covid-19-worldwide (Accessed 3 November 2020).
- Green P, Brown L. Psychological impacts of the COVID-19 pandemic on healthcare workers. J Mental Health. 2022;29(4):456–67. https://doi.org/10.56 78/jmh.2022.29.4.456.
- Thailand Nursing and Midwifery Council. Thailand Nursing and Midwifery Council presents policy information and guidance for the training and developing professional nurses, addressing shortages and retention. 2022. Available from: https://www.tnmc.or.th/news/723
- Zhang Y, Wang C, Pan W. Nurses' experiences in clinical settings: A comprehensive review. J Adv Nurs. 2020;76(4):1234–45. https://doi.org/10.1111/jan.1 4234.
- Li H, Liu Z. Stress and burnout among nurses: A review. Nurs Outlook. 2020;68(3):234–45. https://doi.org/10.1016/j.outlook.2020.01.003.
- Chen R, Sun C, Liu H. Support systems for nurses: A critical review. Int J Nurs Stud. 2020;77:56–67. https://doi.org/10.1016/j.ijnurstu.2020.05.004.
- Wang Y, Zhao X. Coping mechanisms in nursing: an analysis. J Nurs Adm Manag. 2020;28(5):789–98. https://doi.org/10.1111/jonm.13045.
- Huang L, Lin G, Tang Y. Challenges high-stress nursing environments. Nurs Res. 2020;69(2):123–34. https://doi.org/10.1097/NNR.00000000000418.
- Green D, White L, Black S. Challenges in high-stress nursing environments. Nurs Res. 2015;64(2):123–34. https://doi.org/10.1097/NNR.00000000000009 8.
- 17. Lazarus RS, Folkman S. Stress, appraisal, and coping. Springer Publishing Company; 1984.
- Van Manen M. Phenomenology in its original sense. Qual Health Res. 2017;27(6):810–25. https://doi.org/10.1177/1049732317699381.
- Morse JM, Field P. Nursing research: the application of qualitative approach. 2nd ed. Chapman & Hall; 1996.
- Imkome E, Soonthornchaiya R, Moonchai K. Semi-structured interview questions (Experiences of caring persons with COVID-19: A qualitative study in Thailand). Figshare. 2024. https://doi.org/10.6084/m9.figshare.25464862.v1
- Polit DF, Beck CT. Nursing research: generating and assessing evidence for nursing practice. 9th ed. Wolters Kluwer Health/Lippincott Williams & Wilkins; 2012.
- Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Res Psychol. 2006;3(2):77–101. https://doi.org/10.1191/1478088706qp063oa.
- Fusch PI, Ness LR. Are we there yet? Data saturation in qualitative research. The Qualitative Report. (2015);20(9):1408–1416. Available from https://www.n suworks.nova.edu/tqr/vol20/iss9/3
- 24. Lincoln YS, Guba EG. Naturalistic inquiry. Sage; 1985.
- 25. Given LM. The SAGE encyclopedia of qualitative research methods. SAGE Publications, Inc; 2008. https://doi.org/10.4135/9781412963909.
- 26. Smith JA, Flowers P, Larkin M. Interpretative phenomenological analysis: Theory, method and research. SAGE; 2022.

- Smith B, McGannon KR. Developing rigor in qualitative research: problems and opportunities within sport and exercise psychology. Int Rev Sport Exerc Psychol. 2018. https://doi.org/10.1080/1750984X.2017.1317357.
- Groenewald T. A phenomenological research design illustrated. Int J Qualitative Methods. 2004. https://doi.org/10.1177/160940690400300104.
- Ali H, Cole A, Ahmad XX, Hamasha S, Panos G. Major stressors and coping strategies of frontline nursing staff during the outbreak of coronavirus disease 2020 (COVID-19) in Alabama. J Multidiscip Healthc. 2020;13:2057–68.
- Zhang H, Chen H, Wang Y. The psychological impact of COVID-19 on nurses: A systematic review and meta-analysis. Int J Nurs Stud. 2021;120:103165. http s://doi.org/10.1016/j.ijnurstu.2021.103165.
- Zhang Y, Li Y, Chen H, Li J. Nurses' work satisfaction and coping strategies during the COVID-19 pandemic: A cross-sectional study. Nurs Open. 2022;9(1):158–68. https://doi.org/10.1002/nop2.664.
- Cummings GG, Lee H, Tate K, McCabe C, Wong CA. The impact of COVID-19 on nursing workforce: A qualitative study of health system leaders. Int J Nurs Stud. 2021;118:103939. https://doi.org/10.1016/j.ijnurstu.2021.103939.
- Labrague LJ, McEnroe–Petitte DM, Leocadio MC, Van Bogaert P. Stress and ways of coping among nurse managers: A systematic review. J Nurs Adm Manag. 2021;29(3):613–22. https://doi.org/10.1111/jonm.13103.
- Cowger TL, Kowal JK, DeYoung J, Duhamel K. Nurses' experiences of stress, coping, and resilience during the COVID-19 pandemic: A qualitative study. Int Nurs Rev. 2021;68(1):115–23. https://doi.org/10.1111/inr.12640.

- Sharma M, Gupta N, Sahu K. Psychological impact of the COVID-19 pandemic on healthcare workers in India: A cross-sectional study. Int J Nurs Stud. 2021;121:104004. https://doi.org/10.1016/j.ijnurstu.2021.104004.
- Ebrahim SH, Karamouzian M, Rojas JR. Resilience in health care workers amidst the COVID-19 pandemic: A qualitative analysis. BMC Health Serv Res. 2021;21(1):123. https://doi.org/10.1186/s12913-021-06183-8.
- Tolomiczenko GS, Kahan M, Ricci M, Strathern L, Jeney C, Patterson K, et al. SARS: coping with the impact at a community hospital. J Adv Nurs. 2005;50:101–10. https://doi.org/10.1111/j.1365-2648.2005.03366.x.
- Geoffroy PA, Le Goanvic V, Sabbagh O, Richoux C, Dufayet G, Lejoyeux M. Psychological support system for hospital workers during the Covid-19 outbreak: rapid design and implementation of the Covid-Psy hotline. Front Psychiatry. 2020;11:511. https://doi.org/10.3389/fpsyt.2020.00511.

# **Publisher's note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.