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Psychological Stress and Coping Strategies among Nursing Students during the Covid-19 Pandemic: A Cross-Sectional Study

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Abstract— Nursing students encountered distinctive obstacles during their academic careers due to the COVID-19 pandemic. An increase in mental health concerns was the consequence of the pandemic, which necessitated numerous modifications to their daily routines. Subsequently, students have implemented distinct stress-management strategies that are contingent upon their individual perspectives. **Objective:** This study aimed to investigate the psychological stress levels and coping strategies employed by nursing students during this time. **Materials and Methods:** This cross-sectional investigation was implemented online. The data were gathered through online surveys, which encompassed assessments of stress perception and coping strategies. The survey was divided into three sections: Part A collected demographic data, Part B employed the Perceived Stress Scale (PSS), and Part C employed the Coping Strategies Scale. **Results:** The study included a total of 220 respondents, who were between the ages of 18 and 25. Among undergraduate students, Year 4 had the maximum representation (35%), followed by Year 1 (22.2%), Years 2 and 3 (21.4%), and so forth. Moderate worry was reported by the majority of students (70.9%). The mean (\pm SD) score on the Perceived Stress Scale was 20.54 (\pm 6.062), and the mean (\pm SD) score on the Coping Strategies Scale was 39.47 (\pm 5.848). **Conclusion:** The study did not identify any correlation or impact between the perceived stress scale, coping strategies, or any of the sociodemographic factors among nursing students. The examination of these factors will enhance comprehension of the mental health obstacles encountered by nursing students during the pandemic. This information can guide the development of targeted interventions by healthcare providers and educational institutions, including stress management workshops, enhanced access to mental health resources, and modifications to curriculum delivery to more effectively support student well-being during future crises.

Keywords— psychological stress, coping strategies, nursing students, Covid-19, pandemic

I. INTRODUCTION

The COVID-19 pandemic significantly altered the global educational landscape. Nursing students faced unique challenges as their education and clinical placements were suspended due to social distancing measures, disrupting their daily routines and leading to heightened mental health issues

within this group [1][2]. Stress is defined as a dynamic interaction between an individual and their environment in which demands exceed available coping resources, a concept that is well established [3][4]. The pandemic resulted in increased stress due to public health threats and anxiety stemming from the virus itself [5][6]. Issues related to clinical

placements, such as changes or delays, heightened students' concerns about performing well in their studies and the risk of virus transmission in healthcare settings [7][8]. Nursing students experienced significant stress during the COVID-19 pandemic, with varying rates reported across different countries [9].

The pandemic intensified existing stressors and introduced new challenges, including fear of the virus, anxiety surrounding distance learning, and concerns associated with clinical training [10]. Students employed strategies such as emotion-focused techniques, seeking support, and fostering a positive mindset [10][11]. The pandemic's impact on nursing education necessitated a shift to online learning, resulting in increased stress [12]. Researchers emphasise the need for stress management programmes and enhanced training and safety protocols to support nursing students during crises and prepare them for future pandemics [12]. Based on their unique challenges and preferences, students probably used various coping mechanisms to deal with pandemic-induced stress [13]. Nevertheless, further investigation is required into these aspects, particularly in Malaysia [10].

The knowledge gap is significant, as nursing students represent a vulnerable group susceptible to increased stress from academic disruptions, anxiety about viral transmission, and fears regarding their future careers in healthcare. This cross-sectional study aims to investigate psychological stress and coping mechanisms among undergraduate nursing students in Malaysia during the COVID-19 pandemic. The findings will provide critical insights into their mental health experiences throughout this crisis, enabling educational and healthcare institutions to develop interventions that promote student well-being and foster a resilient future nursing workforce.

II. METHODS

The cross-sectional study was conducted over two months at the Kulliyyah of Nursing, IIUM, in Malaysia. Participants were selected through purposive sampling. The total population of nursing students, ranging from the first to the fourth year, was 428. The sample size was determined using the Raosoft Sample Size Calculator, incorporating a 50% response distribution, a 5% margin of error, and a 95% confidence interval. The recommended sample size was 223; however, due to specific limitations, data were collected from 220 participants. The inclusion criteria required that participants be actively enrolled in undergraduate nursing programmes and consent to participate in the research. Meanwhile, exclusion criteria included students not enrolled in nursing programmes, individuals with pre-existing mental health disorders, and those unwilling to participate who were omitted from the study.

