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# Stress, adversity quotient, and health behaviors of undergraduate students in a Thai university during COVID-19 outbreak

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Bovornpot Choompunuch<sup>1</sup>, Wanich Suksatan<sup>2,3\*</sup>, Jiraporn Sonsroem<sup>1</sup>, Siripong Kutawan<sup>1</sup>, and Atittiya In-udom<sup>1</sup>

## Abstract

**Background:** University students are an essential human resource for national development. Thus, it is important to study the stress, adversity quotient, and health behaviors of these students during the COVID-19 pandemic.

**Objective:** This study aimed to identify stress, adversity quotient, and health behaviors and examine the relationship between these factors in undergraduate students during the COVID-19 outbreak.

**Methods:** The current study was a quantitative study with a cross-sectional design conducted from 27 November to 10 December 2020. A total of 416 undergraduate students in a Thai university were selected using a convenience sampling technique. A questionnaire was used to collect the data on stress, adversity quotient, and health behaviors of undergraduate students during the COVID-19 outbreak. Data were analyzed using mean, standard deviation, and Pearson's Product Moment Correlation Coefficient.

**Results:** This study indicated that stress was at a high level ( $3.54 \pm .53$ ; Mean  $\pm$  SD), adversity quotient was at a high level ( $3.77 \pm .63$ ; Mean  $\pm$  SD), and health behaviors were at a moderate level ( $3.06 \pm .53$ ; Mean  $\pm$  SD). The current study also found that stress and adversity quotient were irrelevant. Stress and health behaviors were negatively correlated with a level of significance of .01 ( $r = -.31$ ), and adversity quotient and health behaviors were positively correlated with a level of significance of .01 ( $r = .051$ ).

**Conclusion:** It is suggested that healthcare providers, families, and professors should consider stress and adversity quotient in developing interventions to promote healthy behaviors in terms of physical and psychological factors in university students.

## Keywords

stress; adversity quotient; health behaviors; COVID-19; outbreak; undergraduate students

In December 2019, the first cases of COVID-19 were found in the city of Wuhan, Hubei Province, China (Hou et al., 2020). Several researchers collected samples from patient's airways and revealed the presence of a novel strain of coronavirus (Tan et al., 2020). The World Health Organization (2020a) announced that the novel coronavirus was considered a pandemic due to its rapid spread. In every region of the world, people infected with

the new coronavirus first developed symptoms of fever and dry cough; after a week, the patient experiences shortness of breath. COVID-19 causes pneumonia and is accompanied by inflammation that may be severe and can lead to internal organ failure (World Health Organization, 2020a). As of June 2020, the COVID-19 patients had increased to more than 6.5 million people infected with the novel coronavirus worldwide, and there had been 380,000

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deaths (World Health Organization, 2020b). Following this outbreak, people around the world have difficulty in living their lives. For example, COVID-19 causes stress, coping, problem-solving, isolation, loneliness, and depression (Amaral-Prado et al., 2020; Kong et al., 2020), which influence students' health behaviors (Xiong et al., 2020). These psychological and emotional issues may affect their study patterns, graduation, and employment status in the future (Ministry of Public Health, 2020).

Currently, universities in Thailand offer a wide range of Thai and international programs for Thai and overseas students, ranging from undergraduate, graduate studies and several short training courses. The COVID-19 pandemic is an important opportunity to manage education in the "new normal" way, a large conceptual shift that must be aligned and connected to the learning of students (Sahu, 2020). COVID-19 brings not only life crisis but also psychological stress - tension, anxiety, sadness, and fear - among the patients, students, and healthcare providers (Song, 2020). To deal with the COVID-19 crisis, Thailand is trying to reduce the pandemic (Din et al., 2020; Ketphan et al., 2020) by hand hygiene, personal and social distancing, wearing masks, early detection of COVID-19, and also the isolation of patients (Malathum & Malathum, 2020; Velavan & Meyer, 2020).

Stress is a physical and psychological response that results from internal or external stimuli (Turner et al., 2020; Wu, Zhang, et al., 2020). It is associated with changes in body systems that affect a person's mental health and behavior, such as palpitations, sweating, dry mouth, and shortness of breath (Impey et al., 2020; Yang et al., 2020). During the COVID-19 pandemic, it is inevitable that a person will be exposed to stress, which is a normal response to the situation of the COVID-19 crisis and can affect different people, including university students who are at risk of mental health problems (Sahu, 2020).

University students are considered significant human resources for national development (Pacnoy et al., 2017; Suksatan, Ruamsook, et al., 2020). Students in health science curriculums will have future responsibilities for providing all aspects of care to patients - physically, mentally, emotionally, socially, and spiritually - in disease prevention and health promotion (Mullan et al., 2017; Suksatan, Choompunuch, et al., 2020). The students also have to collaborate and coordinate with professional colleagues from different professions (Bronstein et al., 2010; Mueanwaja et al., 2018). Therefore, it is the responsibility of higher education institutions to produce graduates with advanced academic and practical knowledge and enable them to become effective professionals in the future (Suksatan, Ruamsook, et al., 2020).

University students report more significant health behaviors and mental health problems, including increased stress levels, than non-students (Savitsky et al., 2020). The COVID-19 outbreak might have serious consequences for university students who are experiencing significant disruptions in teaching and assessment during the mid-and

final-semester exams of their studies. The students might graduate late because of the postponement of examinations. In addition, students will face the severe challenges of the global recession caused by the COVID-19 pandemic. For the above reasons, the study aimed to examine the stress, adversity quotient, and health behavior levels and examine the relationship between these factors influencing undergraduate students during the COVID-19 outbreak.

## Methods

### Study Design

A cross-sectional study was conducted to examine the stress, adversity quotient, and health behaviors of undergraduate students during the COVID-19 outbreak in Thailand.

### Setting and Sample

Undergraduate students were selected from Mahasarakham University in Thailand. The research was conducted in the first semester of the academic year. This study included undergraduate students aged more than 18 years old, both male and female, studying at the university and registered in the academic year 2020 of Mahasarakham University in Thailand. Exclusion criteria were students not willing to participate and could not speak or write in the Thai language. This study used the G\*power program (Faul et al., 2007) to calculate the sample size. A total of 416 participants were selected from the target population using a convenience sampling technique.

### Instruments

The questionnaire adapted from reviewing literature and the previous studies were classified into four parts as follows:

The questionnaire on the student's characteristics consisted of 4-item multiple choices and open-ended questions, developed by the researcher, including gender, academic year, currently studying faculties/ colleges, and average monthly income.

*The Coronavirus Stress for Undergraduate Students Scale (CSUSS)* was developed by the researchers. The scale consisted of 15 items. Respondents indicate their choices on a 5-point scale from 1 = low to 5 = most. Total CSUSS scores can range from 15 to 75. Higher scores indicate higher stress. Cronbach's alpha coefficient was .84 for the pilot study and .86 for the main study.

*The Coronavirus Adversity Quotient Scale (CAQS)* was developed by the researchers. The scale consisted of 17 items. Participants indicate their choices on a 5-point scale from 1 = low to 5 = most. Total CAQS scores can range from 15 to 85. Higher scores indicate a higher adversity quotient. Cronbach's alpha coefficient was .86 for the pilot study and .93 for the main study.

*The Health Behaviors Scale*, developed by the Health Education Division (Health Education Division; Health Service Support Department (2013), consisted of 18 items.

Participants indicate their choices on a 5-point scale from 1 = low to 5 = most. Total HBS scores can range from 18 to 95. Higher scores indicate a higher adversity quotient. Cronbach's alpha coefficient was .84 for the pilot study and .82 for the main study.

### Data Collection

Data were collected during 27 November – 10 December 2020. We used a convenience sample of eligible undergraduate students who were willing to participate in the study. Participants were recruited in seven faculties/colleges and within the Mahasarakham University community by collecting the survey and recruitment statement to the students. The participants then signed a consent form, and each student spent around 15-20 minutes completing the self-report questionnaires. The principal investigator (PI) and co-principal investigator (Co-PI) checked all questionnaires, and if an incomplete questionnaire was found, the participant was asked to complete the questionnaire. However, respondents who were not willing to participate could withdraw anytime.

### Data Analysis

Descriptive statistics or IBM® SPSS® version 21 were used to analyze the data and describe the demographic characteristics of the participants. Pearson's Product Moment Correlation Coefficient was conducted to examine

correlations of stress, adversity quotient, and health behavior during COVID-19 outbreak variables. Statistical significance was set at  $<.05$ .

### Ethical Considerations

The present study was approved by the Ethical Committee from Mahasarakham University (IRB No. 297/2563) and the directors of seven faculties/colleges. Each participant received explanations about the study and had their rights protected throughout, including confidentiality and the right to refuse or withdraw from the study. The participants also received information sheets and signed a consent form.

## Results

### Characteristics of the Participants

As shown in Table 1, the majority of the participants were female, 71.90% ( $n = 299$ ), the largest percentage of participants were first-year undergraduate students (43.30%), and the majority of participants were the students in the College of Politics and Governance (25.20%). Most participants lived in the northeast region of Thailand (95.09%), and the majority of monthly household incomes were 330 – 500 US dollars (33.40%). The most common occupation of the custodians of participants was agriculturist (28.40%).

**Table 1** Characteristics of the participants ( $N = 416$ )

Demographic characteristics	N	%
<b>Gender</b>		
Male	117	28.10
Female	299	71.90
<b>Education level (Year)</b>		
First	180	43.30
Second	87	20.90
Thirty	64	15.40
Forth	76	18.30
Fifth	9	2.20
<b>Faculty/College</b>		
Faculty of Education	79	19.00
Faculty of Tourism and Hotel Management	84	20.20
College of Politics and Governance	105	25.20
Faculty Architecture, Urban Design, and Creative Arts	38	9.10
Faculty of Informatics	75	18.00
Faculty of Public Health	25	6.00
Faculty of Nursing	10	2.40
<b>Hometown (region)</b>		
Northeast	387	95.09
Central	14	3.44
South	3	.74
North	2	.49
Eastern	1	.25
<b>Household monthly income (US dollar)</b>		
< 330	68	16.30
330 – 350	139	33.40
350 - 660	79	19.00
660 - 830	29	7.00
830 – 1,000	31	7.50
> 1,000	70	16.80

**Table 1** (Cont.)

<b>Custodian's occupation</b>			
Civil servant	56	13.50	
State employee	12	2.90	
Businessperson / trade	91	21.90	
Agriculturist	118	28.40	
Employment	97	23.30	
Unemployment	5	1.20	
Other (e.g., prefer not to answer)	37	8.90	

**Descriptive Characteristics of the Study Variables**

Based on Table 2, the overall stress of the participants was at a high level ( $3.54 \pm .53$ ; Mean  $\pm$  SD). Table 3 also showed that most undergraduate students during the COVID-19 outbreak experienced an adversity quotient at a high level ( $3.77 \pm .63$ ; Mean  $\pm$  SD). Similarly, the

participants showed high levels of each component of adversity quotient of undergraduate students such as control of obstacles or problems ( $3.64 \pm .70$ ; Mean  $\pm$  SD), cause and responsibility ( $3.68 \pm .63$ ; Mean  $\pm$  SD), impact side ( $3.97 \pm .89$ ; Mean  $\pm$  SD), and durability ( $3.79 \pm .92$ ; Mean  $\pm$  SD).

**Table 2** Descriptive statistics of stress level of undergraduate students ( $N = 416$ )

Variable	Mean	SD	Interpretation by mean
Stress level	3.54	.53	High
<b>Overall stress level</b>	<b>3.54</b>	<b>.53</b>	<b>High</b>

**Table 3** Descriptive statistics of adversity quotient of undergraduate students

Variables	Mean	SD	Interpretation by mean
Control of obstacles or problems	3.64	.70	High
Cause and responsibility	3.68	.63	High
Impact side	3.97	.89	High
Durability	3.79	.92	High
<b>Overall</b>	<b>3.77</b>	<b>.63</b>	<b>High</b>

Based on Table 4, it was found that overall health behavior was at a moderate level ( $3.06 \pm .53$ ; Mean  $\pm$  SD). Similarly, the participants showed high levels of behavior of illness and medical treatment ( $2.91 \pm .80$ ; Mean  $\pm$  SD), health-

promoting behavior ( $3.51 \pm .66$ ; Mean  $\pm$  SD), therapeutic behavior, and participatory behavior ( $3.21 \pm .71$ ; Mean  $\pm$  SD).

**Table 4** Descriptive statistics of health behavior of undergraduate students ( $N = 416$ )

Health Behavior	Mean	SD	Interpretation by mean
Illness and medical treatment behavior	2.91	.80	Moderate
Health-promoting behavior	3.51	.66	High
Therapeutic behavior	2.75	.74	Moderate
Participatory behavior	3.21	.71	Moderate
<b>Overall</b>	<b>3.06</b>	<b>.53</b>	<b>Moderate</b>

**Factors Explaining Health Behavior of Undergraduate Students**

Based on Table 5, stress ( $r = -.31$ ), adversity quotient ( $r = .51$ ) had statistically significant relationships with health

behaviors ( $p < .001$ ). However, stress had no significant relationship with the adversity quotient.

**Table 5** Correlation Between the Study Variable ( $N = 416$ )

Variables	Stress (r)	Adversity quotient (r)	Health behavior (r)
Stress	1.00	-0.02	-.31**
Adversity quotient		1.00	.51**
Health behavior			1.00

\*\*  $p$ -value = .01



## Discussion

This study aimed to examine stress, adversity quotient, and health behaviors and their relationship in undergraduate students during the COVID-19 outbreak. This study found that the overall stress of undergraduate students during the pandemic situation of COVID-19 was at a high level. The findings of this study reinforced previous reports that stress is a factor that negatively and directly correlated with health behavior in undergraduate students (Pellegrini et al., 2020; Wu, Xu, et al., 2020; Ye et al., 2020). In the current study, the participants showed a high-stress level. This result may indicate that students' stress management and health behavior changed under the COVID-19 pandemic. Both Thai and foreign students from various areas have returned to the university. The students may be more prone to COVID-19 infection, stress, and paranoia that can lead to the epidemic or university life. In terms of organizing activities on campus, it is important to limit the number of students and to reduce overcrowded activities. Students experience stress from being in their home even after preventative measures have been taken. However, they are still worried about attending class or travel and the return of the outbreak in a second or third phase of infection. In addition, income loss, parental income impact, government assistance, and the unavailability of a vaccine were concerns and causes of stress (Carroll et al., 2020; Pietrobelli et al., 2020).

The results of this study showed that the adversity quotient of undergraduate students was at a high level. The results are consistent with those of Kurniawan et al. (2020) found that the adversity quotient can contribute to forming a student's career maturity (4.7%). Furthermore, this result is similar to previous studies reporting that the adversity quotient was positively associated with health behavior in undergraduate students (Shek, 2020; Siahna, 2020). Therefore, it is suggested that students were aware of the epidemic in other countries and had taken precautions such as preparing personal protective equipment, consumer products, and pharmaceutical products. Most universities in Thailand had sudden shutdowns to control the COVID-19 situation. Therefore, the university allowed students to return to their domicile and comply with government measures (Imsa-Ard, 2020). When students returned to their homeland, they could spend more time with their families and plan for their daily lives in terms of purchasing consumer products, consumption, and transportation (Loxton et al., 2020). In addition, in Thai society, assistance comes from every corner whenever there is a crisis. Laypersons create several charity boxes or "Pun Sook" in each community nationwide where people can put food, medicines, or other necessities. Anyone can get them without spending any cost (Malathum & Malathum, 2020).

This study found that the level of health behavior in undergraduate students was at a moderate level. The findings of this study are similar to prior international studies, which reported that 36.5% of the participants had positive health behaviors that were associated with

increased engagement such as exercise, sleep, of which 61% were most commonly attributed to more time being available and to stress relief (Kneil et al., 2020). Indeed, the findings of this study are similar to several studies that were conducted on other populations and non-communicable diseases, which indicated a moderate level of health behavior (Ounprasertsuk et al., 2020; Suksatan & Ounprasertsuk, 2020). In addition, the adversity quotient refers to a state of serious and continued incumbrance, including the COVID-19 crisis. Several students, particularly undergrad students, encountered hardships at university or society (Tian & Fan, 2014).

This study has several potential limitations. First, the sample size in the seven faculties/colleges was homogeneity of the sample, so the comparison among variables could be ambiguous. Second, participants were recruited and conducted at Mahasarakham University, which may have omitted relevant studies conducted in other universities and other countries. Finally, data collection was based on self-report questionnaires. There is the potential for response bias because the PI and Co-PIs were checking the questionnaires; thus, students might have felt pressured to answer the questions. However, the study also has some strengths. It was the first study in Thailand to study stress, adversity quotient, and health behaviors using performance tests and validated instruments with a large sample of undergraduate students. Furthermore, this study also provided factors associated with the health behaviors of undergraduate students during the COVID-19 pandemic in a Thai university. Future studies might also use the CSUS and CAQS instruments to maintain validity in measuring stress and adversity quotient toward health behaviors in general and is relatively reliable.

## Conclusion

During COVID-19 and its global change, education has been significantly challenged by using online learning for students. The adjustment of students took into account significant factors such as stress, adversity quotient, and health behaviors to overcome barriers during the transition period; these effects have impacted schools around the world and have had some important results on undergraduate students living in Thailand during the COVID-19 outbreak. Interestingly, this study found that the overall stress of undergraduate students during the epidemic situation of COVID-19 was at a high level. It is recommended that nurses, healthcare providers, families, and professors consider these factors in developing interventions to promote healthy behaviors in terms of physical and psychological factors in university students.

### Declaration of Conflicting Interest

The authors declare no conflict of interest.

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#### Author Contribution

B.C. and W.S. drafted the article, conducted a review of the literature. J.S., S.K., and A.I. conducted the data and data analysis. B.C. and W.S. contributed to the design and concept, reviewed and revised the manuscript. All authors agreed with the final version of the article.

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#### Data Availability Statement

All data generated or analyzed during this study are included in this published article. The data sets of this study are not publicly available due to the information that could compromise the research participants' privacy.

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# Holistic nursing care among operating room nurses: Strengthening the standard of practice in Saudi Arabia

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## Abstract

**Background:** Holistic practices have been found beneficial for patients as well as nurses. They increase both the nurses and the patients' health-promoting behaviors, spirituality, and interpersonal relationships.

**Objective:** This study aimed to determine holistic nursing care and compare its differences based on individual characteristics.

**Methods:** This study employed a quantitative-cross sectional approach. It was conducted at the hospitals of Hail region, Kingdom of Saudi Arabia, from February 2020 to March 2020. Selected through convenience sampling, 154 operating room nurses participated in the study. Frequency and percentages were used to analyze the demographic information, and *t*-tests and analysis of variance were used to test for differences.

**Results:** Holistic nursing dimensions such as physiological ( $4.72 \pm 0.40$ ), socio-cultural ( $4.53 \pm 0.45$ ), psychological ( $4.66 \pm 0.32$ ), and spiritual aspects ( $4.22 \pm 0.73$ ) were consistently carried out in the operating room. On the physiological dimension, no significant differences were found in years of experience [ $(t) -0.073$ ;  $p > 0.942$ ], gender [ $(t) -1.113$ ;  $p > 0.27$ ], or age [ $(F) 0.558$ ;  $p > 0.57$ ], but there was a significant difference with nationality [ $(t) -3.328$ ;  $p < 0.001$ ]. On the socio-cultural dimension, the length of experience [ $(t) 0.599$ ;  $p > 0.550$ ], gender, [ $(t) -1.420$ ;  $p > 0.158$ ], and age [ $(F) 0.148$ ;  $p > 0.862$ ] were not significant, but a significant difference was found with nationality [ $(t) -7.516$ ;  $p < 0.001$ ]. Regarding the psychological dimension, the length of experience [ $(t) -1.101$ ;  $p > 0.276$ ], gender [ $(t) -1.545$ ;  $p > 0.129$ ], and age [ $(F) 1.259$ ;  $p > 0.287$ ] were not significant, but there was a significant difference with nationality [ $(t) -5.492$ ;  $p < 0.001$ ]. Finally, with the spiritual dimension, no significant difference was found on length of experience [ $(t) -1.101$ ;  $p > 0.276$ ] or age [ $(F) 0.584$ ;  $p > 0.559$ ], but there were significant differences on gender [ $(t) -3.890$ ;  $p < 0.001$ ] and nationality [ $(t) -3.653$ ;  $p < 0.001$ ].

