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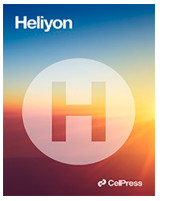

Research article

Comparative analysis of stress level and coping strategies due to COVID-19 pandemics among dental students in Indonesia and Vietnam

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ABSTRACT

Objective: This study investigated and compared the perceived stress levels and coping strategies of dental students in Indonesia and Vietnam during the COVID-19 pandemic.
Materials and methods: A cross-sectional survey was conducted online in 2022 for dental students from the University of Indonesia and Can Tho University, Vietnam (n = 304). Perceived stress levels and coping strategies were assessed using a self-administered questionnaire about student sociodemographic factors, learning experiences, coping strategies, stress-related factors, and stress levels. Data were analyzed using Mann-Whitney, Kruskal Wallis, and Spearman correlation tests.
Results: This study showed the overall mean stress level was 23.9 (SD = 5.63), with a significant difference observed between Indonesian (24.44, SD = 5.14) and Vietnamese students (23.32, SD = 6.13) ($p = 0.016$), indicating potential variations in stress experiences. Key findings include a correlation between living arrangements and stress, as students living independently report higher stress (23.96, SD = 6.24) compared to those living with family (23.95, SD = 5.29) ($p = 0.018$). Fifth-year students exhibit lower stress levels (21.17, SD = 6.12) than other grades ($p = 0.026$). Multiple training sessions about COVID-19 are associated with better coping strategies (9.95, SD = 0.91, $p < 0.001$). The study also revealed different perceptions of COVID-19 learning experiences among dental students in Indonesian and Vietnamese dental students, with significant correlations observed between stress levels, coping strategies, and specific concerns such as graduation time and COVID-19-induced changes ($p < 0.05$).
Conclusion: This study shows students experience moderate stress levels, but the significant differences in stress experiences and coping strategies between the two countries highlighted the need for tailored approaches. Providing social support from faculty, family, friends, and peer dental students was one of the students' strategies to cope and minimize stress levels.

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1. Introduction

In late December 2019, a novel human coronavirus, referred to as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or COVID-19, was first reported in Wuhan Province, China [1]. The World Health Organization (WHO) declared a public health emergency on January 30, 2020, bringing back memories of SARS-2003, which had been caused by another beta-coronavirus 17 years earlier [2].

Given their close geographical proximity to and strong commercial connections with China, Southeast Asians were among the initial victims to experience the impact of COVID-19 [3,4]. From January 3, 2020, to December 17, 2023, the WHO reported 6,817,154 COVID-19 cases and 161,930 deaths in Indonesia. During the same period, in Vietnam, the WHO reported 11,624,000 cases and 43,206 deaths. Based on the latest WHO data, 93 % of the Vietnamese population have been vaccinated, yet only 75 % of Indonesians have received a vaccine [1].

While the Southeast Asian countries faced common challenges, such as overloaded health systems and economic difficulties, each country experienced its own struggles, revealing the multidimensional nature of the pandemic. Indonesia accounted for over half of Southeast Asia's COVID-19 cases one year after it emerged. The Philippines contributed around a quarter, yet Brunei, Laos, and Cambodia reported fewer than 1000 cases in each country [3]. Once the pandemic was declared, governments began to implement lockdown measures due to the virus's rapid spread. This strategy was designed to reduce interpersonal contact, prevent virus transmission, and facilitate treatment for several months. At the national level, the COVID-19 pandemic was determined to end, and the virus was declared endemic, in March 2022 for Vietnam and June 2023 for Indonesia [5,6]. However, the COVID-19 situation has been dynamic throughout the years, and many countries have experienced multiple waves. Each city and institution may also have different regulations in terms of social restrictions and may set variable operating hours based on need. Challenges have emerged in various aspects of daily life throughout this period, affecting educational institutions, workplaces, and overall mobility [2,7].

According to Lazarus's transactional model of stress and coping, stress occurs when people perceive a situation as challenging and lack the resources to deal with it. Coping can be problem-focused, which implies analysis and change, or emotion-focused, which involves dealing with the associated emotions [8]. Albert Bandura's social cognitive theory suggests that observing others and building self-efficacy can help people cope with stress [9].