A. Data Collection and Tools

This study aimed to assess the psychological stress and coping mechanisms of nursing students during the COVID-19

epidemic. Data were gathered using a self-administered questionnaire disseminated online via Google Forms. The survey link was shared with student representatives to ensure extensive participation. Note that no identifying information was collected, thus preserving the anonymity of the participants. The contact information for representatives was used solely for dissemination purposes. The questionnaire consisted of three sections:

Section A: Socio-demographic Information: Data on age, gender, year of study, and interest in nursing were collected.

Section B: Perceived Stress Scale (PSS): This section employed a modified 10-item variant of the Perceived Stress Scale (Pedrozo-Pupo, Arias, & Pedrozo-Cortes, 2020). Items 1, 2, 3, 6, 9, and 10 were evaluated on a scale from 0 to 4, whereas items 4, 5, 7, and 8 were rated in reverse (from 4 to 0). The overall score ranged from 0 to 40, with stress levels classified as low, moderate, or high. Elevated scores signified higher perceived stress.

Section C: Brief Coping Orientation to Problems Experienced (Brief COPE) Inventory: This section assessed coping strategies using 15 items adapted from the COPE Inventory (Ab Latif & Mat Nor, 2019), specifically tailored to the context of the pandemic. Responses were evaluated using a four-point Likert scale, with 1 indicating "I typically did not engage in this behaviour" and 4 denoting "I typically engaged in this behaviour frequently." The Brief COPE Inventory highlights three primary forms of coping: avoidant coping, approach coping, and neither/nor coping, each comprising distinct subscales.

- **Avoidant Coping:** The subscales include denial, substance use, venting, behavioural disengagement, self-distraction, and self-blame.
- **Approach Coping:** The subscales encompass active coping, positive reframing, planning, acceptance, seeking emotional support, and seeking informational help.
- **Neither/Nor Coping:** This category is characterised by subscales that include humour and religious methodologies for stress management.

The three types of coping strategies provide a comprehensive perspective on the various methods employed by nursing students to alleviate stress during the COVID-19 pandemic. For each subscale, a raw score was derived by aggregating the values of the items within that subscale. The scores were subsequently classified into low, moderate, and high coping strategies. A higher score on a specific subscale indicates a greater tendency for an individual to regularly utilise that coping method. A pilot study involving 25 undergraduate nursing students was conducted to evaluate the reliability of the adapted PSS and the Brief COPE Inventory, using Cronbach's alpha to measure internal consistency.