**Conclusion:** Nationality is a causal factor to physiological, socio-cultural, psychological, and spiritual dimensions, while gender is significant to spiritual aspect. Regardless of nationality or gender, nurses must be knowledgeable regarding the significance of adopting holistic care to improve the quality of their care to their patients.

## Keywords

holistic nursing; operating room; nursing; spirituality; Saudi Arabia

Caring has been continually regarded as the heart of the nursing profession. Nurses are expected to provide professional and competent nursing skills with exceptional care and compassion for patients. Accordingly, nurses

integrate compassionate behavior with the condition of the patients by supporting those patients, forming mutual relationships, and making a difference in their lives, thus portraying nursing as both an art and a science (Henry,

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2018). It is assumed that it always transforms to quality care when nurses engage in professional principles and the application of professional expertise. To Kinchen (2015), caring in nursing traditionally employs a holistic approach. Holistic nursing care goes back to the time of Florence Nightingale when the healing process was influenced by the patient's environment. This concept has expanded as aspects of the physical, social, psychological, and spiritual have been taken into consideration (Tjale & Bruce, 2007). Holistic nursing care is integrally composed of therapeutic interactions by the nurse and the patient, the communication patterns, and the patient preference (Dossey, 2009). According to Mariano et al. (2013), holistic nursing heals the whole person with the incorporation of caring. Holistic practices are beneficial for the patients and the nurses, increasing the health-promoting behaviors, spirituality, interpersonal relations, and nutrition (Mcelligott et al., 2010).

Although care is essential in all nursing fields, the operating room poses the most difficulty in terms of rendering holistic nursing care. The operating room is a fast-paced hospital area; in constant change, it is highly demanding and schedule-driven. These characteristics present a challenge for perioperative nurses to possess good critical thinking and decision-making skills while simultaneously delivering holistic nursing care (Cohen, 2008). Consequently, in managing operating room employees, nursing managers must strategize for an excellent workforce (Alshammari et al., 2020; Gunawan et al., 2020). Operating room nurses face numerous challenges in the operating room arena; they are pressured physically, mentally, and emotionally, which leads to increased pressure and high medical risks (Higgins & Macintosh, 2010). A range of different problems (e.g., technical, equipment/patient) results in an increase in stress to operating room personnel, ultimately affecting their performance and care (Arora et al., 2010). Communication failures among the surgical team and equipment problems result in procedure delays and inefficiencies (Halverson et al., 2011). Incontrovertibly, perioperative nurses have a multitude of concerns that compromise the value of the care given to the patient. Patient safety breaches, for instance, have been the result of system failures, including failure of the equipment due to design and use, inadequate staffing, miscommunication, and poor team coordination inside the operating room (Van Beuzekom et al., 2012).

Since holistic nursing care in the operating room context starts from the time the patient consents for surgery until his or her discharge in the hospital, the Joint Commission established steps to prevent surgical errors and promote patient safety (Joint Commission, 2009). Perioperative nurses aim to avert physical and psychological complications related to surgery and assist in the resumption of the patient to normal (Selimen & Andsoy, 2011). Albaqawi et al. (2017) note that the diversity of cultures poses a difficulty for nurses in achieving holistic caring expectations in the Arab context.

These problems are due to values considerations, gender segregation among the patients and staff, and family and tribal relationships. Jasemi et al. (2017) postulated that holistic care is an unfamiliar concept in Iran and that a philosophical shift is needed to encourage nurses to reflect on their roles. This is both within the healthcare team, and it is to enhance their contributions to patient care beyond that of being assistants to doctors. To Holt-Waldo (2011), an observable change in the interventional methods can be seen once holistic nursing is employed. While holistic care is assumed to be an all-inclusive context, previous studies demonstrate that nurses do not apply holistic care well (Zamanzadeh et al., 2015).

This study is important because it deals with the determination of holistic care practice in the Arab context. Exploring the holistic care employed by the nurses helps to determine what needs to be improved in their caring practices that use this model. To this end, the nurses engaged themselves in using holistic care in examining themselves through this study. The study aimed to determine holistic nursing care and to compare its differences based on individual characteristics.

## Methods

### Study Design

This study employed a quantitative-cross sectional design.

### Setting

The study was conducted in the operating rooms of the hospitals of the Hail region of Saudi Arabia. The researchers utilized the total population sampling for the hospitals. The hospitals were King Khalid Hospital, Hail General Hospital, Maternity Hospital, King Salman Hospital, and Saudi German Hospital.

### Participants

The study participants were operating room nurses, 154 in total. The researchers set the inclusion criteria as nurses who had been assigned to the operating room permanently and who had direct contact with the patients for surgery. Intern nurses, regular employee nurses who were on leave, and nurses who were not willing to participate were excluded from the study. The non-probability sampling, specifically convenience sampling, was utilized in this investigation due to participants' accessibility. The Raosoft sample size calculator ([http://www.raosoft.com/sample\\_size.html](http://www.raosoft.com/sample_size.html)) was used to determine the sample needed in this study. Through convenience sampling, using a 5% margin of error and a 95% level of confidence, of 254 operating room nurses, only 154 served as participants.

### Instrument

The researchers utilized a researcher-made tool because there is no explicit tool available to determine the holistic practices of nurses in the operating room. The composition of the tool was based on the holistic care theory, literature from similar studies, and the opinions of experts. The tool

was composed of a 20-item statement that was divided into four dimensions. These included the physiological dimension with five statements (e.g., Do you identify the patient for operation accurately?), the socio-cultural with five statements (e.g., Do you respect cultural differences that may affect opinions, values, and beliefs of the patient and his or her family?), the psychological dimension with five statements (e.g., Do you assess the patient's knowledge and understanding of the surgery?), and the spiritual with five statements each (e.g., Do you encourage patients to pray before surgery?). These statements were rated using a five-point Likert scale with the corresponding verbal interpretations: 5 – Every time, 4 – Almost every time, 3 – Sometimes, 2 – Almost never, and 1 – Never. Higher mean scores indicate a consistent demonstration of holistic care. The scale measurement and verbal interpretations utilized in the analysis of data were 1–1.5 (Never), 1.51–2.5 (Almost never), 2.51–3.5 (Sometimes), 3.51–4.5 (Almost every time), and 4.51–5 (Every time).

Since most nurses can comprehend and speak English, the researcher-made questionnaire was in the English language. The tool was subjected to face validity by five experts in the field. Two had a doctorate in psychology and work as psychometricians in a university; one is a doctor of nursing practice working in the hospital, and the other two are nursing directors of continuing nursing education. Suggestions were implemented in the final draft. Content validity was conducted, resulting in 0.77 for the relevance score of 0.78 for clarity. These results indicate a high level of content validity. The tool was tested with 15 operating room nurses for reliability, resulting in a reliability coefficient of 0.70. This means that the tool was reliable.

### Data Collection

With the approval of the hospital authorities, the researchers conducted a face-to-face orientation with the operating room nurses to explain the purpose of the study, their rights, the benefits, and the extent of their participation. The researchers personally handed the questionnaires to the participants, and they were given two days to answer it considering the nature of their work and their schedule. The data was gathered from February 2020 through March 2020.

### Data Analysis

The data were examined using SPSS version 25. The normality test using the Kolmogorov-Smirnov test revealed 0.73, which means that data are normally distributed. The frequency distribution and percentages were used to determine the demographic profile of the respondents. The weighted mean was used to determine the holistic nursing care practices of the respondents in the operating room. The *t*-test and the analysis of variance (ANOVA) were used to determine the presence of a significant difference, if any, between the holistic nursing care practices of the respondents when grouped according to the demographic variables included in the study.

### Ethical Consideration

This research received ethical clearance from the University of Ha'il. Written informed consent was included in the survey instrument, which the participants need to sign before they can proceed to answer. The rights, benefits, anonymity, and confidentiality of the participants were all fully ensured throughout the entire course of the research process.

## Results

Most of the participants were in the age range of 31 to 35 (48.7 %), followed by 36 years and above (31.8%). The majority were female (83.1%); 50 percent were Saudi, and 50 percent were non-Saudi. Regarding the length of experience, 76 percent of the participants had six or more years of experience (Table 1).

**Table 1** Demographic information of the participants

Demographic Information	Frequency	Percentage
<b>Age (years)</b>		
25-30	30	19.5
31-35	75	48.7
36 and above	49	31.8
<b>Gender</b>		
Male	26	16.9
Female	128	83.1
<b>Nationality</b>		
Saudi	77	50
Non-Saudi	77	50
<b>Length of experience (years)</b>		
Less than five years	37	24
Six years and above	117	76

The participants perceived that holistic dimensions such as physiological ( $4.72 \pm 0.40$ ), socio-cultural ( $4.53 \pm 0.45$ ), psychological ( $4.66 \pm 0.32$ ), and spiritual ( $4.22 \pm 0.73$ ) were consistently carried out in the operating room (Table 2).

**Table 2** Overall mean and standard deviation of the holistic dimension

Holistic Dimension	Mean	SD	Remarks
Physiological	4.72	0.40	Every time
Socio-cultural	4.53	0.45	Every time
Psychological	4.66	0.32	Every time
Spiritual	4.22	0.73	Every time

*SD= standard deviation*

Table 3 shows the differences in the demographic information of the participants regarding the physiological, socio-cultural, psychological, and spiritual dimensions. On the physical dimension, no significant differences were found in years of experience [ $t( ) -0.073$ ;  $p > 0.942$ ], gender [ $t( ) -1.113$ ;  $p > 0.27$ ], or age [ $F( ) 0.558$ ;  $p > 0.57$ ], but there was a significant difference regarding the nationality of the participants [ $t( ) -3.328$ ;  $p < 0.001$ ].

Regarding the socio-cultural dimension, the length of experience [ $t( ) 0.599$ ;  $p > 0.550$ ], gender, [ $t( ) -1.420$ ;  $p$



0.158], and age [(F) 0.148;  $p > 0.862$ ] were not significant. However, a significant difference was found regarding the nationality [(t) -7.516;  $p < 0.001$ ] of the participants.

Regarding the psychological dimension, there were no significant differences regarding length of experience [(t) -1.101;  $p > 0.276$ ], gender [(t) -1.545;  $p > 0.129$ ], or age [(F)

1.259;  $p > 0.287$ ], however, there was a significant difference with nationality [(t) -5.492;  $p < 0.001$ ].

With the spiritual dimension, no significant difference was found on the length of experience [(t) -1.101;  $p > 0.276$ ] or age [(F) 0.584;  $p > 0.559$ ], but there were significant differences on gender [(t) -3.890;  $p < 0.001$ ] and nationality [(t) -3.653;  $p < 0.001$ ].

**Table 3** Differences on the demographic information as to physical, social, psychosocial, and spiritual dimension

		Mean	SD	Test Value	df	p
Physiological dimension						
Length of experience (years)	Less than five years	4.72	0.44	(t) -0.073	152	0.942
	Six years and above	4.72	0.39			
Gender	Male	4.63	0.51	(t) -1.113	30.82	0.274
	Female	4.74	0.37			
Nationality	Saudi	4.62	0.47	(t) -3.328	129.54	0.001*
	Non-Saudi	4.83	0.29			
Age	25-35	4.71	0.44	(F) 0.558	153	0.573
	36-45	4.76	0.36			
	46 and above	4.68	0.44			
Socio-cultural dimension						
Length of experience (years)	Less than five years	4.57	0.44	(t) 0.599	152	0.550
	Six years and above	4.52	0.46			
Gender	Male	4.42	0.45	(t) -1.420	152	0.158
	Female	4.56	0.45			
Nationality	Saudi	4.77	0.33	(t) -7.516	140.77	0.001 *
	Non-Saudi	4.53	0.32			
Age	25-35	4.58	0.42	(F) 0.148	153	0.862
	36-45	4.52	0.47			
	46 and above	4.53	0.45			
Psychological dimension						
Length of experience (years)	Less than five years	4.73	0.29	(t) 1.463	152	0.145
	Six years and above	4.64	0.33			
Gender	Male	4.59	0.24	(t) -1.545	46.45	0.129
	Female	4.68	0.34			
Nationality	Saudi	4.53	0.32	(t) -5.492	152	0.001*
	Non-Saudi	4.80	0.28			
Age	25-35	4.62	0.34	(F) 1.259	153	0.287
	36-45	4.70	0.29			
	46 and above	4.62	0.36			
Spiritual dimension						
Length of experience (years)	Less than five years	4.09	0.86	(t) -1.101	51.57	0.276
	Six years and above	4.26	0.69			
Gender	Male	3.73	0.78	(t) -3.890	152	0.001*
	Female	4.32	0.69			
Nationality	Saudi	4.01	0.78	(t) -3.653	145.15	0.001*
	Non-Saudi	4.43	0.63			
Age	25-35	4.21	0.69	(F) 0.584	153	0.559
	36-45	4.29	0.75			
	46 and above	4.22	0.74			

\*significant at 0.05; df= degrees of freedom

## Discussion

This study aimed to determine the level of demonstration of holistic nursing among the staff nurses in the operating rooms of the hospitals of Hail, Saudi Arabia. Overall, the staff nurses perceived that holistic dimensions such as the physiological, socio-cultural, psychological, and spiritual were consistently demonstrated. This indicates that the staff nurses provide care to patients based on a mutual

comprehension of their physical, psychological, socio-cultural, and spiritual aspects. This supports a study conducted previously in which nurses received performance ratings of "very good" and "excellent" in their holistic care (Albaqawi et al., 2017). In this study, the nurses were mindful of the realities of physiological care and that nurses and patients collaborate on healthcare demands that lead to recovery.

Regarding the socio-cultural dimension, the nurses understood that reverence of culture is required for the

patients and their families. This validates the studies of both [Sevinç et al. \(2016\)](#) and [Almutairi et al. \(2015\)](#), wherein values, language, and norms are essential for the nurses to communicate and understand their patients. Since the patient is unconscious, the psychological aspects of holistic care may not be apparent in an operating room. Nevertheless, important concerns must be taken into consideration before the surgery. For instance, nurses conveyed the essential instructions regarding the post-operation management of pain ([Panlican et al., 2020](#)). In this context, nurses were obliged to enlighten the patients regarding their illness, to assess their psychological capacity, and to inform them of accessible alternatives to handling their illness ([Al-Mutair et al., 2014](#)).

Spiritual care focuses on the patients' belief that nurses are mindful of its importance in line with delivering holistic care. According to [Gore \(2013\)](#), addressing spiritual care includes active listening, therapeutic touch, and assistance on spiritual activities. The demographic traits, working environment, and educational system are the primary aspects when caring for a patient holistically. These provisions of holistic care have been demonstrated in earlier studies ([Shiao et al., 2019](#); [Zamanzadeh et al., 2015](#)). Such a finding indicates the need for closer attention to the educational system, including adjustment and modification of the course in the nursing curriculum to intensify the holistic care. In addition, nurses should create an atmosphere capable of providing holistic treatment, understand the socio-cultural and social condition of the patient, and be intimately familiar with their family and living environment. To develop holistic caring, the congruence between the identities of the nurses and their discipline, the development of their communicative abilities, and the promotion of involvement in the practice of nurses and nursing students must be appreciated. Nurses can utilize holistic nursing care to enhance the lives of the patients and their own lives. The key is not necessarily about how long the nurses spend interacting with a patient, but about how the nurses use their time with them.

In this study, no significant differences were found in the physiological, socio-cultural, or psychological with years of experience, gender, and age; however, a significant difference was found with nationality. The difference regarding nationality means that there could be a language barrier and marginalization in the system among the nurses or even among the patients. Studies found that, because of the immense diversity in culture, language barriers, and lack of support, nurses had difficulties understanding and remembering cultural preferences ([Hart & Mareno, 2014](#); [Mcfarland & Wehbe-Alamah, 2014](#)). Saudi Arabia's healthcare system relies heavily on immigrant nurses hired from over 52 countries ([Alyami & Watson, 2014](#)). Differences in faith, culture, social values, and language can build barriers between patients and immigrant nurses ([Al-Mahmoud et al., 2012](#)).

The nurses were consistently concerned with meeting language barriers ([Hadziabdic et al., 2015](#)). Communicating health information is additionally challenging in a

setting where the patients and healthcare professionals speak different languages, and English is the language of the healthcare practice. The findings on these dimensions provide awareness to nursing administration to create policies and procedures. Nurses who speak the language can, for instance, be partnered with nurses who are still learning it. This serves to provide consistent direction by eliminating misunderstandings and establishing a well-meaning working environment ([Atanga & Ayong, 2017](#)). It becomes easier to solve nursing care problems when protocols and guidelines are clearly followed by nurses and patients. Holistic nursing care should consider the principles and beliefs that affect people, families, and groups. To provide reliable, fulfilling, and culturally appropriate treatment, it must be focused on the patients' cultural way of life ([Zamanzadeh et al., 2015](#)). By understanding these differences, nurses will resist stereotyping and recognize that not all patients can react to the values or traditions of nursing care ([Mcfarland & Wehbe-Alamah, 2014](#)).

On the spiritual dimension, the length of experience and age were not significant. However, a significant difference was found in the nationality and gender of the participants. This difference was there because most of the nurses delivering health care are immigrant nurses and Christians, and they are assumed to adjust, especially regarding their religion. Saudi Arabia is known to be an absolute Muslim country where Christian nurses might have difficulty expressing their faith. [Almutairi et al. \(2015\)](#) pointed out that, while Saudi Arabia gives freedom to non-Muslims to practice their religion, it has to be in private. The significant difference in gender implies that the nurses' gender could create a deficiency in capability and confidence in them to provide spiritual care. This result may be attributed to the extreme working conditions and obligations of mothers and housewives, as determined by their culture ([Alshehry, 2018](#)). As [Almutairi et al. \(2015\)](#) maintained, spiritual care could be associated with personal features such as gender, which can lead to disparities in the nurses' capability to deliver spiritual care. These results could contribute to nursing education, provided that the development of an effective cultural and language training program is added before immigrant nurses leave their home country. Moreover, the introduction of guidance programs to help immigrant nurses benefit tremendously from the provision of spiritual care ([Alshammari et al., 2019](#)). Similarly, education curriculums can deal with gender disparities and inequality to provide nurses with practical learning opportunities ([Jradi et al., 2013](#)). Decreased levels of spiritual suffering are seen when spiritual demands are met ([Kitchener, 2019](#)). Moreover, there are reports that sufficiently attending to spiritual needs can enable healing ([Willemse et al., 2018](#)).

Overall, the implications of this study give a better perspective for nurses about the value of more comprehensive and structured treatment being implemented and provided. Indeed, the findings of this

study provide operating room nurses the need to continue offering systematic nursing, not just in Saudi Arabia but also in the international context, taking into account the beliefs, cultures, and viewpoints of patients. The findings of this study highlighted the causal factors affecting holistic treatment and prompting other nurses and nursing stakeholders globally to look for ways to improve holistic nursing further. This helps nurses to understand better the use of holistic care in improving the condition of their patients. Of note, regardless of the nurses' demographics, this research is a compelling reminder that holistic nursing improves the overall outcomes of care.

The authors acknowledged the limitations of this study. Some of the limitations include; the use of convenience sampling, which lacks clear generalizability, the non-inclusion of the construct validity, which may enhance to strengthen the instrument's validity, and the non-translation of the instrument to the Arabic version. These limitations can be addressed in future studies such that investigators will consider using probability sampling (e.g., simple random sampling) and re-validate the instrument within the investigator's locality with construct validity when using the developed tool. Translation of the instrument to include non-English speakers is highly recommended to future investigators conducting the same study focus.

## Conclusion

Nationality plays a role in the physiological, socio-cultural, psychological, and spiritual dimensions, while gender is a factor of the spiritual aspect. In addressing these variables in the continuing nursing education, it is assumed that nurses deliver more holistic and comprehensive care. Regardless of nationality or gender, nurses must be knowledgeable regarding the significance of adopting holistic care to improve the quality of their care to their patients.