Research has shown that, in addition to being a general stressor, COVID-19 has impacted mental health and well-being through fears of a prolonged outbreak, infection, and exposure to affected individuals. This situation can lead to anxiety, depression, psychosis, and even suicidal tendencies [10,11]. Studies of coping strategies amid the COVID-19 outbreak have shown that gratitude and positivity are the most frequently implemented coping methods. These strategies, a socially supportive environment, and engagement in creative activities have been crucial during the pandemic, as they are associated with faster recovery and fewer mental health symptoms [12].

Dental students have also experienced the effects of COVID-19. The government's implementation of social distancing measures necessitated a transition from offline to online learning systems, as many individuals were required to stay home [13]. The significant shift to digital platforms forced students and teachers to make necessary adjustments, impacting the stress levels experienced by dental students [14]. In addition to the substantial adjustments needed for online learning, other stressors associated with academia, such as grades, workload levels, clinical obligations, examinations, and assessments, have remained significant [14,15].

Studies have indicated that the COVID-19 pandemic has been responsible for elevated stress in dental students [13,14,16]. Multiple factors, including the changes in learning methods, financial stress, and academic stressors, such as examinations and grades, have contributed to this increase. Therefore, educational institutions must understand the stress levels faced by dental students and their coping strategies to ensure proper management in the post-COVID-19 era.

2. Materials and Methods

Study Design and Participants

The present study is reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement [17]. This cross-sectional study, conducted between July 2022 and September 2022 using a questionnaire, was reviewed and approved by the Research Ethics Committee, Faculty of Dentistry, University of Indonesia (Protocol No. 010719822). All first-to fifth-year dental students at the Faculty of Dentistry, Universitas Indonesia (n = 713) and Can Tho University of Medicine and Pharmacy, Vietnam (n = 507) were invited to participate. The minimum sample size to ensure a significance level of 0.05 and a power of 95 % was calculated to be at least 293 dental students. All participants signed an informed consent form before accessing the questionnaire.

Questionnaires

The questionnaire was adapted and modified from previous publications [14,18]. For the Indonesian dental students, the questionnaire was distributed in the original English version, while for the Vietnamese students, it was back-translated into Vietnamese by a translator and edited by the researcher. The validity and reliability of the questionnaire were assessed. Face validity was assessed by an expert panel of dental public health experts, and pilot testing was conducted. The respondents were observed via video conference while filling out the questionnaire [19]. All respondents found the questionnaire easily understandable. A reliability assessment, measured using Cronbach's alpha, yielded values of r = 0.794 for 11 questions on stress-related factors, r = 0.961 for the perceived stress scale, and 0.961 for coping strategies. A score above 0.70 was considered to indicate acceptable reliability [20].

The questionnaire consisted of 45 questions covering five categories of topics.

Table 1
Comparative Analysis between Sociodemographic and Academic Characteristic with Stress Level and Coping Strategies (n = 304).