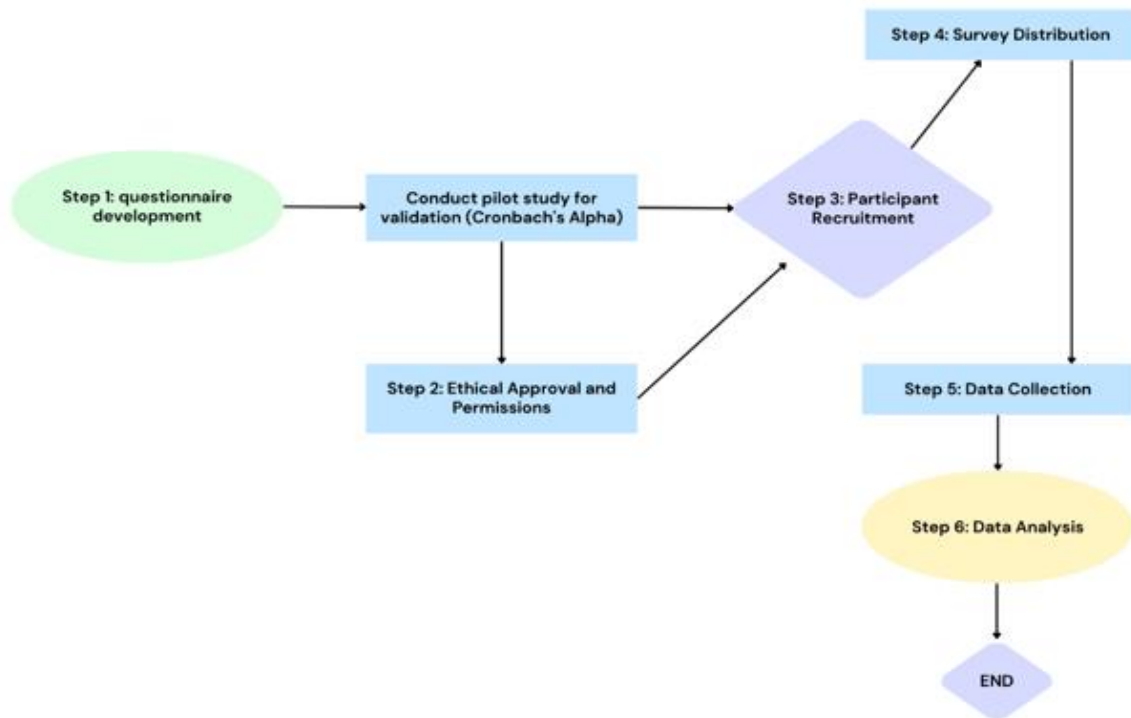


Figure 1. Data Collection Procedures Flowchart

B. Data Analysis

The data were analysed using IBM SPSS Statistics version 19. To ensure the results' reliability and accuracy, the following statistical procedures were applied:

1) *Descriptive Statistics*: To summarise the sociodemographic data, providing an overview of the participants' characteristics, including age, gender, year of study, and interest in nursing, descriptive statistics were employed.

2) *Perceived Stress and Coping Strategy Scores*: Total scores for the Perceived Stress Scale (PSS) and the Brief COPE Inventory were calculated. These scores were used to classify stress levels (low, moderate, or high) and categorise coping strategies (low, moderate, or high), providing insight into how participants experienced and managed stress during the COVID-19 pandemic.

3) *Pearson's Chi-Square Test*: Pearson's Chi-Square tests were conducted to examine potential correlations between sociodemographic variables (e.g., gender, age, year of study) and both stress and coping scores. This test explored the association between categorical variables, with a significance level set at $p < 0.05$.

Using this combination of descriptive and inferential statistics, the analysis provides a comprehensive, reliable examination of the relationships between demographic variables, stress levels, and coping strategies among nursing students.

C. Ethical Considerations

Prior to conducting the study, the ethical approval from the Kulliyyah of the Nursing Postgraduate Research Committee (KNPGRC) and the IIUM Ethics Committee (IREC) was obtained with reference number IREC 2021-KON/70. Informed consent was obtained from all participants, and their participation was voluntary. Throughout the research process, strict confidentiality of the participants' identities and data was maintained.

III. RESULTS

A. Sociodemographic Characteristics of Participants

The study included a total of 220 undergraduate nursing students from the Kulliyyah of Nursing, IIUM Kuantan. Participants' ages ranged from 18 to 25 years, with the majority being female (81.8%) and male students comprising 18.2% of the sample. Regarding age distribution, 58.6% of the participants were aged 22 to 25 years, while 41.4% were aged 18 to 21 years. The representation across different years of study revealed that Year 4 students constituted the largest group (35%), followed by Year 1 students (22.2%) and both Year 2 and Year 3 students at 21.4% each. Interest in nursing was also assessed, with the majority of participants (76.4%) expressing a strong interest in pursuing nursing, while 23.6% indicated a weaker interest. The details are presented in Table I.

TABLE I. SOCIODEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS (N = 220)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	180	81.8
	Male	40	18.2
Age	18 - 21 years	91	41.4
	22 - 25 years	129	58.6
Year of Study	Year 1	49	22.2
	Year 2	47	21.4
	Year 3	47	21.4
	Year 4	77	35.0
Interest in Nursing	Yes	168	76.4
	No	52	23.6

B. Participants' Experienced Stress Related to COVID-19

Most nursing students reported experiencing moderate stress related to the COVID-19 pandemic (70.9%). A smaller proportion reported high perceived stress (16.4%) and low stress (12.7%). This distribution highlights the significant psychological impact of the pandemic on nursing students, emphasising the need for targeted stress management interventions. The details are presented in Table II and illustrated in Figure 2.