### Declaration of Conflicting Interest

The authors declare no conflict of interest.

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### Author Contribution

HMA and VEB conceptualized and drafted the research, BSA and RDD performed data collection, data management, and analysis. PP focused in developing the questionnaire and validation. All of the authors read and approved the final draft.

### Data Availability Statement

The data that support the findings of this study are available upon request to the corresponding authors.

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# Factors influencing readmission among Thais with myocardial infarction

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## Abstract

**Background:** Readmission among patients with myocardial infarction is costly, and it has become a marker of quality of care. Therefore, factors related to readmission warrant examination.

**Objective:** This study aimed at examining factors influencing readmission in Thai with myocardial infarction.

**Methods:** This was a cross-sectional study with 200 participants randomly selected from five regional hospitals in Thailand. All research tools used indicated acceptable validity and reliability. Linear Structural Relationship version 8.72 was used for the data analysis.

**Results:** The findings showed that the hypothesized model with social support, depression, symptom severity, comorbidity, and quality of life could explain 4% ( $R^2 = 0.04$ ) of the variance in readmission ( $\chi^2 = 1.39$ ,  $df = 2$ ,  $p < 0.50$ ,  $\chi^2/df = 0.69$ ,  $GIF = 1.00$ ,  $RMSEA = 0.00$ ,  $SRMR = 0.01$ , and  $AGFI = 0.98$ ). Symptom severity was the most influential factor that had a positive and direct effect on the readmission rate (0.06,  $p < 0.05$ ).

**Conclusion:** These findings serve as an input to decrease readmission in patients with myocardial infarction by reducing the symptom severity and comorbidity and promoting a better quality of life.

## Keywords

myocardial infarction; readmission; Thailand; nursing

Readmission among myocardial infarction (MI) patients (MIPs) has become the principal marker of the quality of care (Dunlay et al., 2012; Kwok et al., 2018). Despite improvements in acute care and survival after hospitalization, readmission remains an important contributor to health care costs (O'Brien et al., 2017; Southern et al., 2014). A previous study found that 62% of MIPs are readmitted within one year (Southern et al., 2014). There are several reasons for readmission, such as poor adherence to advice for health (i.e., adhere to medicine, nutrition, and restricted fluids), emotional or mental factors (i.e., mood status, substance abuse, and impairs the cognitive function), environment, insufficient discharge program, and other health problems (Annema et al., 2009; Jenghua & Jedsadayanmata, 2011; Ryan et al., 2014). Thus, readmission remains a significant health problem, a frequent, high cost of care, and a life-threatening event, as well as it is related to the quality of care (Hasan et al., 2010; Jencks et al., 2009).

In Thailand, MI is a leading cause of death, from 2014 to 2018 (Charupronprasit et al., 2017). However, there is very little information on readmission among MIPs. Although a previous study found that the rate of readmission of MIPs was 14.07%, caused by chest pain and chronic kidney failure (Jenghua & Jedsadayanmata, 2011), it is impossible to draw a reliable conclusion from this finding. In addition, an abundance of research documents on readmission have been conducted in the United States (USA), where factors related to readmission have been reported, but may not entirely apply to Thailand (Coffey et al., 2012; Hasan et al., 2010; Polsook et al., 2013, 2016).

Numerous interventions have successfully reduced readmission rates among MIPs, such as discharge programs, advising and counseling programs, and medication regimen programs (Annema et al., 2009; Jenghua & Jedsadayanmata, 2011; Ryan et al., 2014). However, the percentage of readmission in MIPs is

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continue to rise. In Thailand, little investigation has been carried out on the factors related to readmission among MIPs. Since characteristics of Thai's culture are incompatible with the USA, it is logical to suspect that findings of research in the USA may partially differ from the situation in Thailand because of the different cultural characteristics, such as income and education, which were reported to be connected to readmission (Annema et al., 2009; Coffey et al., 2012; Hasan et al., 2010; Jencks et al., 2009).

As the biggest health care professionals' group, nurses contribute in a positive and negative way to the problem of health care quality. Nurses have an intimate understanding of patient needs and important roles in caring for patients and family, and uniquely position them to positively affect their hospital experiences and subsequent outcomes (Duffy, 2009, p. 6). The quality of care is a model designed to support the understanding of the connection between quality health care and caring (Duffy, 2009, p. 35). This model is composed of three elements of a quality caring model (Duffy, 2009). The structure is the first element, which consists of the resources of the institution, provider credentials, and characteristics of the patient. This paper focused on the characteristic of the patients because we were required to emphasize the independent variables associated with the patients. The process is the second element, which refers to the actions done for the patient, including both the practical and relational aspects of care. The outcomes are the third element, which refers to the consequences of the health care process (Duffy, 2009; Polsook & Aungsuroch, 2020). This study focuses on the characters of MIPs, because we aimed to maneuver the variables associated with the patients beforehand, emerging a procedure to enhance the result of care (Polsook & Aungsuroch, 2020).

The pursuing variables linked to readmission in MIPs have been recorded. These factors are social support, depression, comorbidities, symptom severity, and quality of life (QOL) (Annema et al., 2009; Polsook & Aungsuroch, 2020). The connection amongst variables can be illustrated as follow: (1) social support is a significant predictor of QOL and high level of social support relevant to the high quality of life resulting in decreased readmission in MI (Bennett et al., 2001; Volz et al., 2011); (2) depression is negatively associated to QOL and linked to readmission (Faller et al., 2010; Heo et al., 2009); (3) symptom severity has a strong association with QOL, with higher severity of symptoms related low QOL and frequency readmission (Faller et al., 2010; Giamouzis et al., 2011); (4) comorbidity is a significant predictor of readmission and comorbidity is a disease and overload connected with rising readmission (Benbassat & Taragin, 2000; Hasan et al., 2010; Kansagara et al., 2011); and (5) patients who have experiences with physical and emotional symptoms result in reduced QOL, which is connected to the higher incidence of readmission (O'loughlin et al., 2010; Sethares & Elliott, 2004). Given the linkage of the variables on readmission,

this study aimed to test a model to explain how those potential factors influenced readmission in Thai MIPs.

## Methods

### Study Design

This research employed a descriptive cross-sectional design.

### Sample and Setting

The population in this research was Thais with myocardial infarction. A total of 200 MIPs were recruited from excellence center hospitals across Thailand. The sample size was derived from Hair et al. (2010), which at least 200 samples recommended for a complex model with more constructs. Additionally, the adequate sample size for path analysis is ten times for each parameter. This research had 13 parameters; thus, a sample size of 130-260 was the requirement to match the complexity to the path model.

A modified multi-stage sampling method was used to select the samples from hospitals based in the Northern, Southern, Central, and Northeastern regions of Thailand. The inclusion criteria were: (i) recently readmitted in an inpatient cardiology department in one of five selected hospitals in Thailand, (ii) aged  $\geq 20$  years, and (iii) having no cognitive impairment or disease complications based on their current medical record. If the participants had any exacerbations of the disease, such as shock, acute pulmonary edema, acute shortness of breath, and acute chest pain, during collecting data were excluded.

### Instruments

The questionnaire on sociodemographic characteristics was designed to gather sociodemographic data, including gender, age, marital status, type of health care coverage, readmission, comorbidity, and symptom severity (Polsook & Aungsuroch, 2020). Readmission refers to the number of MIPs repeatedly hospitalized within 12 months of discharge from the index hospitalization collected from their medical records (Polsook & Aungsuroch, 2020). Comorbidity refers to the presence of additional conditions co-occurring with MIPs and was collected from the medical record (Polsook & Aungsuroch, 2020).

The severity of symptoms was used in the Canadian Cardiac Society (CCS) classification to categorize angina pectoris, including Class I – angina pectoris during intensive or long-term physical activity, Class II – angina pectoris with moderate exertion, Class III – undergoing angina with mild exertion, and Class IV – undergoing angina at rest (Polsook & Aungsuroch, 2020; Sangareddi et al., 2004).

Multidimensional Scale of Perceived Social Support (MESSI) (Zimet et al., 1988) was used to measure social support. This scale was translated into a Thai version by Wongpakaran and Wongpakaran (2012). The scale consists of 12 items to evaluate perceived social support from friends, family, and significant others. A seven-point (1–7) Likert scale was used, ranging from 1 to 7, with a total

score for 12 items of 12–84. A higher rating is an indication of a higher level of social support. Cronbach's alpha coefficient was 0.89 (Phromsorn et al., 2019; Polsook & Aungsuroch, 2020).

Cardiac Depression Scale (CDS) was used to measure depression. The scale consists of 26 items to measure sleep, uncertainty, mood, hopelessness, inactivity, anhedonia, and cognition (Hare & Davis, 1996; Oldridge, 1997). This scale was translated into a Thai version by Polsook and Aungsuroch (2019). The CDS uses a 7-point scale from 1 to 7, with a score excess of 100 is delineated as strong depression (Kiroopoulos et al., 2012). Cronbach's alpha coefficient of the Thai version was 0.82 (Polsook & Aungsuroch, 2019).

Quality of life Index-Cardiac version IV Thai version (QLI-cardiac IV) was translated into a Thai version by Saengsiri and Hacker (2015). The QLI-cardiac IV was developed to assess the QOL regarding the life's satisfaction of cardiovascular patients. This instrument includes about 70 items to measure the satisfaction of patients with several aspects of life (35 items) and assessed the importance of those same aspects (35 items). The scale used on a 5-point scale ranging from 0 to 5 and a final rating scale ranging from 0 to 30. A rating between 21 and 30 is described as a high QOL. Cronbach's alpha coefficient of the Thai version was 0.91 (Polsook & Aungsuroch, 2019; Saengsiri & Hacker, 2015).

### Data Collection

Data collection was carried out after the approval of each hospital's Institutional Review Board (IRB) was obtained. The researcher illuminated and clarified the study objectives, data collection procedures, expected outcomes, and the study's benefits to the physicians and nurses of each cardiology inpatient department in the chosen hospitals. One nurse with experience in taking care of cardiovascular patients was assigned as a research assistant. The researcher trained and evaluated the research assistants in regards to the questionnaire administration, informed consent procedures, and the participant information sheet. Research assistants were also trained to interview the participants by reading the questionnaires word by word.

Participants who met the inclusion criteria were then invited to participate in this study. They were informed of the study objective, data collection process, and their rights to decide to participate or refuse to participate in the study. Those participants who still agreed to participate in this study were asked to sign an informed consent form. The researcher explained that there was no harm to the participants in this study and that it would take 30–45 min to complete all the questionnaires. During data collection, participants were able to refuse or leave the study at any time without any consequence (Polsook & Aungsuroch, 2020).

### Data Analysis

The Statistical Package for Social Science (SPSS) program version 22 was used for data analysis, particularly in descriptive statistics. Linear Structural Relationship (LISREL) version 8.72 was used for path analysis, accepting significance at the  $p < 0.05$  level. The statistical criteria by Hair et al. (2010) were used to evaluate the overall model-fit-index and the hypothesis according to the four criteria outlined as follows. Firstly, the  $\chi^2$  test was used to evaluate the appropriateness of the hypothesized model. The model was considered a good fit if the  $\chi^2$  value was not significant ( $p > 0.05$ ) and if  $\chi^2/\text{df}$  was less than 2. Secondly, the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) were used to measure the overall model fit. RMSEA value of less than 0.05 was considered a good fit model, while a value between 0.05–0.08 was considered an adequate fit model. In addition, the SRMR value should be less than 0.05 for a good fit model. Thirdly, a goodness-of-fit ( $GFI$ )  $\geq 0.95$  and adjusted  $GFI$  ( $AGFI$ )  $\geq 0.90$ , were also used for examining the goodness-of-fit statistics. Finally, if the hypothesized model fit the data, the path coefficients and  $R^2$  were then estimated, and the effects of the independent variables on the dependent variable were determined. The goodness-fit-indices were used to determine whether the model adequately fitted the data (Hair et al., 2010).

### Ethical Consideration

This study was approved by the IRBs of the excellence center care hospitals from all regions of Thailand. Those IRBs included the IRB of Hatyai hospital (Approval Number 85), the IRB on Human Right Related to Research Involving Human Subjects of the Faculty of Medicine Ramathibodi Hospital Mahidol University (Approval Number 2558/716), IRB of the Faculty of Medicine Chiang Mai University (Approval Number 2558-03518), IRB of the Faculty of Medicine Chulalongkorn University (Approval Number 074/59), and IRB of Khon Kaen University (Approval Number 00001189) (Polsook & Aungsuroch, 2020).

## Results

### Characteristics of Participants

Most of the participants were aged  $\geq 61$  years (62.5%), predominantly male (63%), and married (78.5%). Just over half of the participants (54.5%) utilized the Universal Coverage Scheme (the 30-Baht Scheme) of Thailand. The highest proportion of participants with an education level was primary school (52.0 %), followed by high school (24.5%), and higher education (19.5%). According to the classification of symptom severity by the CCSV (Sangareddi et al., 2004), 28.5% of the participants were in class I, 33% in class II, 19.5% in class III, and 19% in class IV. The majority of participants had one (40.5%) or no (24.5%) comorbidity. In addition, most of them (88%) were readmitted only 1 or 2 times within 12 months after the initial hospital discharge is shown in Table 1. Details about each variable's characteristics are presented in Table 2.

**Table 1** Demographic and clinical characteristics of the myocardial infarction patients (*N*=200)

Characteristics	Number (n)	Percent (%)
<b>Age</b>		
20–40	10	5
41–60	65	32.5
≥ 61	125	62.5
<b>Gender</b>		
Male	126	63
Female	74	37
<b>Marital status</b>		
Single	10	5
Married	157	78.5
Widowed	28	14
Divorced	5	2.5
<b>Education level</b>		
Non-education	8	4
Primary school	104	52
High school	49	24.5
Higher education	39	19.5
<b>Type of health care coverage</b>		
Universal Coverage Scheme (30-Baht Scheme)	109	54.5
Social security	12	6
Pay by themselves	5	2.5
Government coverage	74	37
<b>Canadian Cardiovascular Society Classification</b>		
Class 1	57	28.5
Class 2	66	33
Class 3	39	19.5
Class 4	38	19
<b>Comorbidities</b>		
No comorbidity	49	24.5
One comorbidity	81	40.5
Two comorbidities	37	18.5
Three comorbidities	33	16.5
<b>Readmission</b> (within 12 months of discharge from hospital)		
1–2 times	176	88
3–4 times	20	10
5–6 times	2	1
7–8 times	0	0
9–10 times	2	1

**Table 2** Characteristics of study variables

Variable	Mean	Standard deviation	Interpretation
Readmission	1.16	0.53	1–2 times
Social support	64.03	13.66	High
Depression	86.34	26.27	Not depressed
Quality of life	24.66	2.94	High
Comorbidity	2.27	1.01	One comorbidity
Symptom severity	2.30	1.08	Class II

### Relationships Between Variables

The relationships among the social support, depression, symptom severity, comorbidity, QOL, and readmission were examined using the Bivariate Pearson's correlations (**Table 3**), with the extent of the relationships defined by the following criteria:  $r > 0.50$  = strong / high relationship,  $0.30 \leq r \leq 0.50$  = moderate relationship, and  $r < 0.30$  = weak/low relationship (Burns & Grove, 2005). The social support had a low negative correlation with readmission ( $r = -0.06$ ,  $p < 0.05$ ), depression and symptom severity had a low positive correlation with readmission ( $r = 0.11$ , and  $r = 0.10$ ,  $p < 0.05$ ), and no correlation was found between readmission and comorbidity and QOL ( $r = 0.00$  and  $r = 0.00$ ,  $p < 0.05$ ).

Depression, symptom severity, and comorbidity all had a low negative relationship with the social support ( $r = -0.16$ ,  $-0.04$ , and  $-0.05$ , respectively;  $p < 0.05$ ). The QOL had a low positive relationship with social support ( $r = 0.25$ ,  $p < 0.05$ ) and a moderate negative correlation with depression ( $r = -0.39$ ,  $p < 0.05$ ), a low negative correlation with comorbidity ( $r = -0.15$ ,  $p < 0.05$ ) and symptom severity ( $r = -0.18$ ,  $p < 0.05$ ). The symptom severity had moderate positive correlation with depression ( $r = 0.36$ ,  $p < 0.05$ ), while comorbidity had a weak positive correlation with depression ( $r = 0.13$ ,  $p < 0.05$ ) and symptom severity ( $r = 0.20$ ,  $p < 0.05$ ).



**Table 3** Pearson's relationships among readmission, social support, depression, symptom severity, comorbidity, and the QOL

	Readmission	Social support	Depression	Symptom severity	Comorbidity	QOL
Readmission	1.000					
Social support	-0.06	1.000				
Depression	0.11	-0.16*	1.000			
Symptom severity	0.10	-0.04	0.36**	1.000		
Comorbidity	0.00	-0.05	0.13	0.20**	1.000	
QOL	0.00	0.25**	-0.39**	-0.18*	-0.15*	1.000

\*  $p < 0.05$  | \*\*  $p < 0.01$  | QOL=Quality of life

### Model Testing

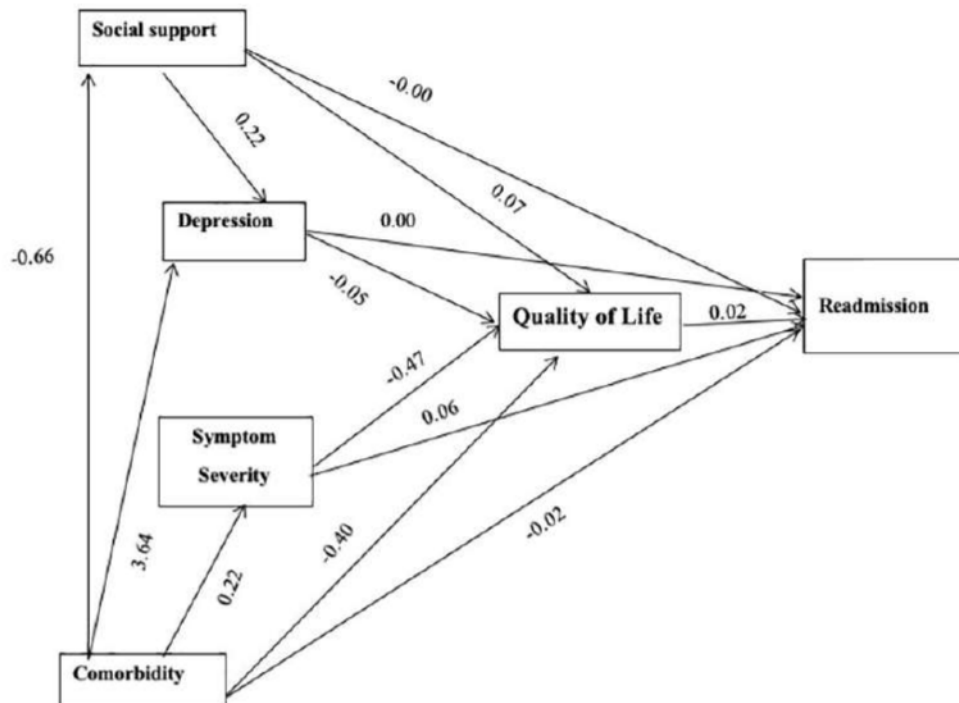
The results from the hypothetical pattern matched the empirical evidence and could explain 4% ( $R^2 = 0.04$ ) of the variance in readmission by social support, depression, symptom severity, comorbidity and QOL ( $\chi^2 = 1.39$ ,  $df = 2$ ,  $p = 0.50$ ,  $\chi^2/df = 0.69$ ,  $GFI = 1.00$ ,  $RMSEA = 0.00$ ,  $SRMR$

$= 0.01$ , and  $AGFI = 0.98$ ). Twenty-eight percent ( $R^2 = 0.28$ ) of the variance in the QOL was explained by the social support, comorbidity, symptom severity, and depression; 3% ( $R^2 = 0.03$ ) of the variance in depression was explained by social support, comorbidity, and symptom severity; and 4% ( $R^2 = 0.04$ ) of the variance in symptom severity was explained by comorbidity (Table 4).

