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Research article

Salutogenesis and COVID-19 pandemic impacting nursing education across SEANERN affiliated universities: A multi-national study

Shefaly Shorey\textsuperscript{a}, Emily Ang\textsuperscript{a}, Ns. Syamikar Baridwan\textsuperscript{b}, Sheila R. Bonito\textsuperscript{c}, Luz Barbara P. Dones\textsuperscript{d}, Jo Leah A. Flores\textsuperscript{c}, Rachel Freedman-Doan\textsuperscript{d}, Hiroki Fukahori\textsuperscript{f}, Kayo Hirooka\textsuperscript{g}, Viry Koy\textsuperscript{h}, Wan Ling Lee\textsuperscript{j}, Chia-Chin Lin\textsuperscript{k, l1}, Tzu Tsun Luk\textsuperscript{k, l2}, Apiradee Nantsupawat\textsuperscript{d}, Anh T.H. Nguyen\textsuperscript{m}, Mohd Said Nurumal\textsuperscript{n}, Souksavanh Phanpaseuth\textsuperscript{o}, Agus Setiawan\textsuperscript{b}, Takuma Shibuki\textsuperscript{p}, Thandar Soe Sumaiyah Jamaluddin\textsuperscript{q}, Huy TO\textsuperscript{r, s}, Srey kepov Tun\textsuperscript{l}, Ns. Dwi Nurviyandari Kusuma Wati\textsuperscript{b}, Xinyi Xu\textsuperscript{k, 2}, Wipada Kunaviktikul\textsuperscript{d, e, *}

\textsuperscript{a} Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, Level 2, Clinical Research Centre, Block MD11, 10 Medical Drive, Singapore 117597
\textsuperscript{b} Department of Community Health Nursing, Faculty of Nursing, Universitas Indonesia, Indonesia
\textsuperscript{c} College of Nursing, University of the Philippines Manila, Philippines
\textsuperscript{d} Faculty of Nursing, Chiang Mai University, Thailand
\textsuperscript{e} Panyapiwat Institute of Management, Thailand
\textsuperscript{f} Faculty of Nursing and Medical Care, Keio University, Japan
\textsuperscript{g} Graduate School of Health Management, Keio University, Japan
\textsuperscript{h} Faculty of Nursing, Chulalongkorn University, Thailand
\textsuperscript{i} Department of Hospital Services, Ministry of Health, Phnom Penh, Cambodia
\textsuperscript{j} Department of Nursing Sciences, Faculty of Medicine, University of Malaya, Malaysia
\textsuperscript{k} Li Ka Shing Faculty of Medicine, The University of Hong Kong, Pok Fu Lam, Hong Kong
\textsuperscript{l1} Alice Ho Miu Ling Nethersole Charity Foundation, Hong Kong
\textsuperscript{l2} School of Nursing, Phenikaa University, Vietnam
\textsuperscript{m} Department of Critical Care Nursing, Kulliyyah of Nursing, International Islamic University Malaysia, Malaysia
\textsuperscript{n} Faculty of Nursing Sciences, Laos
\textsuperscript{o} Keio University School of Medicine, Department of Preventive Medicine and Public Health, Japan
\textsuperscript{p} Department of Medical-Surgical Nursing, Kulliyyah of Nursing, International Islamic University Malaysia, Malaysia
\textsuperscript{q} Vietnam Nurses Association, Vietnam
\textsuperscript{r} Thang Long University, Vietnam
\textsuperscript{s} Faculty of Nursing and Midwifery, Puthisastra University, Cambodia

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ABSTRACT

Background: The COVID-19 pandemic has disrupted the lives of many. Particularly, nursing students experience greater stress as their normal curriculum is interrupted and some of them face the risk of being infected as frontline workers. Nursing faculty members may face similar struggles, in addition to developing teaching materials for online learning. Thus, it is important to examine the faculty members' and students' views on their ability to adapt during the pandemic to obtain a holistic view of how learning and training has been affected.

Design: The descriptive cross-sectional quantitative design was used.

Setting: Data were collected from Southeast and East Asian Nursing Education and Research Network (SEANERN) affiliated nursing institutions from January 2021 to August 2021.

Participants: A total of 1897 nursing students and 395 faculty members from SEANERN-affiliated nursing institutions in Cambodia, Hong Kong, Indonesia, Japan, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam were recruited for this study.

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1. Introduction

The emergence of the COVID-19 pandemic triggered nations around the world to respond in largely unprecedented ways. Measures taken to combat the virus have disrupted the daily lives of many (Qiu et al., 2020; O’Sullivan et al., 2020). This pandemic can be described as a significant and life-changing experience. It represents both a direct and an indirect threat to health, and may have long-term implications at both local and global levels (Qiu et al., 2020).