TABLE II. STRESS LEVELS RELATED TO COVID-19 AMONG PARTICIPANTS

Stress Level	Frequency (n)	Percentage (%)
Low (0-13)	28	12.7
Moderate (14-26)	156	70.9
High (27-40)	36	16.4

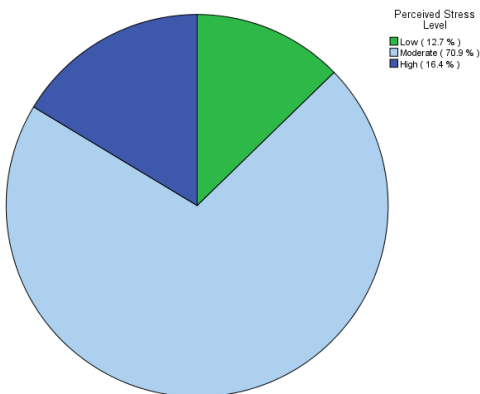


Figure 2. Stress Levels Related to COVID-19 Among Participants

C. Coping Strategies Employed by Participants

Most students (79.1%) employed moderate coping strategies in response to COVID-19 stress. A small proportion of students (5.9%) reported using low coping strategies, while 15% demonstrated high coping strategies. The details are presented in Table III and illustrated in Figure 3.

TABLE III. COPING STRATEGIES EMPLOYED BY PARTICIPANTS

Coping Strategy Level	Frequency (n)	Percentage (%)
Low (0-13)	13	5.9
Moderate (14-26)	174	79.1
High (27-40)	33	15.0

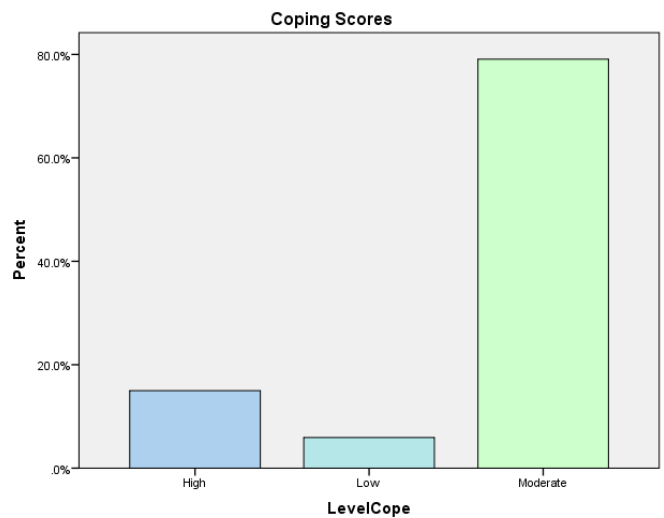


Figure 3. Coping Strategies Employed by Participants

D. Association Between Stress Levels and Sociodemographic Variables

Chi-square tests were conducted to determine whether there were any statistically significant associations between stress levels and selected demographic variables (gender, age, year of study, and interest in nursing). The results indicated no significant associations between stress levels and these variables in which gender ($\chi^2 = 0.367, p > 0.05$), age ($\chi^2 = 0.201, p > 0.05$), year of study ($\chi^2 = 0.222, p > 0.05$) and interest in nursing ($\chi^2 = 0.728, p > 0.05$). The p-values for all variables are greater than 0.05 ($p > 0.05$), suggesting that stress levels among nursing students during the pandemic were independent of their demographic characteristics. The details are presented in Table IV.

TABLE IV. ASSOCIATION BETWEEN STRESS LEVEL AND DEMOGRAPHIC VARIABLES

Variable	df	P-Value
Gender	1	0.367
Age	1	0.201
Year of Study	1	0.222
Interest in Nursing	1	0.728

E. Association Between Coping Strategies and Sociodemographic Variables

Similar chi-square tests were performed to explore the association between coping strategies and demographic variables. The results revealed no significant associations between coping strategies and these variables in which gender ($\chi^2 = 0.296$, $p > 0.05$), age ($\chi^2 = 0.151$, $p > 0.05$), year of study ($\chi^2 = 0.232$, $p > 0.05$) and interest in nursing ($\chi^2 = 0.936$, $p > 0.05$). The p-values for all variables are greater than 0.05 ($p > 0.05$), suggesting that the coping strategies used by nursing students were not influenced by their gender, age, year of study or interest in nursing. The details are presented in Table V.