**Table 4** The proportion of the variance in the dependent variable that is predictable from the independent variables

Variables	Influencing variables	$R^2$
Readmission	Social support Comorbidity Symptom severity Depression Quality of life	0.04
Quality of life	Social support Comorbidity Symptom severity Depression	0.28
Depression	Social support Comorbidity Symptom severity	0.03
Symptom severity	Comorbidity	0.04

$R^2$  = The coefficient of determination



**Figure 1** Final model of readmission among myocardial infarction

The results of the final model testing as shown in **Figure 1** are summarized in accordance with the hypothesized model as follows. The QOL had a direct positive impact (0.02) on readmission, while social support and depression did not directly affect readmission (0.00, 0.00). Besides, symptom severity had a direct positive impact (0.06) on readmission, contrasting with comorbidity that had a direct negative impact (-0.02) on readmission. Social support had a positive direct effect (0.06) on QOL and a negative effect (-0.01) through QOL on readmission. Comorbidity had a direct negative impact (-0.40) on QOL and a negative effect (-0.27) through QOL on readmission. Symptom severity had a negative effect (-0.47) on QOL and had a negative effect (-0.01) through QOL on readmission. Depression had a negative effect (-0.05) on QOL, while social support had a positive effect (0.22) on depression. Besides, comorbidity had a positive effect (3.64) on depression. It also had a positive effect (0.22) on symptom severity and a negative effect (-0.66) on social support.

## Discussion

This study revealed that social support did not affect the readmission of MIPs. Most of the participants were elderly, and their social support was at a moderate level. Because Thailand had an extended family, most participants live with their families, where there is a possibility that family members may have been involved in the patient's care and support (Polsook et al., 2013, 2016). This finding was supported by Leifheit-Limson et al. (2012), who reported that a high social support level was associated with lower hospital readmission of MIPs. Similarly, Mcneely et al. (2016) found that high social support in MIPs who received the percutaneous coronary intervention was associated with a lower rehospitalization rate.

Additionally, we found that social support had a direct positive impact on depression, where most of the MIPs in this study had a high social support level living with their extended family and were not depressed. Leifheit-Limson et al. (2012) found that a low social support level was related to more depressive symptoms among MIPs, and a high social support level resulted in a low level of depression. It is supported by Compare et al. (2013) and Liu et al. (2017) reported that an elevated level of social support lowered depressive symptoms among heart patients.

This study also found that social support had a positive impact on the QOL and a negative indirect impact on readmission through the QOL. Since most participants had an elevated QOL and social support level, they were only readmitted one or two times within the 12 months after initial hospital discharge. This result supported previous studies in that social support had a positive impact on the QOL among MIPs (Kang et al., 2018). In addition, the QOL, an outcome measurement after acute MI, was lower in the early recovery period when there was an inadequate social support level (Leifheit-Limson et al., 2012). Likewise, a high

social support level in MIPs was linked to a high QOL and reduced readmission (Martínez-García et al., 2018).

In this study, depression was not an effect on readmission, a negative indirect effect on readmission through the QOL, and a negative direct impact on the QOL. This reflected that most of the MIPs were not depressive, having a high QOL and low readmission rate of only one–two times within the 12 months after initial hospital discharge. In agreement, a high level of depression was reported to be related to hospital readmission and a decreased QOL (Kang et al., 2018), while depression was also associated with readmission in acute coronary syndrome (Edmondson et al., 2014).

The symptom severity was found to have a negative direct impact on the QOL and a positive direct effect on readmission. As already pointed out, most of the MIPs in this study had a high QOL and symptom severity of only class I (28.5 %) or class II (33%) of the CCSC, which their low symptom severity resulted in a high QOL and reduced readmission rate. This result supported previous studies that low symptom severity was linked to delayed readmission (Kwok et al., 2018) and an increased QOL (Kang et al., 2018) among acute MIPs. Likewise, the symptom severity, such as physical symptoms and limitations in daily activities due to heart failure, affected the QOL (Heo et al., 2009). Low symptom severity was linked to a higher QOL (Adebayo et al., 2017).

In our study, nearly half of the participants had one comorbidity. About one-third had no comorbidity, no depression, a high QOL, and a low readmission rate (one or two times within 12 months after hospital discharge). Thus, the participants' low comorbidity was related to their low level of depression, which resulted in a high QOL and a low readmission rate. In agreement, MIPs who received a percutaneous coronary intervention had a high rate of readmission if they had comorbidity (Kwok et al., 2018; Southern et al., 2014), while the presence of more comorbidities had a higher risk of hospital readmission (Andrés et al., 2012; Kwok et al., 2017), as well as high symptom severity and readmission risk (Desta et al., 2017; Fanari et al., 2017; Mcneely et al., 2016). In addition, MIPs who had comorbidity were associated with depression and linked to readmission (Mcgowan et al., 2004).

The results also revealed that lower comorbidity led to lower symptom severity and high QOL. These results are also in line with a previous study (Bahall & Khan, 2018), while a low symptom severity, such as shortness of breath and chest pain, related to a high QOL in heart failure patients (Lawson et al., 2018; Nuraeni et al., 2019). Besides, QOL has been shown to directly impact the readmission rate, which a high QOL was associated with a low rate of readmission. Previous studies found that a poor QOL led to a higher rehospitalization rate and was associated with readmission (Adebayo et al., 2017; Tully et al., 2016).

This study has several limitations. The self-reporting used in this study might cause overvalued or undervalued data, which could be a limitation. The instruments to

measure the potential variables were only used once in the context of Thailand. Thus, assessing validity and reliability within Thailand's context is required to confirm the instruments' reliability. Based on the findings of this study, a longitudinal study should be done to measure and adjust these variables with readmission in MIPs to provide a further causal explanation of readmission in MIPs and its predictors. However, our findings can contribute to knowledge development for strengthening nursing science for caring MIPs. The results provide knowledge that offers directions for the development of interventions to decrease readmission in MIPs. It should promote social support to enhance the QOL and develop strategies to control the severity of symptoms to mitigate readmission in MIPs.

## Conclusion

Based on these findings, the severity of the symptoms and QOL of MIPs were correlated to readmission. Nurses should develop strategies to control or decrease symptom severity and develop an intervention protocol to reduce readmission in MIPs. This should integrate the promotion of social support to enhance the QOL to decrease readmission and increase care quality for MIPs.

## Declaration of Conflicting Interest

There are no potential conflicts of interest to declare.

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## Data Availability Statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Author Contribution

All authors contributed to the final manuscript. R.P. designed the study, collected data, analyzed the data, wrote and revised the manuscript. Y.A. designed the study, wrote and revised the manuscript.

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# Relationship between hand hygiene behavior and *Staphylococcus aureus* colonization on cell phones of nurses in the intensive care unit

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## Abstract

**Background:** Healthcare-Associated Infections (HAIs) are infections that often occur in hospitals with *Staphylococcus aureus* as the primary cause. *Staphylococcus aureus* is usually found on nurses' hands and easily transferred by contact. Cell phones can be a convenient medium for transmitting bacteria. Accordingly, hand washing is one of the effective ways to prevent the transmission of *Staphylococcus aureus*.

**Objective:** This study aimed to determine the relationship between hand hygiene behavior and the colonization of *Staphylococcus aureus* on cell phones of nurses in the intensive care unit of the academic hospital.

**Methods:** This was an observational study with a cross-sectional design conducted from December 2019 to January 2020. The observations of hand hygiene behaviors were performed on 37 nurses selected using total sampling. Colonization of bacteria on each nurses' cell phone was calculated by swabbing the cell phones' surface. Colony counting was done using the total plate count method. Spearman Rank test and Mann Whitney test were used for data analysis.

**Results:** The nurses' hand hygiene behavior was 46.06%. *Staphylococcus aureus* colonization was found on 18.2% of the nurses' cell phones. However, there was no significant relationship between the nurses' hand hygiene behavior and the colonization of *Staphylococcus aureus* on their cell phones.

**Conclusion:** The hand hygiene behavior of nurses was still low, and there was evidence of *Staphylococcus aureus* colonization on their cell phones. As there was no relationship between the nurses' hand hygiene behavior with the colonization of *Staphylococcus aureus* on the cell phones, further research is needed to determine if there is an increase or decrease in colonization before and after regular observations.

## Keywords

cell phone; healthcare-associated infections; hand hygiene; *Staphylococcus aureus*; nurses

Healthcare-Associated Infections (HAIs), or formerly known as nosocomial infections, are infections acquired by patients receiving treatment for a medical condition or surgery and considered adverse events that often occur during treatment (World Health Organization, 2011). HAIs are also a significant cause of morbidity and mortality (Agency for Healthcare Research and Quality, 2019). The occurrence of HAIs is more common in the middle and low-

income countries, 5.7% and 19.1%, respectively, or three times higher than in high-income countries (Khan et al., 2017). HAIs in Southeast Asia accounted for approximately 75% of the incidence (World Health Organization, 2011).

One of the most common causes of HAIs is *Staphylococcus aureus*, a gram-positive bacteria that often causes various infections; MRSA is one (Bröker et al.,

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2016). World Health Organization (2011) reported that 5-10% of hospitals' infections are caused by *Staphylococcus aureus*, and the incidence is increasing every year. This increase has occurred in almost all regions of the world. Asia is the region with the highest incidence of infection across the globe. Indonesia is one of the countries with an increased incidence of infection with *Staphylococcus aureus* in Southeast Asia, approximately 28% (Chen & Huang, 2014).

The high incidence of this infection can be a mode of transmission, from patients to patients, patients to health workers, patients to medical equipment, health workers to visitors, and from health workers to other health workers and the environment (Khan et al., 2017; Price et al., 2017). Hand contact is the main transmission in its spreading mode (Levinson, 2010; Nazliansyah et al., 2016). Health care workers' hands play an important role in the transmission of HAIs, including nurses.

Cell phone is considered a convenient transmission medium for HAIs (Kanayama et al., 2017; Pillet et al., 2016), as it is rarely cleaned and frequently touched during or after examining patients without washing (Pal et al., 2015). Therefore, hand hygiene is recommended to be the primary measure necessary to reduce HAIs. Hand hygiene is also a key indicator in the infection prevention and control assessment for medical personnel (World Health Organization, 2018), especially for nurses who most often meet patients and take action on patients 24 hours of admission to a hospital. Given the explanation above, the purpose of this study was to determine the relationship between nurses' hand hygiene behavior with the colonization of *Staphylococcus aureus* on their cell phones in the intensive care unit.

## Methods

### Study Design

This study employed an observational design with a cross-sectional approach from December 2019 to January 2020.

### Sample

The study population included nurses who worked at the intensive care unit of UGM Academic Hospital, Yogyakarta, Indonesia. The sample size was determined by total sampling. The inclusion criteria were a nurse who had a cell phone and always brought the cell phone to the intensive care unit. The exclusion criteria were a nurse who took extended leave, maternity leave or attended training or activities outside the hospital during the study. Total respondents were 38 nurses, but one respondent dropped out because of an injury in his right hand, so he could not perform proper hand hygiene.

### Instrument

Nurses' hand hygiene behaviors were measured using the checklist sheets in the form of compliance behavior observations of hand hygiene following 'My five moments' approach adopted from Pittet et al. (2009), with the

measurement results in the form of a percentage comparison between actions and opportunities. The five moments observed were 1) before touching a patient, 2) before clean/ aseptic procedure, 3) after body fluid exposure risk, 4) after touching a patient, and 5) after touching patient surroundings.

Colonization of *Staphylococcus aureus* was observed by implanting cell phone surface swabs on Nutrient Agar and *Staphylococcus* Agar media. After incubation at 37°C for 18-24 hours, the number of colonies that grew was counted by the total plate count method. Identification of *Staphylococcus aureus* was conducted according to the Standard Operating Procedure in the Microbiology Laboratory of the Faculty of Medicine, Public Health and Nursing (FKKMK UGM) (Granato et al., 2019).

### Data Collection

Observations were made by the researcher and assisted by a research assistant, namely a master nursing student who has gained knowledge and practice related to procedures in bacterial identification. An interobserver test was done using the Intraclass Correlation Coefficient (ICC) with a test result of 0.988, which indicated the acceptable reliability of the two observers. Observations were made on nurses who were implementing nursing care during their shift. In making observations, the researcher did not tell the respondent who was observed in one shift to avoid bias. Each respondent was observed three times with a random observation time (a full hour for each observation).

### Data Analysis

Univariate analysis was conducted to determine the characteristics of the respondents using the average distribution and frequency, including name, age, gender, last education, length of service, occupation, frequency of cleaning cell phones, cleaning materials, and length of time having a cell phone. Bivariate analysis was conducted to determine the relationship between hand hygiene behavior and bacterial colonization on nurses' cell phones. As data were not normally distributed ( $p < 0.05$ ), the Spearman rank test was used to examine the relationship between hand hygiene behavior and the amount of colonization of bacteria. To identify the relationship between hand hygiene behavior and the presence of bacterial colonization, the Mann Whitney test was used. Statistical analysis was performed using SPSS version 21 software (IBM Corp., Chicago).

### Ethical Consideration

This research has received ethical approval from the Medical and Health Research Ethics Committee of FKKMK UGM on 25 October 2019 with the number KE/FK/1267/EC/2019. After the researcher clearly explained the study's objectives, the respondents voluntarily signed the informed consent form to participate in the study. The respondents had the right to refuse to participate without penalty. We ensured that participants were not affected by any consequences in their work.

## Results

### Characteristics of Respondents

The majority of respondents were women (78.4%), and their average age was 29.6 years old, with the education level of registered nurses (64.9%) and the average length of work of 4 years. All of the respondents indicated they had never cleaned their mobile phones with agents such as alcohol (97.3%). Most respondents had their cell phones for over 12 months (81.1%) (**Table 1**).

**Table 1** Distribution of respondents' characteristics ( $n = 37$ )

Characteristics	Average (Year)	f	%
Age	29.6		
Gender			
Men		8	21.6
Women		29	78.4
Education			
Associate Degree		13	35.1
B.N. + RN		24	64.9
Length of work	4.0		
Never cleaned cell phones			
Yes		37	100.0

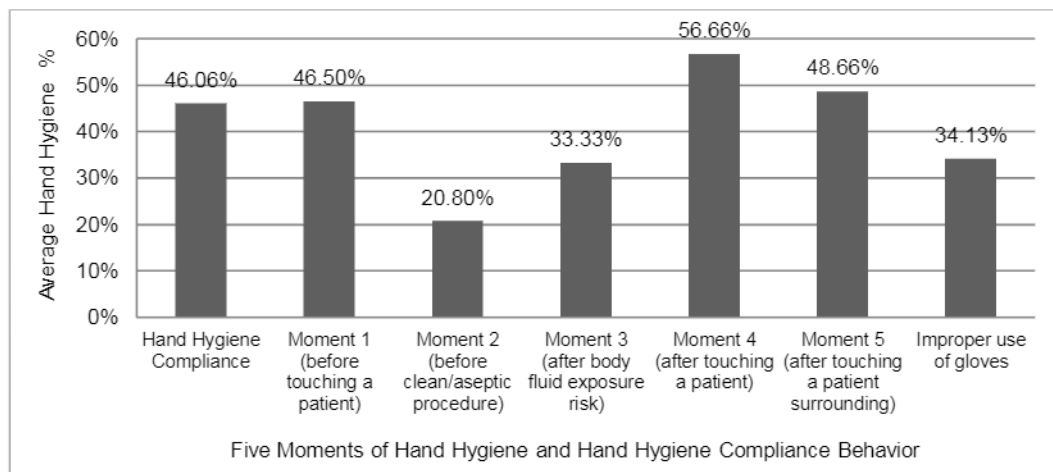
**Table 1** (Cont.)

Material	Alcohol	36	97.3
	Non-alcohol	1	2.7
Length of having a cell phone	0-3 months	3	8.1
	4-6 months	2	5.4
	7-12 months	2	5.4
	>12 months	30	81.1

### Hand Hygiene and Bacterial Colonization

The highest average of nurses' hand hygiene behavior occurred at the moment 4 (after contact with the patient), 56.66%; while the lowest average occurred at the moment 2 (before action aseptic), 20% to 80%. The average of overall moments of hand hygiene was 46.06%. In this study, the use of gloves was also observed when performing hand hygiene. The result of observation showed 34.13% did not use gloves properly (**Figure 1**).

Gram-positive bacteria colonization was found on 35 respondents' cell phones (94.6%), and 24 (64.9%) of them contained *Staphylococcus* spp. Among all respondents, seven cell phones (18.92%) had *Staphylococcus aureus* colonization (**Table 2**).



**Figure 1** Average hand hygiene for nurses in the intensive care unit in 2020 ( $n = 37$ )

**Table 2** Colonization of bacteria on cell phones ( $n = 37$ )

	Average (CFU/ml)	Max (CFU/ml)	Min (CFU/ml)	f	%
Bacterial colonization					
Gram-positive					
Positive				35	94.6
Negative				2	5.4
Amount	507.84	15.000	0		
Gram-negative					
Positive				21	56.8
Negative				16	43.2
Amount	1927.57	70.000	0		
<i>Staphylococcus</i> spp.					
Positive				24	64.9
Negative				13	35.1
Amount	31.35	250	0		
<i>Staphylococcus aureus</i>					
Positive				7	18.92
Negative				30	81.08
Amount	5.41	100	0		



### The Relationship Between Hand Hygiene Behavior and Bacterial Colonization

Table 3 shows statistically no significant correlation between the nurses' hand hygiene behavior with either the number of bacterial colonization and the presence of bacteria *Staphylococcus* spp. and *Staphylococcus aureus* ( $p > 0.05$ ).

**Table 3** Relationship of nurses' hand hygiene behavior with colonization of *Staphylococcus* spp. and *Staphylococcus aureus* bacteria on cell phones ( $n = 37$ )

	Hand hygiene	<i>p</i>
Bacterial colonization	Presence and absence of bacteria	
	<i>Staphylococcus</i> spp.	0.353
	<i>Staphylococcus aureus</i>	0.450
	Number of bacteria	
	<i>Staphylococcus</i> spp.	0.221
	<i>Staphylococcus aureus</i>	0.473

### Discussion

Figure 1 shows that the average compliance behavior of respondents with hand hygiene was 46.06%, which is considered low. This is in line with [Stahmeyer et al. \(2017\)](#) reported an average hand hygiene adherence of 42.6%, and [Selim and Abaza \(2015\)](#) reported adherence ranging from 37-42%. These reports are of great concern because hand hygiene is the main measure for reducing HAIs and is a critical indicator for assessing infection prevention and control ([World Health Organization, 2018](#)). [Sickbert-Bennett et al. \(2016\)](#) reported that a 10% increase in hand hygiene adherence was associated with a 6% decrease in HAIs.

In this study, it was found that 34.13% of nurses did not use gloves according to the indication. The improper use of gloves may affect low adherence to hand hygiene. Health care workers or nurses often remove their gloves after a single contact. Still, the gloves will only be changed when all courses of action are completed or when they are very dirty and need to be replaced ([Kuzu et al., 2005](#)), or at a change of action at different moments of patient interaction ([Picheansathian & Chotibang, 2015](#)). This is not in accordance with the recommendations established by the WHO guidelines ([World Health Organization, 2009](#)). Hand hygiene behavior affected by the improper use of gloves was reported by [Moghnieh et al. \(2017\)](#). The caregivers did not feel they needed to wash their hands before using gloves because they thought gloves already protect them.

Another aspect that indicates that the use of gloves was not appropriate is at the moment 2 (before aseptic action). The average percentage shows a low number (18.3%), in line with [Picheansathian and Chotibang \(2015\)](#). It is well known that wearing gloves does not prevent cross-infection. Therefore, strengthening education on the appropriate use of gloves indication should always be emphasized.

The length of time doing hand hygiene also affects behavior. According to [Stahmeyer et al. \(2017\)](#), the time spent on hand hygiene is 8.3 minutes in the intensive care unit. If nurses fully comply with the recommendation, then 58.2 minutes will be spent on hand hygiene for each patient during the shift.