Specifically, nursing students have reported feeling more stressed during such crises, as the remote learning arrangements have compromised their learning (Aslan and Pekince, 2020). Faculty members may equally feel overwhelmed as they are responsible for providing education, and their experience warrants investigation. Therefore, the study aims to examine the impact of COVID-19 on psychosocial well-being and ability to adapt to broad-based teaching and learning among Southeast and East Asian nursing students and faculty members. This would contribute to an in-depth understanding on how the pandemic has impacted the education and well-being of nursing students and faculty members.

2. Background

The novel coronavirus (COVID-19) was declared as a global pandemic (WHO, 2020a), affecting millions of people worldwide. Research on global crises like the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003 have found significant increases in stress and anxiety experienced by healthcare students and workers (Landis and Bradley, 2005). It is possible that the same groups of people are experiencing similar levels of distress during the COVID-19 pandemic.

2.1. Salutogenesis and COVID-19

Salutogenesis focuses on studying the origins and experience of health, rather than the origins of disease (Mittelmark and Bauer, 2017). The theory was introduced by medical sociologist Aaron Antonovsky (1979) as a stress and coping model, which proposes that life experiences help to shape one’s sense of coherence (SoC) – the core construct of salutogenesis. It consists of three components – comprehensibility, manageability and meaningfulness (Antonovsky, 1979). Comprehensibility means having a good understanding of the challenge faced, as one cannot manage a stressor unless they know what it is about. Manageability is the sense that the resources needed to deal with a stressor is in one’s own hands. The last component, meaningfulness, refers to looking at life as if it is worth living. The SoC helps an individual to mobilize resources that aid them in managing stressors (Mittelmark and Bauer, 2017). A strong SoC is associated with pro-health behaviors, reduced negative impact from stressors and lower post-traumatic stress disorder (PTSD) symptom severity (Szovák et al., 2020; Schäfer et al., 2019). Individuals with strong SoC can understand and manage their internal and external environments better, helping them cope with stress efficiently (Szovák et al., 2020). Studying profound challenges like pandemics through salutogenic lenses can provide opportunities for understanding how individuals cope during crises and suggest methods to improve the health of the overall population (Mana et al., 2021). A recent study has demonstrated the importance of examining SoC, especially during a pandemic, due to its role in predicting mental and physical health (Mana et al., 2021). Therefore, it would be beneficial to assess the SoC of healthcare personnel, especially nursing students and nursing faculty members.

2.2. Nursing education in SEANERN countries

Despite some differences in nursing education systems across the SEANERN countries, the nursing course to obtain registered nurse licensure is usually three years, comprising of both academic and clinical components across these countries (Efendi et al., 2018). In each country, the nursing course curriculum is guided by the country-specific professional boards. In Hong Kong, Cambodia, Philippines, and Thailand, only university degrees in nursing are offered, whereas in Singapore, Malaysia, Laos, and Indonesia, both nursing diploma and degree courses are being offered. In addition to university degrees, Japan offers a three-year nursing junior college or training school alternative, whereas Vietnam offers an alternate two-year secondary nursing education, and three-year college nursing education. The differences in diploma and degree courses are the entry-level requirements where university degree requires completion of college (12 years of elementary education), and diploma requires completion of high school (10 years of elementary education) before getting enrolled in the respective nursing courses. The diploma and degree courses also differ in the depth of topics being offered and the students from diploma and degree courses start at different nursing ranks post-graduation. For this study, we only focus on university-affiliated nursing students and the nursing faculty across SEANERN countries. Likewise, nursing licensing examinations (NLE) vary across the SEANERN countries in terms of the language used in the exam, exam characteristics, and exam requirements. Almost all the countries administer the NLE in multiple-choice question format (MCQ), but in Myanmar the examination has both verbal and written components (Efendi et al., 2018), whereas Singapore does not have NLE for locally trained nurses. In Singapore, locally trained nurses are required to complete and pass a rigorous end-of-the-course clinical training program where they are required to showcase independence and critical thinking. They are then assessed by clinical stakeholders against criteria stipulated by the Singapore Nursing Board.

2.3. Nursing students and COVID-19 pandemic

Before COVID-19, like most countries globally, in-person lessons and in-hospital clinical placements were the norms. On-the-job training is a valuable learning opportunity for nursing students, as they are best able to practice and acquire the essential nursing skills and attain confidence.
in their role as a nurse during this time (Hartigan-Rogers et al., 2007). Due to COVID-19, schools were closed and students had to be educated on online platforms (Aslan and Pekince, 2020). However, not all students have seamless access to online platforms. Some experienced problems such as electricity and connectivity issues that reduced the quality of their learning (Tadesse and Muluye, 2020; Subedi et al., 2020). This could have further intensified the students’ worries about their academic future.