Variable	ID n(%)	VN n(%)	Overall	Stress Related Factor		Stress Level		Coping Strategies	
				Mean (SD)	p-value	Mean (SD)	p-value	Mean (SD)	p-value
Countries[a]			304 (100%)	28.34 (5.56)		23.9 (5.63)		9.59 (1.01)	
Indonesia	167 (54.9%)			28.69 (5.11)	0.351	24.44 (5.14)	**0.016***	9.35 (1.01)	**<0.001****
Vietnam		137(45.1%)		27.92 (6.06)		23.32 (6.13)		9.87 (1.04)	
Gender[a]									
Female	143 (85.6%)	87 (63.5%)	230 (75.7%)	28.10 (5.26)	0.062	24.14 (6.04)	1.000	9.60 (1.02)	0.733
Male	24 (14.4%)	50 (36.5%)	74 (24.3%)	29.10 (6.4)		23.89 (5.61)			
Living Arrangements[b]									
Living Independently	35 (21%)	92 (67.2%)	127 (41.8%)	28.48 (5.87)	0.523	23.96 (6.24)	0.714	9.74 (1.08)	**0.018***
Living with Family	132 (79%)	45 (32.8%)	177 (58.2%)	28.24 (5.35)		23.95 (5.29)		9.48 (1.02)	
Academic Year[b]									
Fifth Year	15 (9%)	20 (14.6%)	35 (11.5%)	25.20 (6.54)	**0.015***	21.17 (6.12)	**0.026***	9.50 (1.02)	**0.028***
Fourth Year	12 (7.2%)	28 (20.4%)	40 (13.2%)	29.15 (4.41)		25.46 (6.92)		10.00 (1.02)	
Third Year	102 (61.6%)	23 (16.8%)	125 (41.1%)	28.80 (5.03)		24.35 (5.59)		9.40 (1.10)	
Second Year	22 (13.2%)	53 (38.7%)	75 (24.7%)	28.07 (6.02)		23.77 (5.58)		9.66 (0.96)	
First Year	16 (9.6%)	13 (9.5%)	29 (9.5%)	29.76 (5.57)		24.03 (5.71)		9.73 (1.00)	
Training about COVID-19[b]									
None	44 (26.3%)	3 (2.2%)	47 (15.5%)	28.68 (4.37)	0.807	23.70 (4.98)	0.863	9.63 (1.11)	**<0.001****
Few times	102 (61.6%)	50 (36.5%)	152 (50.0%)	28.38 (4.87)		23.75 (4.65)		9.46 (1.06)	
Multiple times	21 (12.6%)	84 (61.3%)	105 (34.5%)	28.13 (6.86)		24.31 (7.16)		9.95 (0.91)	
Dental Student Clinical Activities[b]									
Not a clinical student	75 (44.9%)	33 (24.1%)	108 (35.5%)	28.60 (5.22)	0.411	23.47 (5.02)	0.087	9.63 (1.03)	**0.005****
None	16 (9.6%)	1 (0.7%)	17 (5.6%)	27.06 (3.98)		26.20 (4.03)		9.86 (1.06)	
Few activities on campus	72 (43.1%)	79 (57.7%)	151 (49.7%)	27.95 (5.82)		23.64 (6.06)		9.63 (1.06)	
Yes	4 (2.4%)	24 (17.5%)	28 (9.2%)	30.28 (5.95)		26.14 (6.53)		10.10 (0.87)	
Dental online course[b]									
No online course	1 (0.6%)	2 (1.5%)	3 (1%)	29.00 (10.15)	0.923	29.00 (8.84)	0.539	10.00 (0.00)	0.200
Few online course	153(91.6%)	86 (62.8%)	239 (78.6%)	28.28 (5.36)		23.91 (5.67)		9.55 (1.07)	
Entirely online course	13 (7.8%)	49 (35.8%)	62 (20.4%)	28.34 (5.56)		23.85 (5.66)		9.75 (1.00)	

a. Mann Whitney, b. Kruskall Wallis.

a. Students' sociodemographic factors and academic environments: Questions asked about name, gender, living arrangements, year of study, training on COVID-19, and clinical activities; we also asked whether the students were enrolled in an online course (7 items).
b. Perceived learning experience during COVID-19: We solicited perceptions of transitioning to online courses, faculty preparedness, faculty efforts to address challenges, perceived faculty support, perceived peer support, perceived family support, the impact of COVID-19 on dental education, concerns about graduating on time, and COVID-19-related changes in stress. Items 1 and 2 were answered on a 4-point scale, and items 3–9 were scored on a 5-point scale (for 9 items total). A lower Likert score indicates a more positive response.
c. Student coping strategies: Yes/no questions (negative answer = 1, positive answer = 2) were asked to determine how the students coped with COVID-19 (i.e., not thinking much, reaching out to faculty and staff, reaching out to student peers, reaching out to family and friends, not thinking the situation was affecting them, or not knowing what to do). The scores varied from 6 to 12, where a higher score reflects better coping strategies (6 items).
d. Student stress-related factors: Questions were asked about anxiety and fear using a 4-point scale (strongly disagree = 1, disagree = 2, agree = 3, and strongly agree = 4) [18]. The questions concerned anxiety and fear regarding social relationships (family, friends, professional colleagues, and tutors/lecturers), concerns about examinations, and concerns about losing manual dexterity. The scores varied from 13 to 52 (13 items), with a higher score indicating greater stress.
e. The students' stress levels were measured using the Perceived Stress Scale (PSS), which is frequently used to understand how various events affect our experiences and perceptions of stress. The questions were answered on a 5-point Likert scale to measure individual stress levels (never = 0, almost never = 1, sometimes = 2, fairly often = 3, and very often = 4). The total score for each factor ranged from 0 to 40 (10 items) [14]. The results of the PSS were interpreted as follows: scores ranging from 0 to 13 were considered to signify low stress, 14–26 indicated moderate stress, and 27–40 was interpreted as high stress.