TABLE V. ASSOCIATION BETWEEN COPING STRATEGY LEVEL AND DEMOGRAPHIC VARIABLES

Variable	df	P-Value
Gender	1	0.296
Age	1	0.151
Year of Study	1	0.232
Interest in Nursing	1	0.936

IV. DISCUSSION

This cross-sectional study investigated the psychological stress and coping strategies employed by undergraduate nursing students at the Kulliyah of Nursing, IIUM Kuantan, during the COVID-19 pandemic. The findings offer valuable insights into the mental health experiences of this vulnerable student population during a global crisis.

A. Stress Levels Among Nursing Students

The majority of participants (70.9%) reported experiencing moderate levels of stress related to the COVID-19 pandemic, which is consistent with similar studies conducted among nursing students worldwide during this period. For example, a study by Sheroun et al. (2020) noted that 64.5% of nursing students in India reported moderate stress levels during the pandemic [14]. Similarly, Awoke et al. (2021) reported moderate stress levels among 82.67% of undergraduate health science students in Ethiopia. These findings suggest that nursing students, as a group, face unique challenges during health crises, especially when such crises disrupt their academic progression and clinical training [15].

The moderate stress levels observed in this study may be attributed to multiple factors, including the shift to online learning, changes in clinical placements, and the general uncertainty caused by the pandemic. Nursing students, in particular, faced concerns regarding their academic performance and future career prospects, which may have contributed to their elevated stress levels. Furthermore, the sudden adaptation to online education posed additional challenges for students who were previously accustomed to hands-on training in clinical settings [12].

Moreover, female students reported significantly higher stress levels than male students during the COVID-19 pandemic. This gender difference in the present study may be partly attributed to the composition of the sample, in which female students were predominant (81.8%). A similar result

was discovered in a study conducted among university students from Southeast Serbia, where statistically significant gender differences in the psychological consequences of the pandemic were observed, with females suggesting higher stress levels [16].

Stress scores also exhibited a consistent increase from Year 1 to Year 4. First-year students may experience heightened stress due to disruptions in their education and clinical practices at the beginning of their journey, as well as their lower level of professional knowledge and skills. In addition, fourth-year students experience anxiety about graduation and the transition to professional practice, raising concerns about their well-being [7].

B. Coping Strategies Employed by Participants

In response to stress, most students (79.1%) employed moderate coping strategies, with a smaller percentage (15%) using high coping strategies. These findings align with previous research suggesting that nursing students tend to use a combination of problem-focused and emotion-focused coping strategies. For example, a study by Dasgupta et al. (2020) mentioned that 76.58% of nursing students exhibited moderate coping styles during stressful periods, supporting the claim that most students maintain a balance between different coping approaches [17].

Nursing students in this study primarily used approach coping methods, such as seeking emotional and informational support, acceptance, and active coping. This is consistent with findings from other studies, which highlight that nursing students tend to rely on problem-solving and emotional regulation techniques to manage their stress [13]. However, avoidant coping strategies, such as denial, self-distraction, and venting, were less commonly employed by the participants, which may indicate a more proactive approach to managing pandemic-related stress.

C. Association Between Stress Levels and Demographic Variables

This study discovered that stress levels were not significantly associated with gender ($\chi^2 = 0.367$, $p > 0.05$), age ($\chi^2 = 0.201$, $p > 0.05$), year of study ($\chi^2 = 0.222$, $p > 0.05$), or interest in nursing ($\chi^2 = 0.728$, $p > 0.05$). These findings are consistent with those reported by Pedrozo-Pupo et al. (2020)[18].

[18]. Research by Cao et al. (2020) and Misirlis et al. (2020) highlighted the challenges nursing students face due to changes in clinical experiences and fears of contracting COVID-19 in healthcare settings. This study reported no significant associations between stress levels and gender. This may be due to the predominantly female sample (81.8%), which could have minimised gender-based differences in stress perception [10][19]. Alternatively, this finding may indicate that the pandemic's impact on stress levels was uniform across genders within this specific population of nursing students, as both male and female students faced similar academic and clinical challenges [7].