A recent review examining the experiences and needs of nursing students during pandemic outbreaks revealed feelings or fear, anxiety, and unpreparedness among nursing students (Goni-Fuste et al., 2021). In Belgium, clinical placements were affected, and students felt that they were insufficiently supervised by their preceptors due to the shortage of frontline workers (Ulenaers et al., 2020). In Canada, some students also experienced their placements being cancelled or delayed due to safety concerns (Dewart et al., 2020), which could have affected their confidence in their nursing competency and contributed to their anxiety. A recent study in Turkey has shown that exposing nursing students to long term stressors can exert negative impacts on their professional identity development (Aslan and Pekince, 2020). However, current research on nursing students and COVID-19 are mostly concentrated in high-income and Western countries (Goni-Fuste et al., 2021), hence, more research is warranted to understand the experiences of Southeast and Asian nursing students which would allow for the development of resources to help them cope better.

2.4. Nursing faculty members and COVID-19 pandemic

In an international study conducted across 30 countries to examine the difficulties faced by nursing educators during the COVID-19 pandemic, 81% of nursing educators reported transitioning to online classes from home (Kalanlar, 2022). However, 48% encountered Internet-related problems, 44% reported difficulty in adapting the curriculum to distance education and 65% had issues providing exams to students (Kalanlar, 2022). In reaction to the COVID-19 measures implemented, nursing staff members in Canada were required to make the necessary preparation for remote learning by working longer hours to transition existing curriculum to suit remote teaching (VanLeeuwen et al., 2021). The pandemic might have also affected their research projects. A few studies from Canada and Kosovo found that faculty members often felt overwhelmed by work (VanLeeuwen et al., 2021) and faced stress and uncertainty due to the lack of prior experience in conducting E-learning (Duraku and Hoxha, 2020). The stress and anxiety arising from the changes caused by the COVID-19 pandemic might affect their mental health. However, existing literature centering on the experiences and psychosocial well-being of faculty members during the COVID-19 pandemic is rather limited. As faculty members are crucial in determining the quality of education received by nurses, it is important to understand their perspectives to provide necessary support to help them manage their difficulties and enhance the overall healthcare setting. Thus, the present study hopes to answer the questions on how COVID-19 has affected the nursing education and the psychosocial well-being of the nursing students and faculty members.

3. Methods

3.1. Aim

This study aims to evaluate the impact of the COVID-19 pandemic on nursing students’ and faculty members’ psychosocial well-being as measured by: their satisfaction with new learning or teaching modalities, confidence levels, psychosocial well-being, sense of coherence and stress experienced.

3.2. Design

This present study used a descriptive quantitative cross-sectional design.

3.3. Participants

The participants of this study were undergraduate nursing students and faculty members from Southeast and East Asian Nursing Education and Research Network (SEANERN) affiliated nursing institutions (Table 1). The SEANERN is an international forum established in 2015 to exchange knowledge about concepts on nursing education and research to enhance teaching and research quality across the region. Participants have to be 18/21 (country-specific legal age) years or older and must be willing to participate in the study.

3.4. Sample size calculation

A similar published study among primary health care providers across SEANERN countries (Du et al., 2019) guided the sample size calculation for this study. The previous study (Du et al., 2019) recruited and limited the sample size to 80 individuals per country, which was highlighted as a limitation of the study. To fill the gap and to establish standardization and enhance generalizability across data collection sites, each institution was encouraged to recruit a convenience sample ranging from 80 to 150 nursing students based on logistic feasibility. For faculty members, due to the varied number of employees across different institutions, convenience sampling was also used to recruit as many faculty members based on their voluntary participation.

3.5. Outcome measures

The following instruments were used to collect data, and permission was sought from the copyright holders before using the instruments. Most of the countries collected data in English. However, for those countries where data were collected in native languages the instruments were translated by the bilingual native speakers. The English instruments were translated to their native language before being back translated to English by another bilingual faculty member, and a third

| Country       | Participating institutions                                      | Translated questionnaires | Participants (n) |
|---------------|----------------------------------------------------------------|--------------------------|-----------------|
| Cambodia      | University of Health Sciences                                  | Yes                      | 29              | 283             |
| Hong Kong     | University of Puthisastra                                        | No                       | 28              | 114             |
| Indonesia     | University of Indonesia                                      | Yes                      | 36              | 150             |
| Japan         | Keio University                                                | Yes                      | 28              | 165             |
| Laos          | University of Health Sciences                                  | Yes                      | 31              | 129             |
| Malaysia      | International Islamic University Malaysia                       | No                       | 65              | 161             |
| Philippines   | University of the Philippines                                  | No                       | 14              | 50              |
| Singapore     | National University of Singapore                               | No                       | 15              | 150             |
| Thailand      | Chiang Mai University                                          | Yes                      | 133             | 548             |
| Vietnam       | Vietnam Nurses Association                                     | Yes                      | 16              | 147             |
independent reviewer in the respective countries reviewed the original and translated instruments. The final translated instruments were content validated by the country-specific experts (not part of the research team), and content validated index (CVI) was calculated. The CVI was above 0.8 for each instrument, including those which were used for the first time in the specific country. No changes were made to any item on the instruments across the countries. The Cronbach’s alphas of the instruments can be found in Table 2.