The results of the surface swab of the cell phones showed that there were gram-positive bacteria (94.6%) and gram-negative bacteria (56.8%) on the nurses' cell phones. Colonization of *Staphylococcus* spp. was found on the cell phones of 24 respondents (64.9%) with an average number of bacteria, namely 31.35 CFU/m. A total of seven respondents (18.92%) had colonization of *Staphylococcus aureus* on their cell phones. These results are consistent with other studies showing that cell phone use in hospitals poses a risk of transmission of various bacteria, including pathogenic agents resistant to some drugs, such as Methicillin-Resistant *Staphylococcus aureus* (MRSA) ([Curtis et al., 2018](#); [Selim & Abaza, 2015](#)). Cell phones can function as reservoirs for infection in health care settings ([Kanayama et al., 2017](#); [Smibert et al., 2018](#)), with very high levels of contamination ([Pal et al., 2015](#)). The growth rate of pathogens or bacterial contamination is 40-100% on cell phones' surface, and the majority of these bacteria are potentially nosocomial pathogens that cause HAIs ([Curtis et al., 2018](#)). *Staphylococcus aureus* is drought tolerant and can survive and reproduce rapidly in warm environments such as cell phones ([Trivedi et al., 2011](#)).

The bivariate analysis revealed no relationship between hand hygiene behavior and *Staphylococcus aureus* colonization on nurses' cell phones. Poor hand hygiene will affect bacterial colonization growth on cell phones that occurs due to contact with hands. However, it was seen that the good bacteria were present, or there was no growth of bacterial colonization on cell phones, which is equally low with the value of hand hygiene behavior of nurses (46.06%), especially at the moment 2 (20.80%). The compliance value of hand hygiene that must be met is that it must exceed 80% ([Ministry of Health, 2018](#)) to influence the number of bacterial colonization. Still, it has not impacted the presence of bacterial colonization, seeing that the value of bacterial colonization is low.

Other factors can also affect the colonization of bacteria on cell phones, such as the possibility of contamination on cell phones obtained not directly from the patient or nurses' hands but obtained from the care environment where the cell phone is placed. The environment near or far from the patient can be a place for bacterial contamination ([Wille et al., 2018](#)). As for findings in the air, they are considered not a priority because these findings are less than direct contact with the environment or with patients and other health workers ([Kozajda et al., 2019](#)).

In our study, there was no relationship between hand hygiene behavior and colonization. After doing five moments of hand hygiene, certainly, nurses did not directly hold their cell phones. Still, they did other activities

in the care area, either to write on patient medical records or to fill in data on a computer. However, when nurses wanted to use their cell phones, they did not wash their hands. Besides, the hand hygiene moments 4 and 5 (after touching a patient and after touching the patient's environment) showed that the average values of compliance behavior were only 56.66% and 48.66%. The habit of the respondents, who often hold their cell phones before the swab, also affects the number of bacterial colonies. The more frequent use of cell phones will increase the number of bacterial colonization (Hagel et al., 2019).

Another analysis that might result in no relationship between hand hygiene behavior and colonization is related to hand hygiene measures. Besides being done at the right time, hand hygiene measures must also be done with the right steps. Doing hand hygiene with the proper techniques and materials will make hands free of potentially harmful contaminants and lower the risk of contaminating objects or other people (World Health Organization, 2009). Savolainen-Kopra et al. (2012) reported that washing hands with the correct techniques and materials would reduce the risk of contamination by 6.7%. Also, hands that are not dried or are not completely dry when finished washing their hands will increase the amount of bacterial contamination. Transmission of bacteria is more likely to occur from wet hands than dry hands (Huang et al., 2012). Generally, the number of bacteria on the palms is very large, namely  $3.9 \times 10^4$ – $4.6 \times 10^6$  CFU/cm<sup>2</sup> (Siegel et al., 2007), so it is possible to transfer to objects are touched by the hands. After washing hands, some bacteria on the palms remain (Pittet et al., 2009). Widodo et al. (2017) reported remaining around 55.2 CFU ml of bacteria after washing hands.

Hand hygiene measures are more effective if the hands' skin is free from wounds and has natural nails cut short so that no bacteria will remain between the nails, which will reduce transmission (Pittet et al., 2009). The fingers and hands are the parts that most frequently touch the cell phone when in use, so it is essential to perform hand hygiene to prevent transmission of the bacteria. *Staphylococcus* spp. or *Staphylococcus aureus* is normal in humans, especially in the nasal and skin areas (Taylor & Unakal, 2018). One of the factors that can cause the spread of pathogens is hand contact, so hand hygiene is crucial. Therefore, it is advisable to keep washing hands even though they are not in contact with the phone or contact the patient (Lin et al., 2017).

Besides, various other factors, such as the use of cover for mobile phones, can affect the colonization of bacteria on cell phones. The use of plastic as a wrapper for cell phones can reduce bacteria's growth by as much as 4.2 times (Manning et al., 2013). The use of cell phones together with colleagues can also affect contamination from bacteria, and it would be better if cell phones were not carried when conducting actions on patients (Bhoonderowa et al., 2014).

Based on the results of this study, hospital management can improve nurses' understanding related to infection control, namely by socializing about the use of gloves as indicated, hand hygiene, and limited use of cell phones to prevent cross-transmission. This research can be used as a basis for carrying out nursing practice and a reason for routine hand washing before and after using cell phones. The findings of this study also increase understanding about indications of glove use and regular cleaning of cell phones with a cleaning period.

The limitation of this study is that there was no examination of bacteria before the observation was carried out. So, it could not show whether there was a decrease or increase in bacterial colonization on cell phones due to hand hygiene. The colonization data were also taken immediately after three random observations, so the relationship of hand hygiene behavior might not be described accurately.

## Conclusion

Nurses' hand hygiene behaviors at the intensive care unit were still low and could contribute to the colonization of *Staphylococcus aureus* on their cell phones. However, the results showed no relationship between the hand hygiene behavior and the colonization of *Staphylococcus aureus* on the cell phones of nurses. Further research is recommended to identify colonization before and after regular observations to determine whether there is any increase or decrease in colonization. Similar studies are also advised to conduct with larger sample size.

## Declaration of Conflicting Interest

The authors have no conflict of interest to declare.

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## Author Contributions

All authors contributed to the research concept. M.A. was in charge of developing the research proposal, performing data collection, data management and analysis, and drafting the manuscript. Y.I.P. performing data collection, while K.A., I.R., H.N., and H, supervised the proposal development, and provide critical revisions and complete the text. All authors approved the final version of the article.

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#### Data Availability Statement

All data generated or analyzed during this study are included in this published article.

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# Media use and behavioral disorders among Saudi Arabian children

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## Abstract

**Background:** Despite children's frequent use of electronic devices, there is a lack of evidence showing how such media use influences their behavior.

**Objective:** This study was to assess the relationship between media use and behavior among a sample of children aged three to 11 years.

**Methods:** This was a descriptive cross-sectional study. An electronic self-administered questionnaire was completed from January 2020 to March 2020 by a convenience sample of 234 parents with healthy children in the target age group. Descriptive statistics and One-Way Analysis of Variance (ANOVA) were used for data analysis.

**Results:** There was no significant difference in children's behavior according to the type of media [ $F(3, 230) = 1.673, p = 0.174$ ]. In contrast, there was a significant difference in children's behavior according to hours per day of media use [ $F(4, 229) = 2.701, p = 0.031$ ]. The most commonly used mobile device was the smartphone ( $n = 87, 37.2\%$ ). More than a quarter of the children spent three hours a day using media.

**Conclusions:** This study offers insight into associations between children's frequent media use and their behavior. The results suggest that the significant factor associated with behavioral problems is not the type of media but the time spent using it. Nurses are encouraged to use these findings in developing educational programs that raise awareness among parents and children regarding the consequences of excessive media use.

## Keywords

behavioral problem; smartphone; children; media; nursing; Saudi Arabia

Currently, individuals of all ages use media extensively to find information and connect with others all over the world (Zupanec et al., 2019). In this context, the term *media* refers to smartphones, videogames, tablets, game consoles, televisions, and computers. While media use can be favorable within certain limits, there is a risk of overuse. Indeed, the time spent using electronic devices continues to increase along with the growth in the range of available technologies. Media use among children has become a growing concern. The American Academy of Pediatrics (2016) recommends that children between age two and five years use media for only one hour a day, and children between six to 10 years use it for only 1.5 hours per day. Despite this recommendation, in Australian households, children's device use and internet access have risen from

72% in 2004–2005 to 97% in 2016–2017 (Reus & Mosley, 2018). Children's media use also has become a concern in Saudi Arabia. With the growing affordability of mobile devices, research has shown that the average time Saudi Arabian children spend using mobile devices was about two hours and 42 minutes (Statista Research Department, 2020). Furthermore, the number of internet users in Saudi Arabia is growing steadily, from 21.54 million in 2015 to 30.2 million in 2019 (Statista Research Department, 2020). This number is expected to reach 35 million in 2023 (Statista Research Department, 2020). Moreover, according to the General Authority of Statistics, 92.51% of Saudi families and 23.44% of children between five and nine use the internet (Al-Solami, 2019).

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Such high media use among children can come at a cost. Studies have shown that children with more media usage have a higher body mass index (BMI), less physical activity, and diminished rest and sleep than children with lower media usage (Reus & Mosley, 2018). Media use also can influence children's behavior. For example, children can become physically and verbally aggressive after excessive media use, sometimes imitating violent behaviors portrayed in mass media (Şengönül, 2017; Tanwar & Priyanka, 2016). The assessment of children's behavior in this study comprises a wide range of mental and social disorders. They include depression, overanxious, separation anxiety, relational aggression, oppositional defiant, inattention, impulsivity, and social problems with peers. Unfortunately, there is a lack of evidence about the specific relationship between media use and behavioral disorders in Saudi Arabian children. Therefore, the current study focused on Saudi children aged three to 11 years.

With portable digital devices (e.g., smartphones and tablets) becoming more available and affordable, the time children spend using them is increasing rapidly (American Academy of Pediatrics, 2013). In addition, with the significantly accelerated growth of video apps, learning packages, and instructional software for young children, incentives for children to use mobile devices have expanded, resulting in longer usage periods. Furthermore, mobile device manufacturers are targeting younger children. With this widespread increase in children's access to and usage of digital mobile devices—which has become an integral part of their lives—parents and researchers need to examine the effects of portable electronic media use (Paudel et al., 2016). Therefore, the current study aimed to determine if there is a relationship between media use and changes in children's behavior.

Researchers have suggested that frequent mobile media usage among children can intensify social loneliness, detract from social contact with family and friends, exacerbate emotional/behavioral issues, and possibly worsen social deficits (e.g., inattention, hyperactivity, peer problems, and emotional symptoms) (Hosokawa & Katsura, 2018; Poulain et al., 2018; Wu et al., 2017). Interestingly, other researchers found no correlation between device use and mental and behavioral problems in girls, while in boys, each hour spent playing video games was correlated with higher chances of exhibiting borderline/abnormal conduct problems and emotional issues (Mundy et al., 2017). Furthermore, increasing media use also has been shown to negatively affect sleep outcomes, resulting in more bedtime resistance, later bedtimes, and shorter sleep durations (Chindamo et al., 2019; Nathanson & Beyens, 2018; Wu et al., 2017). Moreover, longer TV watching periods have been linked to an increased likelihood of future self-regulation issues, while less television consumption is correlated with improved self-regulation (Cliff et al., 2018; Inoue et al., 2016). In contrast, one study showed that tablet usage contributed adversely to self-regulation only in children who

slept less at night (Nathanson & Beyens, 2018). Another study indicated that high levels of media consumption contribute to high BMIs and have a detrimental effect on athletic behaviors and motor abilities (Kaiser-Jovy et al., 2017). Finally, the aggressive behavior common in the media (especially in superhero programs) also can influence children's behaviors. A study showed that one year after pre-school children encountered superheroes via media, these children exhibited increased physical and emotional violence (Coyne et al., 2017). However, superhero engagement was not shown to be related to prosocial or defensive behaviors (Coyne et al., 2017).

## Methods

### Study Design

This was a descriptive cross-sectional study.

### Participants

G\*Power was utilized to calculate the needed sample size for this study (Faul et al., 2009). A priori analysis was employed to estimate the sample size for one sample means. The input parameters (alpha 0.05, power 0.80, and medium effect size 0.5) resulted in a recommended sample size of 67. The study's participants were a convenience sample of Saudi Arabian parents with healthy children between the ages of three to 11 years. The participants were the parents of children; thus, the ages of children who use media under the control and supervision of their parents were determined for the purpose of this study to be between three to 11 years. The study did not include individuals who were not parents or those with children under age three, over age 11, not exposed to media, or experiencing a medical problem.

### Instrument

The data were collected through an electronic survey created in Google Forms and shared through social media from January 2020 to March 2020. The authors of this study developed the first and second parts of the questionnaires. The first part of the questionnaire consisted of 10 items about sociodemographic factors: parent gender, age, marital status, employment status, number of individuals living in the household, monthly income, and education level, as well as child gender, age, and education level. The second part included multiple-choice questions about the child's media use (the type of media used and time spent using it). The last part consisted of items adopted from the parent version of the MacArthur Health and Behavior Questionnaire (HBQ) for middle childhood (Essex et al., 2002). The HBQ includes scales that assess children's mental health symptoms, physical health, social and school functioning. For the purpose of this study, only 44 items of HBQ addressed children's behaviors with regard to mental health symptoms (depression, overanxious, separation anxiety, relational aggression, oppositional defiant, conduct problems, overt hostility, inattention, and impulsivity) and social functioning (a social with peers and

prosocial behavior) were included. The HBQ requires the participant to check on the statement that applies to the behavior. The statements were assessed on a 3-point scale ranging from 0 (never or not true) to 2 (very true). The questionnaire was translated from English to Arabic using the back translation method, and the translated Arabic questionnaire was pilot-tested with five parents to ensure the clarity of items. To establish content validity, five Arabic-speaker specialists, including two doctoral-prepared and three master-prepared nurses in the field of pediatric nursing, evaluated the translated version of the HBQ and the relevance of the items to the concept of health and behavior. The HBQ (44 items) in this study demonstrated good internal consistency reliability with a Cronbach's alpha of 0.88.

### Data Analysis

Data were analyzed using SPSS software. Descriptive statistics (e.g., mean, percentages, frequencies, and standard deviation) were used to describe the study variables. One-Way Analysis of Variance (ANOVA) was employed to assess differences in children's behavior

according to type and time of media use. The level of statistical significance for statistical analysis was at 0.05.

### Ethical Consideration

Ethical approval was obtained from the Nursing Research Ethical Committee (NREC Serial No: Ref No 2B. 37). The study maintained participant confidentiality, and the parents' identities were not evident in any reports, presentations, or publications. Electronic informed consent was obtained from all participants before starting the questionnaires.

## Results

In total, 234 parents participated in the study. The majority of study participants (93.2%) were mothers between 30 and 50 years (78.2%). Most of the children (60.3%) were between five and ten years of age. Details on the other demographic variables are shown in Table 1.

**Table 1** Demographic variables of the study sample (*N*=234)

Variables		<i>N</i>	%
Parents	Mother	218	93.2
	Father	16	6.8
Participants' age	Less than 30 years	41	17.5
	From 30 to 50 years	183	78.2
	More than 50 years	9	3.8
Child's age	From 3 to 5 years	85	36.3
	From 6 to 8 years	105	44.9
	From 9 to 11 years	44	18.8
Sex of Child	Male	107	45.7
	Female	127	54.3
Marital status	Married	226	96.6
	Divorced	6	2.6
	Widowed	2	0.9
Employment status	Working full-time (35 hours per week)	80	34.2
	Working part-time	28	12.0
	Student	8	3.4
	Not working	118	50.4
Household	Less than five persons	125	53.4
	From five to ten persons	107	45.7
	More than ten persons	2	0.9
Household monthly income in Saudi Arabian Riyal (SAR)	SAR 3000 or Less	21	9.0
	SAR 3001–SAR 8000	73	31.2
	SAR 8001–SAR 13000	67	28.6
	More than SAR 13000	54	23.1
	Don't know	19	8.1
Educational level	Below high school	16	6.8
	High school	60	25.6
	Some college	14	6.0
	Bachelor's degree	130	55.6
	Master's degree or higher	14	6.0
Child's educational level	Kindergarten	59	25.2
	Grade 1	52	22.2
	Grade 2	31	13.2
	Grade 3	22	9.4
	Grade 4	31	13.2
	Not enrolled	39	16.7

As presented in Table 2, the results of One-way analysis of variance (ANOVA) revealed that there was no significant difference in children's behavior according to the type of media [ $F(3, 230) = 1.673, p = 0.174$ ]. In contrast, there was

a significant difference in children's behavior according to hours per day of media use as presented in Table 3 [ $F(4, 229) = 2.701, p = 0.031$ ].

**Table 2** One-way ANOVA of children behavior by type of media use

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	0.334	3	0.111	1.673	0.174
Within Groups	15.305	230	0.067		
Total	15.639	233			

**Table 3** One-way ANOVA of children behavior by hours per day of media use

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	0.705	4	0.176	2.701	0.031*
Within Groups	14.934	229	0.065		
Total	15.639	233			

\* $p < 0.05$

The most common types of media used were smartphones ( $n = 87, 37.2\%$ ). The least used media device was the PlayStation ( $n = 19, 8.1\%$ ). Detailed information on the most common types of media used among children is presented in Table 4.

**Table 4** Most common types of media used among children

Type of Media	f	%
Tablet/iPad	68	29.1
Smartphone	87	37.2
PlayStation	19	8.1
Television	60	25.6
Total	234	100.0

The average of time spent on media use were reported, the results indicated that, of the 234 children, 20 (8.5%) spent less than 30 minutes per day, 53 spent 30 minutes to 1.5 hours (22.6%), 47 (20.1%) spent between 1.5 to 2 hours, 54 (23.1%) spent two to three hours, and 60 (25.6%) spent more than three hours (Table 5).

**Table 5** Average of time spent on media use by children

Media Time	f	%
Less than 30 minutes	20	8.5
30 minutes to 1.5 hours	53	22.6
1.5 to 2 hours	47	20.1
2 to 3 hours	54	23.1
More than 3 hours	60	25.6
Total	234	100.0

## Discussion

The purpose of this study was to identify relationships between media use and behavioral disorders among a sample of Saudi Arabian children between the ages of three to 11 years. The results indicated that over a quarter

(25.6%) of the children in the sample spent more than three hours per day using mobile devices, which is far greater than the media limits recommended by the [American Academy of Pediatrics \(2016\)](#), one hour per day for two- to five-year-old and 1.5 hours per day for six- to ten-year-old. These results are concerning, as technology overuse can influence the growth of children and teenagers, as their brains are more sensitive to the effects of technology use and overuse than are adult brains ([Johnson, 2020](#)). Social media and electronic application use can also lead to psychological and physical difficulties (e.g., eyestrain, trouble concentrating on essential tasks, and poor academic achievement), which can lead to more serious health problems ([Mustafaoğlu et al., 2018](#)).

The study results also indicated that the children used various devices, ranging from stationary (television and game consoles) to portable devices (tablets and smartphones). The smartphone was the most frequently used device used, possibly due to its size and accessibility. Furthermore, because smartphones can run educational applications, parents may offer them to their children to keep them occupied and quiet in certain situations. Moreover, our findings aligned with those of other studies indicating that three-quarters of children have their own smartphones, and almost all children use them ([Kabali et al., 2015](#); [Setiadi et al., 2019](#)). Indeed, smartphone use can be positive or negative for children, depending on the type of programs used and how long they are used.

The current study results showed no significant relationship between physical problems without a medical cause and the type of media used or the time spent using it. This finding contrasts with other study findings indicating that long periods spent viewing TV, laptops, iPads, mobile phones, and video games can contribute to fatigue ([Boyd, 2020](#)). Furthermore, the absence of body and eye movement associated with using such devices can cause headaches ([Yle, 2014](#)).



The most important finding of the current study was the significant relationship between children's time spent in media use and behavioral disorders. This finding corroborates prior studies relating behavioral issues to time spent using media (Poulain et al., 2018; Wu et al., 2017).