Statistical Analysis

All the data were entered into Microsoft Excel spreadsheets, and analysis was carried out using IBM SPSS Statistics version 25 software. A descriptive analysis was conducted to show sociodemographic information, stress-related factors, and coping strategies for dental students during the COVID-19 pandemic. Relationship between socio-demographics and stress-related factors with level of stress and coping strategies with dental students during the COVID-19 pandemic using the Mann-Whitney and Kruskal-Wallis tests. These tests were used to determine the nature of the non-normal distribution of the data and compare differences between different groups of each variable. Correlative Analysis between Perceived COVID-19 Learning Experience with Stress Level and Coping Strategies was assessed using Spearman analysis, and the Comparison between Indonesia's and Vietnam's scores was also conducted.

Table 2
Correlative analysis between perceived COVID-19 learning experience with stress level and coping strategies; comparation between Indonesia (n = 167) and Vietnam (n = 137).

COVID-19 Learning Experience	Indonesia				Vietnam				*p*-value[b]
	Mean (SD)	Stress Related Factor	Stress Level	Coping Strategies	Mean (SD)	Stress Related Factor	Stress Level	Coping Strategies	
		r-value[a]	r-value[a]	r-value[a]		r-value[a]	r-value[a]	r-value[a]	
Perceived Online Course Transition (1–4)	2.85	−0.019	−0.134	0.049	3.18	−0.029	0,067	−0.14	<0.001**
Perceived Faculty Preparedness (1–4)	2.85	−0.015	0.005	0.139	3.25	−0.129	−0.058	0.007	<0.001**
Perceived Faculty Efforts to address the challenge (1–5)	3.68	−0.20	0.008	0.001	3.84	0.033	0.052	0.073	0.116
Perceived Faculty Supports (1–5)	3.37	0.049	0.069	**0.248****	3.74	0.043	0.059	**0.190**	<0.001**
Perceived Peer Supports(1–5)	4.14	−0.055	−0.020	**0.276****	3.73	−0.015	0.101	0.161	<0.001**
Perceived Family Support (1–5)	4.19	−0.074	0.022	**0.315****	4.28	0.122	**0.193***	**0.177***	0.281
Impact of COVID-19 to their Dental Education (1–5)	3.90	**0.342****	0.092	0.021	4.02	**0.206***	**0.298****	**0.172***	0.185
Graduating on time concern (1–5)	3.84	**0.321****	**0.185***	−0.001	4.14	**0.175***	0.122	**0.191***	0.033*
COVID-19 changes related stress (1–5)	3.13	**0.435****	**0.400****	−0,086	3.42	**0.395****	**0.491****	−0.036	0.019*

*significant at 0.05 **significant at 0.01. Lower scale of COVID-19 learning experience indicates a more positive response.
[a] Spearman Correlation Analysis.
[b] Mann-Whitney.

3. Results

In this study, we analyzed data from 304 respondents, comprising of 167 respondents from the University of Indonesia and 137 respondents from Can Tho University, Vietnam, to assess the impact of various demographic and educational factors on stress level and coping strategies (Table 1). The majority of responders (75.7 %) were female, with Indonesian students predominantly in their third year (61.6 %) and Vietnamese students in their second year (38.7 %).

During the pandemic, 70.4 % of students coped by either avoiding the topic or not thinking much about it. About half (50.7 %) reached out to faculty and staff for assistance. A significant majority (90.4 %) found support from peer dental students, and 87.5 % received emotional support from family and friends. Indonesian students had a higher mean stress level (24.44, SD = 5.14) compared to Vietnamese students (23.32, SD = 6.13) with a p-value of 0.016. Additionally, Indonesian students had a lower mean coping strategies score (9.35, SD = 1.01) compared to Vietnamese (9.87, SD = 1.04), with p-value of <0.001. Living arrangements also played a significant role, with students living independently reporting higher mean coping strategies scores (9.74, SD = 1.08) compared to those living with family (9.48, SD = 1.02) (p-value = 0.018). These differences indicating potential demographic, cultural, or political variations in stress experiences.

The year of entry into dental education showed that fifth-year students experienced significantly lower mean of stress-related factor (25.20, SD = 6.54) and stress levels (21.17, SD = 6.12) compared to other students (p-value = 0.026). Additionally, first-year students showed significant differences in stress-related factors (p-value = 0.015) and coping strategies (p-value = 0.028). First-year preclinical and fourth-year clinical students reported significantly higher stress levels (29.76, SD = 5.57, and 29.15, SD = 4.41, respectively) compared to other grades (p value = 0.015). Furthermore, participants with multiple training sessions on COVID-19 had higher mean coping strategies scores (9.95, SD = 0.91) than those with fewer or no training sessions (p-value <0.001). Students engaged in clinical activities reported significantly higher coping strategies (10.10, SD = 0.87), compared to those without clinical activities (9.63, SD = 1.03) (p-value = 0.005).