a. Demographic data (i.e. age and gender) were collected from the participants. Nursing students and faculty members were also asked to indicate their satisfaction with the newly implemented learning/teaching modalities on a six-point Likert scale.

b. Grundy’s (1993) Confidence Scale (C-scale) is a five-item instrument measuring the participants’ confidence level concerning their nursing education and clinical skills on a five-point scale (e.g. ‘I feel satisfied with my performance’). Scores are obtained by summing up the items, where higher scores indicate greater confidence. The scale has previously shown good reliability and validity (Liu et al., 2019). Only nursing students completed the C-scale.

c. The Knowledge and Attitude during COVID-19 outbreak (KAQ) questionnaire measured the nursing students’ and faculty members’ thoughts and feelings during the COVID-19 pandemic. It consists of the seven-item Generalized Anxiety Disorder (KAQ-GAD) scale (Spitzer et al., 2006); the 14-item Mental health continuum (KAQ-MHC) scale (Lamers et al., 2011); and 33-items derived from Landis and Bradley’s personal impact scale (2005) assessing COVID-19’s impact on the participants. The KAQ-GAD enquired about the participants’ troubles over the last two weeks (e.g. ‘trouble relaxing’, ‘becoming easily annoyed or irritable’), while the KAQ-MHC measured the participants’ feelings (e.g. ‘happy’, ‘interested in life’) over the past month. Content validation on the personal impact portion of the KAQ was done in each country by the respective experts. Responses for the KAQ-GAD and KAQ-MHC were summed to obtain two respective scores. Higher scores on the KAQ-GAD indicate greater levels of anxiety, and higher scores on the KAQ-MHC indicates better mental well-being.

d. The Sense of Coherence (SoC) Scale (Antonovsky, 1993) is a 13-item questionnaire that has been used in at least 33 languages (Eriksson and Lindstrom, 2005). A total score is obtained by summing up the item responses. A high total score indicates higher SoC, reflecting an individual’s confidence in both the predictability of their internal and external environment, and their ability to cope with stress. The SoC questionnaire was administered to both all participants.

e. The Stanford Acute Stress Reaction Questionnaire (SASRQ) consists of 30 items measuring acute stress levels, such as ‘I felt restless’ and ‘I had difficulty concentrating’ (Cardena et al., 2000). Both the nursing students and faculty members completed this questionnaire. Each item ranges from zero to five, with the total score ranging from 0 to 150. The SASRQ is commonly used as a measurement for acute stress disorder (ASD), and scores above 40 suggests a high risk for ASD (Zhang et al., 2021).

3.6. Data collection

Upon obtaining the country-specific ethics approval, the SEANERN representatives sought permission from their relevant university authorities before approaching the nursing students and faculty members. A mass email with the study procedures, questionnaire links and the participant information sheet (PIS) were sent to the students and faculty members. The email provided abstract of the project with a questionnaire link. Upon accessing the link, participants were shown the project summary on the landing page and were encouraged to read the PIS. Voluntary participation was reinforced, and participants were clearly informed that their decision of not participating in the study will not affect them in any way. They were then asked if they agree to participate and indicated their consent by clicking on the corresponding box before they could move on to the following sections with the questionnaires. The participants’ demographic data such as age, gender and whether they were satisfied with the new learning/teaching modalities were collected together with their responses to the self-reported questionnaires.

3.7. Ethical considerations

Each country had obtained the ethics approval from their respective country specific ethics review boards. As the National University of Singapore was the main host institute for this project the ethics approval number from the review board is as follows: NUS-IRB-2020-436.

3.8. Data analysis

The IBM SPSS Statistics for Windows Version 27.0 (IBM Corp., Armonk, NY) was used to analyse the data. Descriptive statistics were used to summarize the socio-demographic information of participants and the levels of outcome variables. One-way analysis of variance (ANOVA) was conducted to analyse the differences in levels of all outcome variables across the countries. Pearson’s product-moment correlation coefficient was used to examine the relationships among the outcome variables. For results to be considered statistically significant, the p-values were set at below 0.05. After assessing the pattern of missing responses using the MCAR test, the last observation carried forward (LOCF) imputation method was used to replace missing data.

4. Results

Data collection took place from January 2021 to August 2021. Total 1897 nursing students and 395 faculty members were recruited from 13 institutions. The mean age of the nursing students in this study was 21.7 years (SD = 3.78), and that of faculty members was 41.1 years (SD = 9.99). The response rate from each country and total number of participants are presented in Supplementary Table 1 and Table 1 respectively. Table 3 indicates the demographic characteristics of the participants. Majority of the students and faculty members recruited were females. Participants were also asked to indicate their satisfaction towards the new teaching/learning modalities.