### Implications of the Study

The finding that the time of media uses is significantly associated with children's behavior brings a different perspective to the media use for education, communication, and entertainment. Indeed, parents need such crucial information before deciding how much media their children should be allowed to consume. Nurses and future researchers can utilize results from this study to regulate the use of media among children. Nurses are encouraged to develop educational programs to raise awareness among parents and children regarding the consequences of excessive media use.

One obstacle to reducing children's excessive media use is adult media overuse, which can set a bad example for children. The authors of the current study recommend that parents adhere to the media usage hours recommended by the American Academy of Pediatrics (2016). Furthermore, individuals obliged to use media for long periods should consider the American Academy of Ophthalmology's 20-20-20 rule: for every 20 minutes of media use, shift your eyes and focus on an object at least 20 feet away, for at least 20 seconds (Boyd, 2020).

To expand upon these findings, future nursing research may replicate this study using the complete HBQ to assess children's physical health and school functioning in relation to media use. Furthermore, qualitative research could be conducted using interviews, observations, or focus groups to explore children's behavior secondary to media use. Moreover, larger sample sizes are needed to improve the generalization of results. Further randomized controlled trials are needed to examine the feasibility of interventions that regulate media use among children.

### Limitations of the Study

This study has some limitations. While using a cross-sectional design makes it possible to identify associations between media use and behavioral disorder, causality cannot be inferred. Next, these findings may not be generalizable due to the small sample size. Moreover, using an online questionnaire made it difficult for respondents to clarify some questions they may have found difficult to answer. Constructs of the HBQ in this study have not been confirmed by exploratory and confirmatory factor analysis.

### Conclusion

This study offers insights into the associations between frequent media use and children's behavior. While the type of media used does not seem to influence children's behavior, the time spent using media correlates with behavior problems. Therefore, it is concluded that the more

time a child spends using mobile devices, the more impact such use will have on their behaviors. Future nursing research is needed to examine the feasibility of programs that regulate media use among children

### Declaration of Conflicting Interest

The authors have no conflict of interest to declare.

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### Authors' Contributions

SA was responsible for the conceptualization, methodology, validation, and data interpretation. DB, HA, AA, and SA were responsible for literature review, data collection, analysis, and data interpretation. All authors contributed equally in writing, reviewing, and editing this manuscript.

### Data Availability Statement

The datasets generated or analyzed during the current study are available from the corresponding author on reasonable request.

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# Experience of healthcare workers in combatting COVID-19 in Indonesia: A descriptive qualitative study

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## Abstract

**Background:** The number of COVID-19 cases in Indonesia continues to rise. The roles and responsibilities of healthcare workers are crucial in the battle of the COVID-19.

**Objective:** This study aimed to explore the experience of healthcare workers in combatting COVID-19 in some parts of Indonesia.

**Methods:** This study employed a descriptive qualitative study design. Online semi-structured interviews were conducted in April 2020 among thirteen participants who were purposively selected. Data were analyzed using thematic analysis.

**Results:** Eight themes emerged from data, including lack of personal protective equipment, lack of referral hospitals and limited facilities, dealing with patients with unknown status, feeling worried about getting infected or being a source of viral transmission, being creative, too long shift and fatigue, being surrender to God, and government issues.

**Conclusion:** Findings of this study could be used as the input for the government, healthcare workers, and the general population in combatting COVID-19.

## Keywords

COVID-19; healthcare workers; Indonesia; experience; qualitative research; delivery of healthcare

Coronavirus Disease 2019, or called COVID-19, was first reported in Wuhan, China, on 31 December 2019, and it has spread across the world ([World Health Organization, 2020](#)). World Health Organization (WHO) has announced COVID-19 as a pandemic on 11 March 2020. As of 28 January 2021, 219 countries and areas were involved, with 101,433,090 confirmed cases, 2,184,120 confirmed deaths, and 73,320,448 recovered ([Worldometer, 2021](#)). In Indonesia, as of 28 January 2021, there are 10,242,298 confirmed cases, with 164,113 under care, 831,330 recovered, and 28,855 confirmed deaths ([Ministry of Health, 2021](#)). While COVID-19 is continuing to spread, each country and its communities must make efforts to prevent further transmission and reduce the outbreak's impacts ([Tosepu, Effendy, & Ahmad, 2020](#)).

Many countries have decided to lockdown, but Indonesia might be doubtful to do the same considering many factors, including business and economics. As a consequence, Indonesia is still struggling with new cases every day. In responding to the outbreak, health professionals are at the first line, and they are sacrificing their lives and put them at risk of infection ([Gunawan, Aungsucho, et al., 2020](#); [Tosepu, Effendy, Lestari, et al., 2020](#)). It is undebatable that their works are significant to save people's lives, particularly for those with COVID-19. However, the capacity of hospitals and the number of health workers are not in line with the number of cases that continue to rise. They are demanded to work extra while people are recommended to stay at home ([Gunawan, 2020](#); [Ketphan et al., 2020](#)).

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Given the importance of the roles of healthcare workers in the battle of COVID-19, this study aimed to explore how their experience in handling the cases, either with positive cases or suspected ones. There is no such study discussing this topic. Therefore, this study will provide the input and reference to decrease the incidence rate of COVID-19 and, importantly, to appreciate healthcare professionals' hard efforts in this battle.

## Methods

### Study Design

This was a descriptive qualitative study conducted in April 2020.

### Participants

The participants were purposively selected to explore more information regarding their experience in taking care of persons with positive COVID-19 or those still under control. The inclusion criteria of participants were all healthcare workers involved in the battle of COVID-19 in Indonesia.

### Data Collection

The respondents were contacted through a short message service (SMS) and phone call. Once they accepted the invitation, an appointment was scheduled for an online interview. The online semi-structured interview was conducted using the Indonesian language by principal investigators for approximately 30-60 minutes. The question guideline was prepared prior to data collection.

### Data Analysis

In this study, a thematic analysis was used for data analysis. Thematic analysis is a qualitative research method for identifying, analyzing, organizing, describing, and reporting themes found within a data set (Braun & Clarke, 2006). Thematic analysis is a useful method for examining the perspectives of different research participants, highlighting similarities and differences, and generating unanticipated insights (Braun & Clarke, 2006).

### Ethical Consideration

The ethical approval of this study was obtained from the Research Ethics Committee, Indonesian Public Health Association (IPHA), with approval number: 115/KEPK-IAKMI/IV/2020. Prior to data collection, the researchers explained the objective and the procedures of the study to the participants. It is also described that this study was voluntarily, which the participants could withdraw from the study at any time without penalty. The researchers in this study confirmed that each respondent had obtained appropriate informed consent. The researchers also guaranteed their data confidentiality and ensured them that their information would be published anonymously.

### Trustworthiness

To ensure the trustworthiness of this study, we discussed among researchers and experts to ensure that there was

no bias in analyzing and developing the themes. All researchers were agreed with all findings. Member checking was also done to validate the results, as it is the most critical technique to establish credibility (Gunawan, 2015).

## Results

### Characteristics of the Participants

Thirteen respondents were included in this study, which consisted of four medical doctors (30.7%), three nurses (23.1%), three public health practitioners (23.1%), one midwife (7.7%), one member of the surveillance team (7.7%), and one health analyst (7.7%). The average age was 36 years. The majority of the respondents were females (53.85%) than males (46.15%). The participants were working at East Luwu Regency South Sulawesi, Konawe Regency Southeast Sulawesi, and Papua. Of all participants, ten participants (76.9%) were married, and three participants (23.1%) were single. Eight participants (61.5%) were working at hospitals, four participants (30.8%) were at public health centers, and one participant (7.7%) was at the Department of Health.

### Analytical Findings

Eight themes emerged from the data. Each is explained in the following:

#### **Theme 1: Lack of Personal Protective Equipment (PPE)**

The majority of respondents agreed that there was a lack of personal protective equipment, especially facial masks, and protective clothing. This is explained in the following statements:

- PPE is still limited in our workplace (p3)
- We have a lack of PPE based on a standard to take care of patients with COVID-19 or those who are under evaluation (p9)

#### **Theme 2: Lack of referral hospitals and limited facilities**

Most respondents agreed that there is a limited number of referral hospitals appointed by the Government of Indonesia. In addition, the existing hospitals have limited infrastructures. This is explained in the following:

- Too limited referral hospitals appointed by the government to deal (p6)
- Referral hospitals exist, but with inadequate facilities. For example, in intensive care units, the beds and ventilators are limited (p5)
- In terms of infrastructure, we have not enough quality and quantity; for example, ventilators, intensive care units, and the number of health workers are also limited (p2)

#### **Theme 3: Dealing with patients with unknown status**

The majority of respondents said that they most likely dealt with unknown status, which put them at risk of infection.

Besides, many patients did not tell the truth about their conditions, traveling histories, and previous contacts. The respondents said:

- In the emergency unit, many patients who come but have not yet found out whether they were positive or not, but they were positive eventually. Try to imagine our situation, and we were without PPE or less than the standard to serve these patients (p12)
- Once the patient has shown symptoms of COVID-19, which has been served by nurses, then an examination is carried out, and it turns out positive, which eventually nurses are contaminated and infected with COVID-19.
- Patients were most likely dishonest with health workers about traveling or from a pandemic area (red zone) because of fear of being said to be people under observation. They were also dishonest if they have a history of contact with patients with positive COVID-19 and the symptoms. One patient was also dishonest that he had been examined at another hospital and was positive but refused to be treated.

#### **Theme 4: Feeling worried about getting infected or being a source of viral transmission**

The majority of respondents felt worried due to the lack of protective equipment. They were also worried that they would bring the virus to their homes and infect the family. It is explained in the following:

- This is the dilemma of medical staff who is in direct contact with patients. We must be anxious that we may bring "gift" from the hospital to family at home (p2, p10)
- Concerned about the potential for this patient to transmit to others and themselves, worry about the patient's prognosis and the clarity of the patient's diagnosis because, in this place, the facilities are very minimal (p4)
- Worried to be infected (p8)
- Feeling worried because PPE is very limited (p9, p10, p11, p12)

#### **Theme 5: Being creative**

Due to a lack of PPE, healthcare workers are demanded to be creative. Some modified the masks, and some were wearing raincoats for their protection. It is explained in the following:

- We can modify it by using alternative PPE even though the protection strength is not as good as the standard PPE (p2)
- We still use a raincoat as a personal protector (p3, p8)
- Yes, we use the raincoat at the public health center when we meet patients (p7)

#### **Theme 6: Too long shift and fatigue**

Some respondents thought that their shift is too long due to the spread of the virus is very fast. The other said that they felt uncomfortable wearing the protective clothing for such a long time. The respondents said:

- An eight-hour shift is dangerous because, in the current situation, the risk of contracting COVID-19 is very high (p5, p10)
- During an outbreak, I think this 8-hour shift is dangerous because the transmission of COVID-19 is very fast, and we do not know who is infected (p7)
- Eight hours is too long; considering the discomfort when using PPE, it should be even shorter (p4)
- Nurses work hard because of the many patients they serve. They feel fatigued, finally, their immunity drops, and the possibility of contracting COVID-19, which then they need to have isolation with positive status and eventually died (p12)

#### **Theme 7: Being surrender to God**

As all health professionals are at risk of being infected, all agreed they remember God, pray, and give all things to the Creator. The respondents said:

- We just pray and zikr, remembering God that we will return one day (p1)
- We do our best, and everything cannot happen without the will of the Creator (p4)
- I am being surrendered to God; it is our job to save lives (p8)

#### **Theme 8: Government Issues**

All respondents had given the critics or inputs to the government related to the policy, massive test, PPE, and physical distancing. It is explained in the following:

- Underestimating the pandemic (p2)
- Too slow in deciding a policy (p2)
- The government cannot conduct massive tests to detect as many cases as possible for early treatment (p2)
- The government cannot meet the PPE needs of medical personnel (p2)
- The government has failed to control the prices of PPE that are sold at unreasonable prices (p2)
- The government failed to limit the visit of foreign nationals from the beginning before COVID-19 became a pandemic (p2)
- Our society seems to ignore the social/physical distancing (p2), so we all need to emphasize all elements of society to do physical distancing (all respondents)

## **Discussion**

This study aimed to explore the experiences of healthcare workers in combatting COVID-19 in Indonesia. Eight themes emerged from the data, which were discussed in the following:

The theme *lack of PPE* is related to the personal protection of healthcare workers, especially for medical doctors and nurses who provide direct care to the patients. This theme is in line with a study by [Gunawan et al. \(2021\)](#). However, personal protective equipment is very important



to protect the mucosa - mouth, nose, and eyes from droplets and contaminated fluids. The hands are known to transmit pathogens to other parts of the body or other individuals. Hand hygiene and gloves are very important in protecting health workers and preventing transmission to others (Juthamane, 2020). Face masks, protecting clothes, and headgear are also considered important to prevent transmission to healthcare workers (Tosepu, Gunawan, et al., 2020).

The theme *lack of referral hospitals and limited facilities* indicates that the number of referral hospitals for COVID-19 is limited if seen from the increased number of positive cases every day. In addition, several hospitals appointed by the government to handle the COVID-19 outbreak are now in the public spotlight. Not because of the satisfying service, but because of inadequate facilities. Some government hospitals have isolation rooms with small capacity and close screening services. This is in line with Marison (2020) said that there were six patients with suspect COVID-19 in a small isolation room in a hospital. A distance of two meters, called the safe distance to prevent the spread of the virus, is not applied in this room. In fact, some patients ended up using a wheelchair and sleeping on the floor without getting a mattress.

Under the theme *dealing with patients with unknown status*, it indicates two missing points: there is no rapid test at the regional hospitals to find out the initial status of the patients quickly, so it is too late to anticipate the transmission of the virus to medical personnel. Second, many patients were not honest about their history of travel to the red zone (infected area) and COVID-19 symptoms. As a result, many doctors and nurses died from COVID-19. This patient dishonesty is due to misunderstanding and stigma that have arisen in the community (Gunawan, Juthamane, et al., 2020).

The theme *feeling worried about getting infected or being a source of viral transmission* is understandable. Being health personnel who provides direct care to patients with COVID-19 requires caution, accuracy, focus, and always be vigilant. It is not impossible they can be infected and even transmit to others, especially families at home (Gunawan, Juthamane, et al., 2020; Visagie, 2020). Worry is also closely related to the first and second themes, which are related to the lack of facilities.

The theme *being creative* is the response to the lack of facilities in hospitals—many nurses, doctors, and other medical personnel use raincoats to protect them. Salute for creativity, but sad if thinking about the risks. Besides, the theme *too long shift & fatigue* indicates that doctors, nurses, and other medical personnel are also human beings who need rest to enhance their immunity (Gunawan, Aunguroch, et al., 2020). Eight hours shift with many patients and a high level of focus and alertness requires extra energy. So that hospital managers need to increase the number of available staff or shorten the shift schedule to reduce the risk of COVID-19 transmission to medical staff.

The theme *being surrender to God* indicates that the healthcare workers believe every human will die in due course. Treating patients with COVID-19 has many risks, but apart from that, we can only surrender to God and believe that God will always protect our family and us. Surrender does not mean weak, but rather a combination of effort and prayer for the best of humankind. It is considered one of the coping mechanisms among them.

The theme *government issues* indicate the government's unpreparedness in dealing with the pandemic, making the people's anxiety and emotions begin to increase. The government policy in dealing with the spread of the COVID-19 pandemic has not successfully decreased the transmission rate. It is not only about the lack of facilities, but also about the inconsistency to make decisions to do a massive test, limit the entrance of foreigners, and maximize the prevention in the community. Besides, the Ministry of Health policy regulates the COVID-19 National Referral Laboratory can only issue examination results. This has made it difficult to identify and potentially hide the seriousness of the problem. Therefore, more disclosures were found to be infected with COVID-19 after the victim died. The government also needs to disclose information, including the location of infected patients and travel history, while still ensuring the protection of the personal data of patients. It is also necessary to ask the government to clarify the mechanism and effectiveness of mass tests and not impose their costs on the people. Apart from the role of the government, it also needs to be emphasized that battling COVID-19 also needs the part of the community, especially in implementing physical distancing, because a lot of our people seem to ignore it (Tosepu, Gunawan, et al., 2020).

The implications of this study include the need for additional PPE for health professionals, especially for nurses and medical doctors who make direct contact with patients, and the addition of the appointment of referral hospitals with complete facilities. It is also necessary to increase the number of health workers immediately to reduce fatigue that puts them at risk. The sample in this study might not represent the whole context of healthcare workers in Indonesia, which only involved several health professions. The settings of the study were also not representing the whole Indonesian context. Therefore, further study is needed with a bigger and equal sample size and equal settings to generalize the findings among the healthcare workers.

## Conclusion

Eight themes were emerged from this study related to the lack of PPE and infrastructure, psychosocial problems, creativity, fatigue, and the roles of the government in handling COVID-19 in Indonesia. The results of this study can be input to the government to be more active and decisive in making decisions and pay more attention to human life than other interests.



## Declaration of Conflicting Interest

The authors declare no conflicts of interest.

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## Author Contribution

Criteria	Author Initials
Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;	RT, JG, YA, DSE, MRHN, FM, AS, DI
Involved in drafting the manuscript or revising it critically for important intellectual content;	RT, JG, YA, DSE
Given final approval of the version to be published. Each author should have participated sufficiently in work to take public responsibility for appropriate portions of the content;	RT, JG, YA, DSE, MRHN, FM, AS, DI
Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.	RT, JG, YA, DSE, MRHN, FM, AS, DI

## Data Available Statement

All data generated or analyzed during this study are included in this published article.

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# Protective role of resilience on COVID-19 impact on the quality of life of nursing students in the Philippines

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## Abstract

**Background:** Studies have shown that resilience has a buffering effect on mental health problems. However, the influence of resilience on the impact on the Quality of Life (QoL) in the context of the COVID-19 pandemic has not been well documented.

**Objective:** This study examined the influence of resilience on the COVID-19 impact on QoL among nursing students.

**Methods:** A cross-sectional research design was utilized. Three hundred and forty-five students of a government-funded nursing school in the Philippines responded in the web-based survey. Data were gathered using two adopted instruments from 18 to 31 August 2020. Test for differences and correlational analyses were performed.

**Results:** The COVID-19 pandemic had a moderate impact on the QoL of nursing students. The COVID-19 impact on QoL significantly varied with sex and the nearby presence of COVID-19 cases. Bivariate analysis revealed a significant moderate inverse relationship between psychological resilience and the impact of COVID-19 on QoL.

**Conclusion:** Resilience has a protective influence on the impact on QoL concerning main areas of mental health in the context of the COVID-19 pandemic. Understanding the factors and developing interventions that build the resilience of students is a focal point of action for nursing schools.

## Keywords

COVID-19; mental health; nursing; quality of life; resilience; Philippines

As of 6 January 2021, the number of Coronavirus Disease 2019 (COVID-19) confirmed cases worldwide had reached 84,780,171, including 1,853,525 deaths (World Health Organization, 2021). In the Philippines, the number of infected with COVID-19 has reached 480,737, with 9,347 deaths (Philippine Department of Health, 2021). During these difficult times, every one of us finds ourselves in dire straits due to healthcare problems, physical and mental exhaustion, and academic burnout caused by the COVID-19. Health protocols were then implemented to take efficient actions to eradicate and slow down the spread of the disease, and with that, due to numerous cases of COVID-19 since December 2019, and taking into account the potential spread of COVID-19 in schools, respective

countries were suddenly forced to shift from face-to-face classes to online classes (Guillasper et al., 2020; Moralista & Oducado, 2020; Silva, 2020). From that standpoint, the pandemic has caused students, as well as staff and faculty, to experience psychological distress because of the sudden changes in their everyday living. The COVID-19 outbreak has significantly impacted nursing students (Usher et al., 2020), and nursing students' stress increased during the lockdown period (Gallego-Gómez et al., 2020). Mental health problems have become critical issues during the pandemic and in the new normal era (Gunawan et al., 2020). These pandemic-related changes, particularly in regards to online classes, social distancing - since social support plays a significant role in easing risks and is known

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as a coping strategy, and anxiety due to health and economic concerns are likely to remain as a long-term stressor (Liu et al., 2020). On the other hand, putting the pandemic aside, several studies show that nursing students face a great number of difficulties during clinical practices to improve their professional skills (Akhu-Zaheya et al., 2015). The stress experienced by nursing students in the clinical setting is mainly affiliated to care of the patient, death of a patient, nursing diagnosis, and the negative impact given by hospital staff and clinical instructors (Bhurtun et al., 2019) and that clinical setting stressors are much perceived in comparison to academic and external stressors (Jimenez et al., 2010).