We also asked student from Indonesia and Vietnam to give their opinions regarding their COVID-19 learning experience due to the abrupt shift to online courses (Table 2). The results varied between the two countries, indicating that Indonesian and Vietnamese dental students perceived their COVID-19 learning experience differently ($p < 0.05$). The impact of COVID-19 on dental education was significantly correlated with stress levels in both Indonesian ($r = 0.342$, $p < 0.001$) and Vietnamese students ($r = 0.298$, $p < 0.001$). Concerns about graduating on time were also a significant stress factor for both groups (Indonesia: $r = 0.185$, $p < 0.001$; Vietnam: $r = 0.175$, $p < 0.05$). COVID-19-related stress showed strong correlations with stress levels in both countries (Indonesia: $r = 0.400$, $p < 0.001$; Vietnam: $r = 0.491$, $p < 0.001$).

For coping strategies, perceived faculty support (Indonesia: $r = 0.248$; Vietnam: $r = 0.190$), peer support (Indonesia: $r = 0.276$), and family support (Indonesia: $r = 0.315$; Vietnam: $r = 0.193$) were significant. Additionally, the impact of COVID-19 on education (Vietnam: $r = 0.172$), concerns about graduating on time (Vietnam: $r = 0.191$), and COVID-19-related changes (Vietnam: $r = 0.395$) also significantly influenced coping strategies. These insights highlight the complex interplay between various factors in students' experiences during the pandemic, underscoring the different ways students from Indonesia and Vietnam responded to the challenges posed by COVID-19.

4. Discussion

The COVID-19 pandemic forced significant changes in dental education, which shifted away from traditional face-to-face teaching methods—such as collaborative learning, question-based learning, lectures and tutorials, problem-based learning interactions, simulated training courses, and clinical skills training—to online distance learning [7,21]. This sudden transformation affected dental students worldwide, including those in Indonesia and Vietnam [14,15,18,21,22]. This study was conducted during a wave of COVID-19 outbreaks in 2022, as students in Indonesia and Vietnam were gradually returning to their universities. To form a representative sample, all dental students from the University of Indonesia and Can Tho University, Vietnam were invited to participate in this study; 304 students completed the self-administered online questionnaire (for a response rate of 24.9 %). Of the sample, 167 respondents were from Indonesia (54.9 %), and 137 came from Vietnam (45.1 %).

Benefiting from the earlier relaxation of national-level restrictions, the Vietnamese students reported lower stress levels and healthier coping strategies than the Indonesian students. They might have returned to their universities with a sense of relative normalcy compared to the Indonesian students, who suffered higher stress levels and had to develop coping strategies over a longer timeframe. These findings underline how the duration of the restrictions and the ensuing return to normalcy significantly influenced perceived stress and coping mechanisms. Notably, the dental students demonstrated better coping strategies over time as the pandemic continued, perhaps due to the increased training, highlighting their resilience and ability to manage stress under prolonged adverse conditions [21,23].

Since the first infection in January 2020, Vietnam has seen multiple COVID-19 outbreaks, causing continuous shifts between online and offline learning that have affected teaching and learning. On May 3, 2021, Vietnam issued Government Decision 749 on the National Digital Transformation Program, and the Ministry of Education and Training permitted all higher education institutions to offer up to 30 % of their curriculum online [24]. In Indonesia, higher education institutions also implemented adaptive measures. As the COVID-19 pandemic worsened before it improved, universities collaborated with all levels of government, the commercial sector, and civil society to deliver crucial medical supplies, support the national COVID-19 public health response, and implement social limitations and physical distancing in the learning process [25].

Online learning can be carried out in two ways: synchronously through an interactive environment—for example, by teaching

online theory and practical classes—and asynchronously, where students interact with educational materials and teachers on their own schedule, for instance, through prerecorded video, audio, or text lessons [26]. In Vietnam, educators also taught online through social networks such as Zalo and Facebook [27]. At the University of Indonesia, classes, discussions, and tests were moved fully online, using internet tools such as Microsoft Teams, Google Meets, Zoom, and the university website [21]. This sudden shift from conventional to online learning introduced many challenges, such as internet disruptions, limited social interactions, motivation issues, stress, and difficulties staying connected with teachers [14,18,21].