4.1. Satisfaction with new learning/teaching modalities

Most of the nursing students were satisfied with the new learning modalities (n = 951, 50.3%), although there was a substantial proportion who were dissatisfied (n = 260, 21.5%). Similarly, majority of the nursing faculty members were at least slightly satisfied with the new teaching modalities (n = 219, 55.9%) (Supplementary Table 2).

4.2. Nursing students’ confidence in knowledge and clinical skills

To understand whether nursing students were confident in their knowledge and clinical skills, confidence scores were computed from

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**Table 2**

| Instrument                                      | Cronbach's alpha |
|-------------------------------------------------|------------------|
| Sense of Coherence scale                        | 0.77             |
| Confidence scale                                | 0.90             |
| Stanford Acute Stress Reaction Questionnaire    | 0.96             |
| Knowledge and Attitude during COVID-19 outbreak (KAQ) components: | 0.93 |
| Generalized Anxiety Disorder                    |                   |
| Mental Health Continuum Scale                   | 0.87             |
their responses on the C-scale (Supplementary Table 3). The least significant difference (LSD) test revealed that Laotian nursing students scored significantly higher on the C-scale than students from other countries (Table 4). However, Japanese students had significantly lower confidence levels ($M = 10.42, SD = 3.46$). The students' satisfaction with new learning modalities was positively correlated with their scores on the C-scale ($r (1169) = 0.168, p < 0.05$). Inconsistencies in the $n$ values can be attributed to incomplete responses.

4.3. Knowledge and attitudes towards nursing education

Responses on the KAQ were examined to obtain an in-depth understanding of the nursing students' psychosocial experiences during the pandemic. The students' responses on the KAQ-MHC ($M = 56.98, SD = 14.07$) and KAQ-GAD ($M = 6.10, SD = 4.99$) assess mental well-being (Supplementary Table 3). An overwhelming majority of the students had fears of contracting COVID-19 ($n = 946, 85.3\%$) and passing it to their family members ($n = 952, 95.8\%$) (Supplementary Table 4). However, most of them felt well-supported by their peers ($n = 901, 81.3\%$) and facilitators ($n = 822, 74.1\%$). Due to the measures implemented to contain the virus, the nursing students had restricted access to some parts of the hospitals and patients. Most of them felt that their learning needs were affected ($n = 919, 82.8\%$), and had difficulties concentrating on their studies ($n = 792, 71.4\%$).

Overall, the faculty members' mean KAQ-MHC and KAQ-GAD scores were 64.73 ($SD = 13.65$) and 4.98 ($SD = 4.22$) respectively (Supplementary Table 5). Majority of the faculty members fear that they would contract the coronavirus ($n = 174, 75.7\%$) and pass it to their family members ($n = 187, 81.0\%$) (Supplementary Table 6). Most faculty members also felt that they suffered academically ($n = 108, 46.8\%$) and clinically ($n = 106, 46.1\%$) due to the pandemic.

4.4. SoC of nursing students and faculty members

The SoC scores of the nursing students belong to the low SoC range (Holmefur et al., 2015). Vietnamese nursing students scored significantly higher on the SoC scale ($M = 57.49, SD = 9.21$) compared to students from other countries (Supplementary Table 3). A one-way ANOVA found a significant difference in mean SoC scores between students from different countries ($F (9, 1193) = 11.833, p < 0.01$). The LSD test results in Table 5 show the significant mean differences in SoC scores across the different countries. Higher SoC scores were significantly associated with higher C-scale ($r (1191) = 0.401, p < 0.01$) and KAQ-MHC ($r (1098) = 0.487, p < 0.01$) scores. Additionally, higher SoC scores were negatively correlated with the students' scores on the KAQ-GAD ($r (1098) = -0.488, p < 0.01$).

Generally, the faculty members had a medium level of SoC (Holmefur, 2014). Singaporean ($M = 73.11, SD = 13.21$) and Indonesian ($M = 69.26, SD = 9.60$) faculty members scored higher on the SoC questionnaire, Japanese faculty members ($M = 52.64, SD = 11.54$) scored lower (Supplementary Table 5). A one-way ANOVA was conducted, and there was a significant difference in mean SoC scores between the faculty members of different nationalities ($F (9, 257) 9.881, p < 0.01$). As seen in Table 6, the mean SoC scores of Singaporean faculty members was significantly higher than that of the other countries (except for Vietnam and Indonesia). Likewise, the faculty members' SoC scores were significantly correlated with KAQ-MHC ($r (233) 0.502, p < 0.01$) and KAQ-GAD ($r (230) -0.530, p < 0.01$) respectively. The discrepancies in $n$ values for both groups can be attributed to incomplete responses.