In addition, the analysis did not reveal any statistically significant associations between stress levels and age or year of study. However, it is crucial to note that fourth-year students

reported slightly higher stress levels compared to those in earlier years, likely due to concerns related to graduation and entering the workforce during a global health crisis. This observation is supported by Elinar (2022), who noted that senior nursing students often experience higher levels of anxiety and stress as they prepare to transition from academia to professional practice [20]. In this study, first-year students experienced increased stress at the commencement of their academic journey due to disruptions in their education and clinical training, as well as their relatively lower levels of professional knowledge and experience in response to the pandemic, as similarly noted by Aslan and Pekince (2020) [7].

D. Association Between Coping Strategies and Demographic Variables

Regarding the analysis of coping strategies used by participants in this study, there were no significant connections with demographic factors such as gender ($\chi^2 = 0.296$, $p > 0.05$), age ($\chi^2 = 0.151$, $p > 0.05$), year of study ($\chi^2 = 0.232$, $p > 0.05$), or interest in nursing ($\chi^2 = 0.936$, $p > 0.05$). This suggests that these aspects did not have a significant impact on students' coping mechanisms during the pandemic. This finding aligns with earlier research indicating that coping strategies are more closely linked to individual psychological resilience and personal coping resources than demographic characteristics [13]. Regardless of their demographic backgrounds, nursing students appeared to employ a similar range of coping mechanisms, both problem-focused and emotion-focused, in response to pandemic-related stress.

In a related study, Teh et al. (2023) examined how sociodemographic, psychological, and coping factors, among others, influenced anxiety levels in medical students. The study, which included 371 participants from a tertiary education centre, revealed an overall anxiety rate of 37%, with 15.4% experiencing high anxiety and 21.6% reporting moderate anxiety. Age and academic year were significantly linked to anxiety levels. Additionally, correlation coefficients (r_s) of -0.487, -0.407, -0.499, and -0.245 revealed that higher levels of self-esteem, competence, liking, and efficacy were generally associated with lower anxiety. Increased anxiety was also linked to emotion-focused ($r_s = 0.130$) and dysfunctional coping strategies ($r_s = 0.559$). Furthermore, individuals with higher self-liking were less likely to experience anxiety (adjusted odds ratio [aOR] = 0.81), while those employing dysfunctional coping mechanisms faced a higher risk of anxiety (aOR = 1.16) [21]. These two studies together highlight that while demographic factors may not play a significant role in coping strategies, psychological resilience and personal coping resources are crucial in determining how individuals manage stress and anxiety.

E. Limitations

One significant limitation of this study is its exclusive focus on nursing students from a single setting, which may restrict the generalisability of the findings. Additionally, the study did not investigate the relationship between perceived stress levels and the types of coping strategies employed. Hence, future research should aim to encompass a more diverse range of student groups from multiple settings to obtain broader insights.

Furthermore, examining the connection between perceived stress and specific coping mechanisms would enhance understanding of how different coping strategies influence stress management among nursing students. Incorporating qualitative approaches could also provide a richer context regarding their experiences.

F. Implications for Practice and Recommendations

The findings from this study hold significant implications for both educational institutions and healthcare providers. Implementing targeted stress management programmes and improving access to mental health resources are essential steps to support nursing students during periods of crisis. Additionally, resilience-building training and the development of flexible educational models, such as hybrid learning, could better equip students to face future challenges.

Universities and healthcare institutions can leverage these findings to develop targeted interventions that enhance the emotional well-being of nursing students during crises such as the COVID-19 pandemic. By offering stress management workshops, improving mental health support, and adapting curriculum delivery, institutions can equip students with the necessary skills to effectively manage stress and maintain their well-being.

V. CONCLUSION

This study provides valuable insights into the stress levels and coping strategies of nursing students during the COVID-19 pandemic, emphasising the need for ongoing support for this vulnerable group. The findings reveal that moderate stress is common among nursing students, with most employing moderate coping strategies, regardless of demographic differences. These results highlight the critical importance of implementing evidence-based mental health initiatives and stress management programmes to support nursing students.

Moreover, the study underscores the necessity for tailored interventions to enhance students' well-being, especially given the academic and clinical disruptions they face. Future research should delve deeper into the individual factors influencing stress perception and coping mechanisms to develop more personalised support strategies. By doing so, educational institutions and healthcare providers can better prepare nursing students to manage stress effectively and contribute to building a resilient future nursing workforce.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

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