On that note, with the countless problems encountered by nursing students, resilience is a key component to recuperate and recover from such distress and issues. Resilience is defined as the ability to overcome adversity and cope effectively in problems faced - which also includes how one learns to develop stronger flexibility from situations encountered (Rutter, 2008; Thomas & Revell, 2016). Since the nursing profession is stressful, this can impact students having a myriad of adverse outcomes on the quality of learning and the QoL (Goff, 2011). Thus, the ability of nursing students to bounce back or personal resilience is essential to acquire internal control, empathy, positive self-concept, organization, and optimism in their everyday challenges. Coherence with family, social environment, physical environment, wisdom, and supportive mindset can help boost one's values, resulting in healthier outcomes, and help those traumatized with distress effectively adapt instead of rooting through their vulnerability (McAllister & McKinnon, 2009).

Without a doubt, nursing is one of the most challenging professions there is in the world; it requires a whole lot of passion, perseverance, and heart from nurses to face another tomorrow. This leads to show how resiliency holds so much vitality in the field of nursing (Chow et al., 2018). Resilience, or the ability to recover or bounce back from stress (Smith et al., 2008), is a process of progressive success in facing adversities (Chow et al., 2018) which anyone could learn through experiences.

Meanwhile, previous studies conducted before the pandemic have shown that resilience has a buffering effect or protective role on mental health problems, depression, and stress among nursing students (Mcdermott et al., 2020; Sam & Lee, 2020). However, the role of resilience on the impact on the QoL during or in the context of the COVID-19 pandemic among nursing students has not been explored or investigated. To our knowledge, this is one of the first papers that looked into the role of resilience among nursing students in the context of the COVID-19 pandemic. It was earlier proposed how resilience varies across cultures due to ecological and cultural indexes that may be found across different nations (Ungar, 2008).

Moreover, despite the availability of studies that looked into the mental health of students during the pandemic, these were conducted among the general population and students in higher education (Aristovnik et al., 2020; Tee et

al., 2020), but research specifically among nursing students in the Philippines is scarce. Studies conducted among nursing students, on the other hand, focused on levels of stress (Alateeq et al., 2020; Aslan & Pekince, 2020) and fear (Oducado, Tuppal, et al., 2021) and not particularly on the COVID-19 impact on QoL concerning mental health. Hence, the study was conducted to determine the influence of resilience on the impact of COVID-19 on the QoL concerning mental health among nursing students. In addition, since prior studies have shown that stress, fear, and other negative emotional responses related to the COVID-19 pandemic varied according to some personal characteristics (Alateeq et al., 2020; Aristovnik et al., 2020; Aslan & Pekince, 2020), it may also be necessary to examine whether COVID-19 impact among nursing students significantly differ according to demographic characteristics, the existence of a local case of COVID-19 near their residence, and the presence of any medical condition that might increase their risk for severe illness from COVID-19.

## Methods

### Study Design

A cross-sectional research design was employed in this study.

### Participants

Three hundred and forty-five (n=345) responded in the online survey. A response rate of 59.38% (345/581) was obtained in this study. This study was conducted in one government-funded nursing school in the Central Luzon part of the Philippines.

### Instruments

The Brief Resilience Scale (BRS) and COVID-19 Impact on Quality of Life (COV19-QoL) were adopted for this study. Permission to use the scales was granted by tool developers. The BRS by Smith et al. (2008) was utilized to measure nursing students' ability to recover or bounce back from stress. Participants answered on a five-point Likert scale (1 – "strongly disagree" to 5 – "strongly agree"). The BRS had a reported Cronbach's  $\alpha = .80-.91$  (Smith et al., 2008). The COV19-QoL by Repišti et al. (2020) was used to assess the impact of the pandemic on the QoL in relation to mental health for the last seven days. Participants responded on a five-point Likert scale (1 – "totally disagree" to 5 – "completely agree"). The COV19-QoL had a reported Cronbach's  $\alpha = .90$  among Filipino samples (Rabacal et al., 2020). The following scale of means was used to interpret that data: low = 1.00-2.33; moderate = 2.34-3.66; and high = 3.67-5.00. The survey was administered in the English language. Demographic information (sex, year level, place of residence, estimated monthly family income) were also collected. The participants were also asked about the presence of a local case of COVID-19 near their residence and if they have any

medical condition that might increase their risk for severe illness from COVID-19.

### Data Collection

The web-based survey was administered for two weeks or fourteen days from 18 to 31 August 2020. The online survey was the only practicable means of gathering data during the COVID-19 outbreak. The link to the online survey via Google forms was sent to the email address and Facebook groups of the students. Students were also encouraged to share the link of the survey with their classmates.

### Ethical Considerations

This study was approved by the San Beda University-Research Ethics Board (SBU-REB) with Protocol Number 2020-041. Administrative clearance was also granted to conduct the research. Full disclosure about the study was given at the start of the survey. Students were reminded that they have the freedom to participate in the study, which will not affect their grades. They were also informed that proceeding and completing the survey implies consent to participate in the study voluntarily. Identifiable information was coded to maintain anonymity and confidentiality. Data were stored in password-protected computers for access and retrieval. There were no missing data in our study since all questions were made mandatory before completing the survey.

### Data Analysis

Statistical data analysis was carried out via the IBM SPSS version 23. Descriptive statistics for continuous variables were expressed as mean (*M*), standard deviation (*SD*), while categorical variables were expressed as frequency (*f*) and percentage (%). The Kolmogorov-Smirnov and Shapiro Wilk tests suggested that data do not significantly deviate from the normal distribution. The *t*-test for the Independent Samples and one-way ANOVA with Scheffe post hoc test were used to test for differences, while the Pearson's product-moment correlation coefficient was utilized to correlate selected variables. A *p*-value less than .05 was considered significant.

### Results

Presented in Table 1 are the demographics and descriptive data of the independent variables of the study. The mean age of participants was 19.92 (*SD* = 1.26). The majority were females (80.6%), in second-year level (47.8%), living in rural areas of the province (56.8%), reported the presence of a COVID-19 case near their residence (44.9%), and had no medical condition that might increase the risk for severe COVID-19 illness (89.6%). Most students had an estimated monthly family income of less than 400 USD: 200 USD to less than 400 USD (35.1%) and less than 200 USD (33%). The composite score in the BRS was 3.04 (*SD* = .51).

**Table 1** Demographics and descriptive data of independent variables (*N* = 345)

Variables	<i>M</i>	<i>SD</i>	<i>n</i>	%
<b>Sex</b>				
Male			67	19.4
Female			278	80.6
<b>Year level</b>				
Third & Fourth			50	14.5
Second			165	47.8
First			130	37.7
<b>Place of residence</b>				
Urban/City			149	43.2
Rural/Town			196	56.8
<b>Estimated monthly family income</b>				
PHP 20,000 and above (400 USD and above)			110	31.9
PHP 10,000 to 19,999 (200 to < 400 USD)			121	35.1
PHP below 10,000 (< 200 USD)			114	33.0
<b>Presence of COVID-19 case near their residence</b>				
Yes			155	44.9
No			99	28.7
Unsure			91	26.4
<b>Presence of a medical condition</b>				
Yes			36	10.4
No			309	89.6
<b>Age (years)</b>	19.92	1.26		
<b>Resilience</b>	3.04	.51		

Note: 1 USD = 50 PHP

Table 2 shows that the composite score in the COV19-QoL was 3.35 (*SD* = .80). The COVID-19 pandemic had the highest impact on nursing students' personal safety (*M* =

3.91; *SD* = 1.04) and had the lowest impact on nursing students' feeling of depression (*M* = 2.99; *SD* = 1.30).

**Table 2** COVID-19 impact on QoL

Items on COV19-QoL	<i>M</i>	<i>SD</i>
I feel that my personal safety is at risk	3.91	1.04
I feel more tense than before	3.61	1.05
I think my quality of life is lower than before	3.39	1.00
I think my mental health has deteriorated	3.13	1.18
I think my physical health may deteriorate	3.05	1.06
I feel more depressed than before	2.99	1.30
Composite score	3.35	.80

It is shown in Table 3 that there were significant differences in the COVID-19 impact on QoL of nursing according to sex ( $t = -2.713$ ;  $p = .008$ ) and the presence of a COVID-19 case near their residence ( $F = 5.622$ ;  $p = .004$ ). The bivariate

analysis also revealed a significant moderate inverse relationship ( $r = -.363$ ;  $p = .000$ ) between psychological resilience and the impact of COVID-19 on QoL concerning main areas of mental health.

**Table 3** Differences in and correlation with COVID-19 impact on QoL

Variables	<i>M</i>	<i>SD</i>	<i>t statistics</i>	<i>p-value</i>
<b>Sex<sup>†</sup></b>			-2.713*	.008
Male	3.10	.856		
Female	3.41	.764		
<b>Year level<sup>†</sup></b>			.054	.605
Third & Fourth	3.30	.736		
Second	3.39	.784		
First	3.31	.822		
<b>Place of residence<sup>†</sup></b>			.464	.643
Urban/City	3.37	.814		
Rural/Town	3.33	.774		
<b>Estimated monthly family income<sup>‡</sup></b>			.917	.401
PHP 20,000 and above (400 USD and above)	3.27	.870		
PHP 10,000 to 19,999 (200 to < 400 USD)	3.41	.758		
PHP below 10,000 (< 200 USD)	3.35	.743		
<b>Presence of COVID-19 case near their residence<sup>‡</sup></b>			5.622*	.004
Yes	3.44	.788		
No	3.12	.783		
Unsure	3.42	.763		
<b>Presence of medical condition<sup>†</sup></b>			.452	.653
Yes	3.39	.095		
No	3.34	.046		
<b>Age<sup>§</sup></b>			-.060	.263
<b>Resilience<sup>§</sup></b>			-.363*	.000

<sup>†</sup>t-test for the independent group, <sup>‡</sup>ANOVA with Scheffe post hoc test, <sup>§</sup>Pearson's  $r$ , \* $p < .05$

## Discussion

This study looked into the association of resilience on the COVID-19 impact on the QoL of nursing students. This study indicated that resilience was inversely or negatively related to the impact of COVID-19 on QoL among nursing students. The result suggests that the higher the resilience, the lesser is the impact of COVID-19 on the QoL of nursing students. This finding is consistent with other studies disclosing the inverse or negative association between resilience with patterns of COVID-19 stress, fear, anxiety, and depression (Barzilay et al., 2020; Ferreira et al., 2020; Oducado, Parreño-Lachica, et al., 2021; Zhang et al., 2020). The finding of the study further indicates that resilience has a protective role or buffering effect on the negative impact of the COVID-19 pandemic. Nursing schools may need to craft interventions that build the resilience of nursing students. Because resilience can be

seen as a dynamic adaptation process (Chmitorz et al., 2018), students can be potentially trained to harness their resilient traits. A resilience-training program (Helmreich et al., 2017; Joyce et al., 2018) may be conducted to improve students' ability to respond to stressful events and other negative psychological and emotional distress like during the COVID-19 pandemic.

Moreover, we also found that the COVID-19 impacted the QoL of nursing students to a moderate extent. Similarly, a moderate level of stress was noted among nursing students in Turkey during the COVID-19 pandemic (Aslan & Pekince, 2020), and students in the Philippines reported moderate to severe psychological impact of the COVID-19 pandemic (Tee et al., 2020). Meanwhile, the mean composite score in the COV19-QoL scale was 3.04 in this study was slightly higher compared to the QoL of people with no mental health-related diagnoses in Croatia ( $M = 2.91$ ) (Repišti et al., 2020) and Filipino teachers in the



Philippines ( $M = 2.75$ ) (Rabacal et al., 2020). Nevertheless, the finding of this study proposes that the COVID-19 pandemic has undoubtedly affected the lives of nursing students. This necessitates the development of preventive strategies to address the impact of COVID-19 on the QoL of nursing students.

This study also demonstrated that the impact of the COVID-19 on QoL was significantly higher among female nursing students. Consistent with the literature, females had higher stress levels than their male counterparts in a sample of nursing students in Turkey (Aslan & Pekince, 2020), students in Saudi Arabia (Alateeq et al., 2020), residents in Australia (Rahman et al., 2020) and teachers and students in the Philippines (Oducado, Rabacal, et al., 2021; Tee et al., 2020). Even the result of a global survey in higher education also noted that females are more affected by the pandemic in their personal and emotional lives (Aristovnik et al., 2020). Along with hormonal changes and their thoughts about their social situation, women tend to be more emotional; thus, they may perceive a more significant impact of stressful life events like the COVID-19 pandemic (Alateeq et al., 2020; Aristovnik et al., 2020; Aslan & Pekince, 2020).

In this study, the impact of COVID-19 on QoL was significantly higher among nursing students who were unsure or who knew of a nearby presence of a COVID-19 case near their residence. It is also noteworthy that nursing students posted the greatest impact of COVID-19 on their personal safety in our study. Similarly, studies noted that higher levels of anxiety, anger, and fear were associated with closer spatial distance from active COVID-19 cases (Huang et al., 2020; Oducado, Tuppal, et al., 2021). Perhaps, students may perceive that the presence of COVID-19 case near their residence may increase their risk of getting infected by the coronavirus thus may have reported a greater impact on their QoL. Personal experience with coronavirus was a significant predictor of risk perception (Dryhurst et al., 2020); at the same time, perceived risk was significantly related to COVID-19 stress (Oducado, Rabacal, et al., 2021). Correspondingly, providing care to known or suspected cases and direct contact with a confirmed case of COVID-19 were associated with a higher level of fear (Rahman et al., 2020) and depression (Tee et al., 2020).

This study is not without shortcomings that could be addressed in future research. This study only involved nursing students in one school in the Philippines. The findings of this study cannot be generalized to all nursing students locally and internationally. The research design (cross-sectional) cannot conclude the causal effect among the study variables; likewise, it cannot track temporal changes over time. Hence, our study only examined the correlation and not the causal effect between resilience and COVID-19 impact. Also, the use of online survey questionnaires lends itself to social desirability and self-reported bias. Nonetheless, the present study contributes to a better understanding of the impact of the COVID-19 pandemic among nursing students.

## Conclusion

The COVID-19 outbreak has eventually affected the QoL of nursing students. It is casting concern not only on their physical health and safety but also on their psychological health and mental well-being related to QoL. Additionally, female nursing students and those in nearby presence of COVID-19 case or unsure of a COVID-19 case near their residence are more vulnerable to the impact of COVID-19 on their QoL. Failure to recognize the negative effect of the COVID-19 pandemic and other major life events on the QoL of nursing students may result in detrimental consequences. Furthermore, our study concludes by highlighting the protective and cushioning role of psychological resilience on the QoL in the context of the COVID-19 pandemic. Resilience is a vital psychological factor and personal resource that makes nursing students less susceptible to the negative impact of the COVID-19 outbreak and helps reduce the adverse impact of the pandemic on the QoL of nursing students. Understanding the factors and developing strategies that build the resilience of students is a focal point of action for nursing schools.

## Declaration of Conflicting Interest

The authors have no conflict of interest to declare.

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## Author Contribution

All authors have made a substantial contribution from conception to the finalization of this study. JNG was in charge of the acquisition of data and revising the article for important intellectual content. RMFO was involved in the conception and design of the study, analysis, and interpretation of data, and drafting the article. GPS was part of the conception and design of the study and revising the article for important intellectual content. All authors approved the final version of the article.

## Data Availability Statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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# Nurses' roles in palliative care: An Islamic perspective

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## Abstract

Palliative care is an important approach for nurses to improve the quality of life of patients holistically and mitigate suffering among the patients in critical condition and near to death. This article provides an Islamic perspective about nurses' roles in palliative care, which can be applied worldwide, especially in Muslim-majority countries. Understanding Islamic beliefs will help nurses provide professional and culturally sensitive nursing care. In its principle, Islam always respects the process of life until death comes. So, the application of Islamic values in palliative care will make the patients accept their ill condition completely, keep being close to Allah SWT (God), and die peacefully. The concepts of illness, death, early action on the dead, and palliative care application in nursing are explained in this article to open up new ideas rather than provide definitive answers. We hope that this perspective will highlight healthcare policymakers the need to integrate Islamic values in nursing practice.

## Keywords

Islam; quality of life; palliative; spirituality; grief; nursing

Islam views that humans are the perfect creatures (Al-Ghazali, 2007). However, Allah explains that humans will experience weak physical conditions (illness). It is cited in the Holy Qur'an (30:54), *"It is Allah Who created you in a state of weakness; then after weakness, He gave you strength, then after strength, He made you weak and old. He creates what He pleases. He is All-Knowing, All-Powerful"*. This verse gives a signal that humans were created weak (at birth) then become strong then turn gray (weak, old, or sick) which needs treatment". Therefore, the role of palliative care is significant in Islam, as every human will be weak when they get old.

Palliative care can be provided in various contexts, such as hospitals, outpatients, and home settings, and applied according to cultural beliefs. This article offers an Islamic perspective about nurses' roles in palliative care, which can be used worldwide, especially in Muslim-majority countries. The total population of Muslims in the world in 2015 reached 1.9 billion (World Population Review, 2020), and by 2050 it is predicted that Islam will spread and grow faster than other religions in the world (Leong et al., 2016).

World Health Organization (WHO) explains that palliative care is an approach to improving the patients' life quality and their families in dealing with life-threatening

diseases. It includes prevention and cure of suffering through early detection, assessment, and treatment of illness and other conditions, including biological, psychological, social, and spiritual conditions (World Palliative Care Alliance, 2014). In providing care to palliative patients, nurses must involve the patient's awareness, faith, and belief (Dewiyuliana et al., 2019; Rassool, 2015). According to Muishout et al. (2018), all Muslim patients who experience palliative care always want a good death (or *Husnul Khotimah*) and get good care according to the expected standard. Understanding Islamic beliefs will help nurses provide professional and culturally sensitive nursing care. It might happen by implementing religion, family perceptions, health, illness, medicine, and privacy issues (Attum et al., 2018).

Death or nearly death is a current issue in terminal patients (Zahedi et al., 2007). It cannot be denied that Muslim nurses' role is crucial, especially in providing palliative nursing care. The Prophet Muhammad SAW said that Allah SWT would not bring down a disease other than to bring down the antidote, except one: old age/death. This is explained in the Hadith of Sahih Muslim (43).

This article aims to open up new ideas rather than provide a definitive answer.

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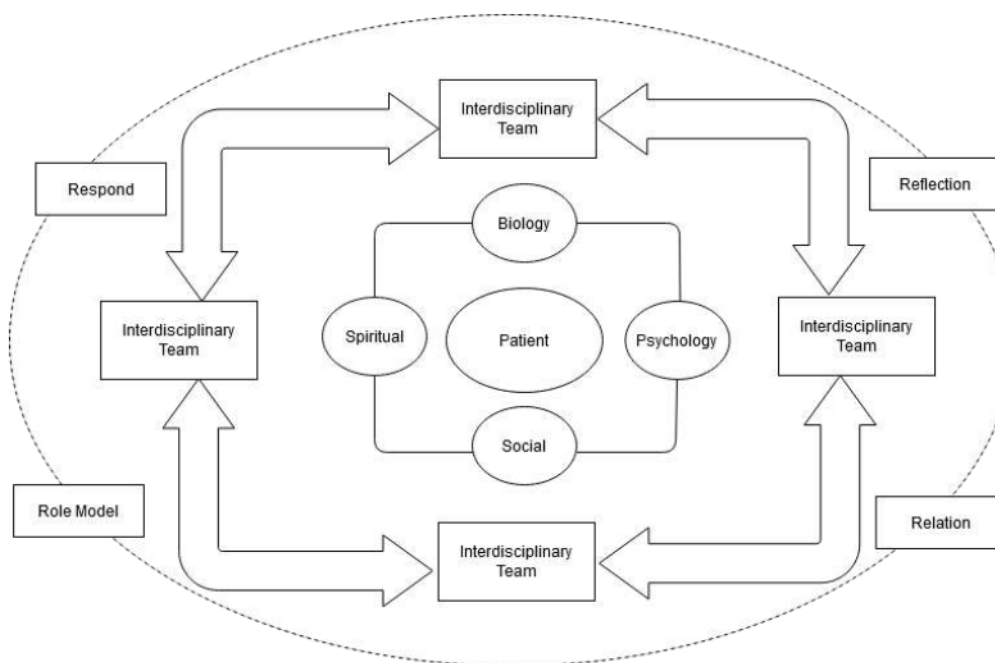
## Palliative Care Aspects

Some aspects that must be considered in providing palliative nursing care, including (1) upholding ethical aspects of care (nonmaleficence, justice, autonomy, and beneficence), maintaining politeness and respect, patient environmental cleanliness, social aspects, prayer (praying or praying for), (2) conveying what is being experienced by the patient (being honest with the patient), (3) giving opioids and sedatives, (4) giving healthy diets, (5) preparing for death and mourning, (6) completing all patient's affairs, and (7) increasing worship (Al-Shahri & Al-Khenaizan, 2005). The other aspects are prayer, medical care, freedom of religious practice, modesty, professional care, pain management, and mental problems coping (Boucher et al., 2017).