4.5. Stress levels of nursing students and faculty members

The participants’ stress levels were examined using the SASRQ scores (Supplementary Tables 3 and 5). Laotian nursing students ($M = 70.30, SD = 24.89$) and faculty members ($M = 68.76, SD = 27.57$) had higher SASRQ scores, indicating that they experienced more stress symptoms. A one-way ANOVA found significant differences in SASRQ scores across the ten countries for both nursing students ($F (9, 1153) = 17.032, p < 0.01$) and faculty members ($F (9, 243) = 5.509, p < 0.01$). Laotian participants (Tables 7 and 8) had significantly higher scores on SASRQ than students from the other countries, except for Philippines.

Higher SoC scores were correlated with lower SASRQ scores for all nursing students ($r (1163) = -0.485, p < 0.01$) and faculty members ($r (252) = -0.589, p < 0.01$). There was also a significant negative association between the students' satisfaction with the new learning modalities and their acute stress symptoms ($r (1148) = -0.104, p < 0.01$). The SASRQ scores of nursing faculty members were also negatively correlated with their satisfaction with the new teaching modalities ($r (247) = -0.338 p < 0.01$).

Furthermore, the results found a significant negative correlation between SASRQ scores and KAQ-MHC for both students ($r (1098) = -0.260, p < 0.01$) and faculty members ($r (233) = -0.419, p < 0.01$). Likewise, the correlation between SASRQ scores and the KAQ-GAD scores was significantly positive for students ($r (1098) = 0.596, p < 0.01$) and faculty members ($r (231) = 0.657, p < 0.01$). No gender differences were found for any outcome variables.

5. Discussion

This study aimed to examine the experiences and psychosocial well-being of nursing students and faculty members in SEANERN-affiliated universities during the COVID-19 pandemic. Majority of the participants were females, and Thai participants make up the highest percentage of faculty members and students from a given country. Most nursing students and faculty members were satisfied with the new learning/teaching modalities implemented during the pandemic.

Nursing students from Laos had statistically higher confidence scores compared to the students from the other countries. The higher confidence levels in Laotian nurses could be fueled by the licensing scheme implemented by the Lao government during the COVID-19 pandemic to enhance the abilities of healthcare personnel (WHO, 2020b). For the

| Country | Mean age | Gender | Marital status |
|---------|----------|--------|----------------|
| Cambodia | 20.98 | 61 | 222 | 274 | 8 | 1 |
| Hong Kong | 21.50 | 17 | 67 | 82 | 2 | 0 |
| Indonesia | 24.46 | 20 | 129 | 115 | 31 | 4 |
| Japan | 21.85 | 2 | 94 | 3 | 0 |
| Laos | 23.85 | 16 | 109 | 106 | 20 | 3 |
| Malaysia | 22.45 | 37 | 123 | 3 | 2 | 156 |
| Philippines | 22.56 | 8 | 27 | 36 | 0 | 0 |
| Singapore | 21.99 | 35 | 100 | 130 | 5 | 0 |
| Thailand | 20.36 | 34 | 411 | - | - | - |
| Vietnam | 21.04 | 29 | 112 | 129 | 7 | 5 |

Nursing faculty members

| Country | Mean age | Gender | Marital status |
|---------|----------|--------|----------------|
| Cambodia | 39.72 | 2 | 27 | 3 | 26 | 0 |
| Hong Kong | 37.81 | 4 | 16 | 6 | 14 | 1 |
| Indonesia | 40.58 | 10 | 26 | 2 | 34 | 0 |
| Japan | 40.00 | - | - | 8 | 7 | 0 |
| Laos | 41.90 | 6 | 25 | 8 | 23 | 0 |
| Malaysia | 42.28 | 10 | 55 | 17 | 47 | 1 |
| Philippines | 39.21 | 4 | 9 | 10 | 4 | 0 |
| Singapore | 42.64 | 3 | 11 | 2 | 11 | 1 |
| Thailand | 41.64 | 4 | 120 | 67 | 53 | 4 |
| Vietnam | 39.80 | 4 | 11 | 0 | 15 | 0 |

a Data was not recorded for this item.
Table 4
Multiple comparison of Confidence scale scores between countries (mean differences).

| Country     | Mean   | Mean difference |
|-------------|--------|-----------------|
| Cambodia    | 15.61  |                 |
| Hong Kong   | 15.09  | –1.54            |
| Indonesia   | 16.64  | –2.61            |
| Japan       | 10.42  | –2.76            |
| Laos        | 18.27  | –1.54            |
| Malaysia    | 14.81  | –1.69            |
| Philippines | 11.63  | –3.21            |
| Singapore   | 14.33  | –3.21            |
| Thailand    | 16.79  | –1.69            |
| Vietnam     | 16.76  | –1.69            |

Table 5
Least significant difference test for SoC scores of nursing students (mean differences).

| Country     | Mean   | Mean difference |
|-------------|--------|-----------------|
| Cambodia    | 54.08  |                 |
| Hong Kong   | 53.39  | –1.69            |
| Indonesia   | 55.09  | –2.40            |
| Japan       | 52.70  | –3.90            |
| Laos        | 56.60  | –2.14            |
| Malaysia    | 47.93  | –2.14            |
| Philippines | 45.79  | –2.14            |
| Singapore   | 52.79  | –2.14            |
| Thailand    | 57.08  | –2.14            |
| Vietnam     | 57.49  | –2.14            |

Table 6
Least significant difference test for sense of coherence scores of faculty members (mean differences).

| Country     | Mean   | Mean difference |
|-------------|--------|-----------------|
| Cambodia    | 57.56  |                 |
| Hong Kong   | 56.00  | –13.26           |
| Indonesia   | 69.26  | –21.3            |
| Japan       | 55.18  | –7.12            |
| Laos        | 48.00  | –14.31           |
| Malaysia    | 47.93  | –7.00            |
| Philippines | 45.79  | –11.9           |
| Singapore   | 52.79  | –4.40            |
| Thailand    | 57.08  | –0.293           |
| Vietnam     | 57.49  | –0.293           |

Table 7
Least significant difference test for Stanford Acute Stress Reaction Questionnaire scores of nursing students.

| Country     | Mean   | Mean difference |
|-------------|--------|-----------------|
| Cambodia    | 55.03  |                 |
| Hong Kong   | 46.59  | –9.44           |
| Indonesia   | 52.80  | –12.7           |
| Japan       | 40.06  | –30.2           |
| Laos        | 70.30  | –10.4           |
| Malaysia    | 59.90  | –8.51           |
| Philippines | 68.41  | –36.9           |
| Singapore   | 31.47  | –10.4           |
| Thailand    | 41.86  | –2.14           |
| Vietnam     | 39.72  | –2.14           |

*p < 0.05.
nurses and other healthcare workers from Laos, receiving the license during COVID-19 was a form of recognition for their contributions to their country's healthcare, motivating them to focus more on providing care to patients (WHO, 2020h).

All participants showed moderate to high levels of positive well-being (Keyes, 2009). According to the KAQ-GAD scores (measuring anxiety), both groups had minimal to mild levels of anxiety (Spitzer et al., 2006). Thus, despite the stress the COVID-19 pandemic had brought about, nursing students and faculty members coped well. This might be because the participants were well-supported by their peers and facilitators, enabling them to have someone to turn to when they are stressed. A qualitative study by Roca et al. (2021) revealed that support from loved ones helped the nursing students who were working as auxiliary healthcare personnel to withstand the difficulties that arose during the pandemic. Thus, having good social support can help to improve one's mood and reduce negative emotions such as stress and anxiety (Xiao et al., 2020).

Many students felt that their learning was affected by the pandemic despite being mostly satisfied with the new learning modalities. Subedi et al. (2020) found that nursing students in Nepal had trouble concentrating in classes due to internet connection problems or the lack of attention from their educators. As internet connection related issues were not highlighted in this study, other factors such as the fear of contracting the virus and infecting their family members might have dissuaded students from their academics (Hasan and Khan, 2020). Similar to the present study, a significant proportion of Turkish nursing students completing their clinical attachment viewed the pandemic as a limiting factor to their learning due to insufficient supervision by their preceptors (Ulenaers et al., 2020). As the present study did not include qualitative data, further research is needed to explain the students' attitudes and feelings towards their learning experiences.

The SoC scores of the nursing students corresponded to Holmefur's (2014) strata of low SoC values, while that of faculty members corresponded to the medium SoC strata. Hence, nursing students tend to have a weaker SoC. Previous research on SoC in nurses noticed that the unpredictability of the nursing working environment affected the manageability of the challenges faced (Eriksson et al., 2019). As new safety measures are often implemented due to the evolving circumstances during the pandemic, students may struggle with this uncertainty. Since manageability is a domain of SoC, it is likely that the pandemic has contributed to the lower SoC scores of nursing students.

The high scores on the SASRQ measuring stress indicated that the nursing students were experiencing high levels of stress, except for Singaporean students. In comparison, nursing faculty members had a lower mean SASRQ score. Students from Cambodia, Hong Kong, Laos, Malaysia and Philippines were found to be experiencing high stress levels. Adapting to new modes of learning or teaching, changing regulations and nursing shortages might have placed strong pressures on the nursing students and faculty members (Aslan and Pekince, 2020). Singaporean nursing students may experience relatively low stress levels due to the manner in which the pandemic was handled in their country. Surveys conducted found that most Singaporeans trusted their government to relay facts and implement reasonable safety regulations (Lim et al., 2020). Singaporean nursing students may thus feel less threatened by the pandemic as they believe in their government's decisions to improve the situation. This trust correlated with an increased tendency to adopt pro-health behaviors (Lim et al., 2020). Therefore, macro-level efforts can exert important effects onto different sectors of the country. Maintaining open communication at the population level may be crucial for countries to get the pandemic under control.