When someone is nearly dead or in a critical condition, it is necessary to increase one's closeness to God (in the form of worship) (Choong, 2015). Therefore, the interaction and trust between patients and nurses or other health workers should be enhanced (Al-Jahdali et al., 2013) to provide a positive end to life (Rosemond et al., 2017). In other words, palliative care should include bio-psycho-socio-spiritual aspects for families and patients (Hagan et

al., 2018). According to Barolia (2008), the core category of caring is maintaining the balance of five dimensions (physical, ethical, moral, spiritual, and intellectual) of human beings through response, reflections, relationships, relatedness, and role modeling. Besides, nurses also need to coordinate with the team of professionals (interdisciplinary team) to achieve the goals (Al-Jahdali et al., 2013; Barolia, 2008; Choong, 2015; Labson et al., 2013) (Figure1).

According to Hagan et al. (2018), the roles of nurses in providing palliative nursing care include symptom/pain management, good communication, and advocacy to patients and families. Also, it is necessary to increase the spiritual aspect of the patients, which includes four aspects (Irajpour et al., 2018), including: (1) aspects of religiosity - religious rituals, religious values, and religious practices, (2) aspects of religious assistance - consultation about the meaning of life/death, help to achieve intellectual tendencies, improve communication with oneself and others, (3) aspects of psychology - instill calm in the patient, help patients to adapt, foster hope and enthusiasm, and empathy, and (4) supportive aspects - maintain the patient's basic needs, homecare, create awareness and self-acceptance, and respect the patient.



**Figure 1** The relation of bio-psycho-socio-spiritual and nursing practice for palliative care adapted from Al-Jahdali et al. (2013); Barolia (2008); Choong (2015); Labson et al. (2013)

## Illness in the Perspective of Islam

Muslims must believe that all trials in life, including illness, are the tests for humans. Allah SWT has said in the Holy Qur'an (29:2), "Do people think that they will be let go merely by saying: 'We believe, and that they will not be tested?'. The verse explains that everything that happens

in life is a test for humans, including illness. Muslims firmly believe that humans will meet illness and death (must be patient and pray); thus, maintain respect for each other is essential while avoiding haram food (Rassool, 2015).

Allah promises that the test to be faced will be according to His servant's ability. Allah says in the Holy Qur'an (2:286) that Allah does not lay responsibility on

anyone beyond his/her capacity. Besides, humans must be patient in dealing with illness (as a part of the tests). Believers, be steadfast, and vie in steadfastness, stand firm in their faith, and hold Allah in fear that they may attain real success, described in the Holy Qur'an (3:200).

In addition, the interpretation of the [Ministry of Religion of the Republic of Indonesia \(1995\)](#) states that patience is carried out in various conditions, such as patience in carrying out God's commands and prohibitions, struggling, and facing all kinds of trials and calamities. When facing a critical situation or experiencing difficulties, the patient's welfare and care must be improved; friends and relatives are encouraged to visit. This is done as a tribute to the patient to provide comfort ([Choong, 2015](#)).

Besides, it is also a way to remind of spirituality. If there is a spiritual problem, it will cause disturbances in various aspects of the patient's life ([Stacey, 2018](#)). Therefore, we must realize and believe that whatever happens in this life is the provision of Allah. It is written in the Holy Qur'an (6:59), *"He has the keys to the realm that lies beyond the reach of human perception; none knows them but Him. And He knows what is on the land and in the sea. There is no leaf which falls that He does not know about, and there is no grain in the darkness of the earth or anything green or dry which has not been recorded in a Clear Book (Lohmahfuz)"*.

## A Death in Islam

In the Holy Qur'an (29:57), it is stated that every soul will die, then to Us, you will all be returned. Since the beginning, Muslims have been invited to realize that one day they will die. The hope is that every Muslim will be ready to die in peace and draw closer to Allah. All Muslims should always expect Allah's forgiveness and mercy ([Al-Shahri & Al-Khenaizan, 2005](#)). Islam views death not as the end of life but, afterward, humans will be raised again in another life (or hereafter) ([Asadi-Lari et al., 2008](#)).

To achieve readiness in facing death, patients need to get comfort from nursing care services to reduce anxiety and depression ([Nuraini et al., 2018](#)). Allah SWT has confirmed in the Holy Qur'an (13:28), *"Those who believe and whose hearts find comfort in the remembrance of Allah; surely, do hearts find comfort."*

Believers will have a peaceful heart because they always remember Allah. There will be no anxiety and fear or worry because people who always remember Allah will continue to do good things, and they will feel happy with the goodness they do ([Goffar, 2004](#)).

When a person's condition gets worse, and he/she fears that he/she will die, several things need to be done as follows.

- Having good prejudice to Allah. *"And when he is nearing his death, let him have a good prejudice to Allah."* It is based on the Hadith of Jabir and Anas: *"He heard the Prophet say before his death: Do not all of you die, except having good prejudice*

*(Huznudzan) to Allah."* This is explained in the Hadith of Sahih Muslim (2877).

- Leaving a will before death. If a person is seriously ill or feels that death is coming, Islam leads to leaving a will with the living. This is based on the word of Allah in the Holy Qur'an (2:180), *"It is prescribed that when death approaches any of you—if they leave something of value—a will should be made in favor of parents and immediate family with fairness. This is an obligation on those who are mindful of Allah."*
- *Talqin* (leading to pronounce). Unlike the general practice, the Muhammadiyah Tarjih Council determines the *talqin* as in the decision; *"You should guide him to say to the person who is going to die by saying the sentence La-ila-ha illallah (There is no God but Allah)." It is based on the Hadith of Abu Sa'id: "From the Prophet SAW, he said: Guide to say to those who will die by saying La-ila-ha illallah."* This is explained in the Hadith of Sahih Muslim (916).
- Facing the Qibla. It is according to the Hadith of Abu Qatada. When Bara' bin Ma'rur had a will to come to Kaaba and face the Qibla, the Prophet SAW said, *"He matches his fitra (original disposition)."*

## Early Actions on the Dead

After a severe illness that cannot be helped and then dies, several things need to be done immediately by the relatives and people who are still alive. Those include:

- Closing their eyes and praying for them. This is explained in the Hadith of Ummi Salamah, *"Rasulullah Peace Be Upon Him (PUBH) came to Abi Salamah (when he died) and his eyes were open, so he closed them."* Then the Prophet PUBH said, *"Certainly the spirit, if released, is followed by the eye."* He also said to the people, *"Do not pray for yourself, except for good, because actually, the angel agrees with what you say."* Then he said again, *"O Allah, forgive Abu Salamah, uphold his rank as high as the degree of those who are righteous, open it and give change after he dies."* This is explained in the Hadith of Sahih Muslim (1524).
- Covering them with good cloth. This is described in the Hadith of Aisyah RA, *"That when Rasulullah PUBH died, he was devoured with a hibrarah cloth (a type of patterned Yemeni cloth)."*
- Paying off their debt. One of the things that need to be done when someone dies is to pay off the debt concerned immediately. This is based on the Hadith of Abu Hurairah, in which the Prophet PUBH said, *"The life of a Mu'min depends on his debt until he is repaid."*
- Taking care of the body. After someone is declared to be dead, the body must be treated immediately. This is based on the Hadith of Ali, in which Rasulullah PUBH said, *"Three cases, O Ali, must not be postponed, including prayer when the time comes,*



the body when it is clearly said to be dead, and a woman who does not have a husband if she finds her soul mate" (Al-Albani, 2014).

- Spreading the death news. When someone dies, the next action is to immediately spread the word to relatives, friends, and Muslims. This is based on the Hadith of Bukhari Muslim, in which Rasulullah PUEB was told about the man who swept the mosque died and buried that night. He said, "Don't you want to tell me?"

## Discussion

Generally, the nurse's treatment in providing care covers several aspects: giving their respects to the patient, being ready, being realistic, having empathy and care, sensitivity, empowering the patients, and discipline (Ciemins et al., 2015). The applications of Islamic values in the nursing practice include: (1) nursing care performed by professional nurses with good skills and behavior in taking care of dying patients (Muishout et al., 2018), (2) providing opportunities for patients to rest and gather with the family, (3) reminding about the greatness of Allah (God), happiness, and good rewards, (4) giving the patient religious therapy by reciting the Holy Qur'an, (5) discussing the hope towards Allah (God), (6) encouraging the patient to pray, (7) encouraging them to have a good deed and worship, (8) giving them a chance to deliver the last hope of the patients (relation between nurse and patient) (Haugan, 2014), (9) actions before death - reminding patients that an illness is not a punishment from Allah and should be faced as a test, doing *thahara* for Muslim who cannot do the ablution (according to Islamic law, it is the act of purifying oneself from ritual uncleanness or even impurity or *najis* until someone fulfills the requirements to perform certain actions to worship Allah). If there is no possibility of living, the medical team may do Do Not Resuscitate (DNR). Suicide is not the way the Muslims die; it is not allowed. Giving additional nutrition could be done as long as it is good and not harming the patient (explained in the Holy Qur'an 2:168). Lead the patients to recite *Laa-ilaaha illallah* during their dying situation, and (10) actions after the death, such as closing patients' eyes and covering the corpse with the shroud. Grieving or mourning for a long time is not allowed; organ donation may be possible with family permission and an agreement not to be traded (Shuriye, 2011). Also, the cremation of the corpse is not allowed (Leong et al., 2016).

Given the importance of the Islamic values in nursing practice, there are challenges in its application, such as the policy and system that may not support the integration of Islamic values to nursing practice. The policy most likely focuses on reducing the pain or other symptoms, reflecting a low spiritual aspect in nursing practice. In addition, there are still limited guidelines for the provision of spiritual care. Besides, although the concept of Islam in palliative care is not new among Muslim nurses; however, they may not perform it well. Palliative care requires high competence of

nurses, especially in cultural competence and communication. Islam is often viewed at different levels of understanding and practice; thus, the communication skills of nurses should be improved for better care. Training in palliative care among nurses should be conducted regularly.

## Conclusion

Islamic value provides a comprehensive approach in palliative care. Nurses are expected to apply this value in their practice to serve the patient as a whole person, rather than just someone with a health condition. It is also hoped that the health policymakers pay attention to the roles of Islamic values and integrate them in nursing practice, especially in palliative nursing care.

### Declaration of Conflicting Interest

The authors declare that there is no conflict of interest.

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### Author Contribution

ES conceptualized, analyzed, and drafted the manuscript. IS critically reviewed and discussed the manuscript. All authors agreed with the final version of the article.

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# Nursing ethics education in Brunei Darussalam – Where are we today?

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In the recent years, Brunei Darussalam had witnessed a greater interest in setting out ethical guidelines and best practices, particularly when several professional documents such as the Code of Ethics for nurses were issued by the [Nursing Board for Brunei \(2010\)](#). This critical milestone of the Code suggested changes in the way the ethical dimension is perceived in nursing practice. A study on the ethical dimension of nursing practice indicates that Bruneian nurses are not entirely certain of the extent of their professional nursing ethical responsibility ([Zolkefli, 2019](#)). At the same time, the health authority urges nurses to assume more accountability and practise good patient care. However, this is only possible if nurses understand and appreciate the moral aspect of the profession.

Amongst the earlier questions regarding revising the teaching and learning of nursing ethics is the issue of course content. Previously, the main subjects were related to bioethics – for example, brain death and organ transplantation – and such emphasis addressed only partial concepts in nursing ethics that were inadequate for preparing students to assess moral issues in nursing practice. Another challenge is related to making ethical judgements. Arguably, ethical judgements were least prioritised in Brunei, and this is evident in the fact that too much importance was attached to helping students make technical or clinical judgements. Instead of ethics, it was professional etiquette that received the most attention – though this has changed a lot in the past decade. Another issue is the fragmentation and gaps of courses related to the application of classroom learning in the clinical context. To ensure continuity in ethics learning, it was proposed that the nursing curriculum should include a language of ethics that would be employed during classroom and clinical training through activities such as the debate on ethics among students, nursing mentors and clinical teachers. It was also assumed that ongoing ethics conversations might help students become more ethically sensitive.

In response to the identified gaps, in 2009, a more comprehensive and realistic nursing ethics course was developed, refined and introduced in the undergraduate nursing programme. 'Law and Ethics for Health Professionals' is a course offered to students in both nursing and midwifery and holds two flexible credits, including 14 weeks of teaching and learning. The course is designed to introduce an ethical dimension to nursing practice, and the expectation is that students will reflect on their personal and professional values in different ethical concerns. This course primarily includes educational components in which students learn concepts unique to nursing ethics such as confidentiality and truth-telling. Several years later, in 2016, class debates were employed to reinforce both students' critical thinking skills by analysing ethical issues and, most importantly, their active participation. Students' active participation in the teaching of ethics is an essential contributor to the promotion of the active learning process ([Self & Baldwin Jr, 1994](#)). The results have reinforced contemporary thought that adult learners do better with less guidance and more engagement. They revealed contrasting experiences in conventional classes for the nursing students and those in the modern form of teaching.

Meanwhile, a 'legal café' learning style has been introduced recently, where students are divided into several groups and are expected to review and provide a PowerPoint presentation of pre-assigned landmark cases – such as Bolam, Bolitho and Canterbury – in a more laid-back learning style. Not only did students thoroughly enjoy the sessions, but it also proved to be useful in making them cognizant of the legal considerations and how ethical values are reflected in such cases. This exercise also highlighted critical legal–ethical relationships. It is worth noting that there is already a proposal to strengthen further the legal components by inviting legal officers from the Attorney General Chambers (implemented within the

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context of postgraduate ethics) and even attending an actual court hearing.

All the essential elements of nursing ethics education were also covered within the course, including the use of professional documents, as mentioned earlier, which serve as national ethical standards and values. They set the expected conduct for the nursing and midwifery professions. This is particularly significant where elements of the Malay Islamic Monarchy's national philosophy are upheld and integrated into the documents, which teach Islamic values. Because of the globalisation of nursing education, Western ideals are being incorporated in the nursing curricula (Harding, 2013). Ethical values, such as informed consent are primarily based on Western theory, which focuses on individualist principles. The concept of individualism is prevalent in Western countries (Brougham & Haar, 2013), while the concept of collectivism reflects Bruneian culture. In response to this, the application of ethical theories based mainly on Western principles is adapted and modified following the values and traditions of the country. For example, there are several groups of people who strongly believe in God, whereby they trust and confidence in Allah (Twakkul) as a true treatment (Ibn Qayyim Al-Jawziyya, 1978). This can potentially prove challenging for health professionals to maintain the principle of respecting the autonomy of the patient when they decline to expose themselves to any physical treatment.

Above all, it seems pertinent to remember that teaching ethics is about raising ethical expectation and standard in the nursing profession. Current approaches to nursing ethics education may lead to possibilities of new, modern and creative educational methods. Still, they require further unorthodox pedagogy if they are to bridging any existing educational gaps and meeting nursing education standards at all levels. This may include, for example, the use of artistic teaching strategies such as drama or therapeutic letter writing. In a nutshell, there is no doubt that professional engagement and a deep sense of duty from teachers' are essential. Still, classroom interventions alone can have only a partial effect in maintaining a robust ethical dialogue. Simultaneously, the current course on

nursing ethics must include an ongoing discussion on ethics in clinical settings. Such visibility and emphasis on nursing ethics are highly welcomed and embraced in the profession of nursing.

#### Keywords

ethics; nursing; Brunei Darussalam; education; bioethics; informed consent; confidentiality

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# Diploma in Nursing or Bachelor of Science in Nursing: Contradictory issues among nurses in Bangladesh

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The importance of nursing has been seen in the COVID-19 epidemic situation worldwide (Gunawan et al., 2020). This letter prompts discussion about contradictory issues among nurses in Bangladesh.

Firstly, in our country, since 2008, the Diploma in Nursing Science and Midwifery course has been upgraded, and the Bachelor of Science in Nursing degree has just been started (Bangladesh Nursing and Midwifery Council, 2018). Nursing has been considered a second-class job since 2011 (Ministry of Health and Family, 2011). However, there is a disparity between diploma and graduate nurses in Bangladesh. Diploma nurses have more priority than graduate nurses. Diploma nurses have 90% of the seats allocated for government jobs. On the other hand, graduate nurses are allocated only 10% of seats despite being more qualified (Bangladesh Public Service Commission, 2020). This inequality is a contemporary issue in Bangladesh. That is why undergraduate nurses in Bangladesh have an uncertain future. New meritorious students are also confused about these courses. Where should they be admitted? Diploma in Nursing or Bachelor of Science in Nursing?

Secondly, most nursing students graduated from private institutions every year. The ratio of nurses graduating from private and government institutions is 25: 8 (Bangladesh Nursing and Midwifery Council, 2020). There are approximately 71,369 registered nurses in Bangladesh (Bangladesh Nursing and Midwifery Council, 2020) and 14,686 nurses working in government (Ministry of Health and Family Welfare, 2020a). Although more than 70% of nurses work in the private sector, those who work in the private sector face limited seats in higher education than government-employed nurses. Only 3% of the total seats allocated in the Master of Science in Nursing (MSN) program are for privately employed nurses (Bangabandhu Sheikh Mujib Medical University, 2020). New graduate

nurses are being deprived of their careers because of these limited opportunities.

Thirdly, there are inequalities for graduate nurses and graduates from other departments. Graduate nurses are considered a second-class profession, but graduates of other departments are considered a first-class profession. So, nurses are feeling dissatisfied working for this less value (Morsheda et al., 2016). Bangladesh bears 76 percent of the deficit of nurses. The country needs another three lakh nurses (Siddiqui, 2020). According to the World Health Organization (WHO), at least three nurses must be hired against a physician (Imam, 2020). But there are 2.85 times more doctors than nurses in our country (Alam, 2019).

Fourthly, in Bangladesh, nurses join as senior staff nurses and retire in the same position due to lack of promotion (Ministry of Health and Family Welfare, 2020b). Only senior staff nurse posts are available in Bangladesh, and some nurses are promoted to the position of Nursing Supervisor, Matron, Nursing Instructor. However, this process takes a long year of works.

Fifthly, if nurses with a diploma course join the job before a postgraduate degree nurse, they will be promoted with experience without educational qualifications. The first joining nurse gets them promotion first whether they qualify or not; the only experience is evaluated. Academic qualifications are not considered. However, qualified nurses are needed to establish a nurse-patient interpersonal relationship.

In conclusion, nurses are central to the health care setting. We need to welcome qualified nurses to improve the nurse-patient interpersonal relationship and provide equal facilities to higher education for those who are qualified. Otherwise, nurses will not be interested in pursuing higher education. Thus, every job field needs to provide equal opportunities for graduate nurses. Not only

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that, but a new post needs to be created for graduate nurses, educational qualifications also need to be considered for promotion to ensure the quality of care. The honor should also be given to the graduating nurses as first-class employees like other graduate departments in Bangladesh. It is because the satisfaction of nurses' work has a positive relationship with patient outcomes and satisfaction. Otherwise, the quality of care will never be improved.

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