In line with existing literature (Szovák et al., 2020; Schäfer et al., 2019), having a stronger SoC was associated with lesser stress symptoms in nursing students. Most of the faculty members' SoC levels were also associated with lower SASRQ scores, except for Laotian and Vietnamese faculty members who showed statistically insignificant positive correlations between the two variables. This might be due to the small sample size recruited from these two countries. A bigger sample size is needed to determine if this correlation persists. Overall, the results lend support to the Salutogenesis theory, suggesting that more emphasis should be placed on strengthening one's SoC so as to improve their psychosocial well-being (Szovák et al., 2020). Interventions that aim to improve the well-being and working efficacy of both existing nurses and nursing students could focus on helping them regulate their emotions and increase their sense of belonging at work (Henning et al., 2017).

The present study also found a consistent negative correlation between the SASRQ scores and the KAQ-MHC scores (measuring mental well-being), as well as between SoC scores and SASRQ scores. Not surprisingly, the KAQ-GAD scores were positively associated with the SASRQ scores, showing that having higher anxiety levels is associated with the experience of stress. Since SoC is a significant predictor of engaging in alternative activities and seeking social situations, students and faculty members with higher SoC may participate in more enjoyable activities that would help to enhance psychosocial well-being (Konaszewski et al., 2019). Given that the design of the present study limits its ability to draw causal conclusions, future research is needed to support this finding.

### 5.1. Limitations and considerations for future research

This study evaluated the impact of the COVID-19 pandemic on the nursing students’ and faculty members’ psychosocial well-being, along with the students' confidence in their nursing competence. However, some areas have limited the generalizability of the results. Although the target sample size for nursing students was attained, there were many incomplete responses. Hence, some of the countries were underrepresented on particular scales (Supplementary Table 1). The present study also did not include robust demographic information like education level (year of the undergraduate nursing course), which could have been correlated with the key outcome variables. Additionally, qualitative

### Table 8

| Country   | Cambodia | Hong Kong | Indonesia | Laos | Malaysia | Philippines | Singapore | Thailand | Vietnam |
|-----------|----------|-----------|-----------|------|----------|-------------|-----------|----------|---------|
| Mean      | 42.75    | 12.4      | 10.4      | -27.8| -3.40    | -8.02       | 13.8      | 9.05     | 13.2    |
| Mean difference | -2.19 | 14.6      | 12.7      | -22.0| -1.21   | -5.83       | 16.0      | 11.2     | 15.4    |
| Mean      | 30.40    | -1.87     | -13.9     | -18.6| 3.27     | -1.49       | 2.67      |          |         |
| Mean difference | -36.6 | -20.7    | 16.1      | 38.0 | 36.8    | 27.4        |          |          |         |
| Mean      | 26.00    | -4.62     | -21.8     | -4.76| -6.00    |             |          |          |         |
| Mean difference | -34.7 | -20.7    | 16.1      | 38.0 | 36.8    | 27.4        |          |          |         |
| Mean      | 68.76    |          |          |      |          |             |          |          |         |
| Mean difference |    |          |          |      |          |             |          |          |         |
| Mean      | 46.21    |          |          |      |          |             |          |          |         |
| Mean difference |    |          |          |      |          |             |          |          |         |
| Mean      | 50.83    |          |          |      |          |             |          |          |         |
| Mean difference |    |          |          |      |          |             |          |          |         |
| Mean      | 29.00    |          |          |      |          |             |          |          |         |
| Mean difference |    |          |          |      |          |             |          |          |         |
| Mean      | 33.44    |          |          |      |          |             |          |          |         |
| Mean difference |    |          |          |      |          |             |          |          |         |
| Mean      | 29.60    |          |          |      |          |             |          |          |         |
| Mean difference |    |          |          |      |          |             |          |          |         |

\(^* p < 0.05.\)
data may be needed to provide an overall clearer picture of the experiences the nursing students and faculty members, especially to explain why they had difficulties focusing on their academics and how they coped with the pandemic. Thus, future studies may seek to obtain a deeper understanding about these issues by triangulating the findings using qualitative methods.

6. Conclusion

This study explored the experiences and psychosocial well-being of nursing students and faculty members during the COVID-19 pandemic, as well as how their learning or teaching has been affected. While most of the participants from both groups were satisfied with the new educational modalities and had good psychosocial health overall, a significant proportion of the nursing students were experiencing high levels of stress. Thus, the new learning modalities could be improved upon to enrich the educational and clinical experience of nursing students. In general, the present study supports the Salutogenic theory, which posits that having a strong SoC could help individuals to cope with stressors better and manage them efficiently. Hence, interventions can be developed to strengthen the SoC of nursing students and working nurses to help them cope better during stressful situations like the COVID-19 pandemic.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.nedt.2022.105277.

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Country-specific ethical approval was sought from all participating institutions.

Data availability

All the data have been provided via supplementary files. Any further information can be requested from the corresponding author via email upon reasonable request.

Declaration of competing interest

No conflict of interest has been declared by the author(s).

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