Although the difference was not statistically significant, this study found that the fourth-year students (first-year clinical students) faced higher stress. Clinical students may have higher stress levels due to their fear of failing to complete clinical requirements, criticism from supervisors, and the responsibility for ensuring comprehensive patient care [22]. The higher stress may reflect their fear of the uncertainty they experience while adapting to their new role as clinical students. A similar pattern was found in a study conducted in Norway, which revealed that fourth-year students scheduled to undergo a significant amount of clinical training were interrupted by the pandemic. Such interruptions can lead to financial concerns because more time is needed to finish the student's studies. In addition, fourth-year students are more concerned about graduating and the challenges of starting as an inexperienced dentist [13]. Previous study also showed that females reported significantly more anxiety about contracting COVID-19, exam challenges, and loss of manual dexterity skills [14]. Male students, having completed more dental coursework, and perceiving a smoother transition were associated with lower PSS scores [18].

Along with higher stress levels, each student developed coping mechanisms to face everyday obstacles. Different individuals use different coping techniques to reduce psychological and physiological stress after uncomfortable events. The most common coping strategy among students during the pandemic was emotion-focused coping, with most of them reaching out to family and friends for emotional support. This was followed by avoidant strategies and problem-focused coping through seeking assistance from faculty and staff. These strategies likely helped them manage their stress more effectively, as they provided emotional relief, a sense of community, and practical support, reducing feelings of isolation and anxiety [28]. Also face-to-face interaction and blended learning modes proven to lower the stress-level among students [14]. Understanding an individual's unique coping methods can help customize psychological treatment to reduce psychosocial symptoms. This research may contribute to the ongoing discourse on post-pandemic educational transformations and student resilience. As previous study also showed that faculty support mediated the relationship between smooth transition and concerns about academic progress and PSS scores, faculty should facilitate mental health support for dental students [18].

The modification of the questionnaire language for the Vietnamese students represents a strength of this study, as it demonstrates sensitivity to cultural and linguistic differences. However, the study's limitations, including the skewed ratio of male and female students, potentially impact the generalizability of the gender-related findings. The use of self-report questionnaires also introduces a risk of reporting bias, recall bias, and potential dishonesty in responses, as students seek to give socially desirable answers. The cross-sectional design limits the ability to establish causation between the independent and dependent variables.

In addition, certain factors may have affected stress levels and coping strategies differently in the two countries, such as differences in remote learning environments and academic workload [19,23,24]. Varying personal circumstances, access to resources, and social support among individuals may also affect how they coped with the COVID-19 pandemic [8,10]. Thus, the results must be carefully interpreted. Additionally, the use of a non-probability convenience sampling method and the restriction of data collection to a single university from each country restricts the study's generalizability to the broader population. Despite these limitations, the study's examination of stress and coping strategies during the COVID-19 pandemic, along with its consideration of differences in stressors and strategies, contributes valuable insights to the field of dental education and student well-being.

5. Conclusion

This research explored the multifaceted impact of the COVID-19 pandemic on dental education by examining stress levels and coping strategies among students in Indonesia and Vietnam. The significant differences between the two countries in terms of stress experiences and coping strategies highlight the need for tailored therapeutic responses. Overall, we found that the dental students experienced moderate stress, and higher stress levels were associated with year of entry and living arrangements. Rougher transitions between learning formats and the expression of greater concern were closely linked to higher stress levels. Conversely, seeking social support from faculty, family, friends, and student peers was one of the best strategies deployed by students to cope with and minimize stress levels.

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Institutional review board statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of the Faculty of Dentistry, Universitas Indonesia (protocol No. 010710822; August 8th, 2022)

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Data availability statement

The raw data are not publicly available due to ethical restrictions but are available from the authors to any author who wishes to collaborate with us.

CRediT authorship contribution statement

Risqa Rina Darwita: Writing – original draft, Supervision, Project administration, Investigation, Funding acquisition, Data curation, Conceptualization. **Putri Adelia Savitri:** Writing – original draft, Project administration, Formal analysis, Data curation. **Safira Khairinisa:** Writing – review & editing, Methodology, Formal analysis. **Atik Ramadhani:** Validation, Supervision, Methodology. **Mellisa Adiatman:** Supervision, Methodology, Formal analysis. **Diah Ayu Maharani:** Writing – review & editing, Supervision. **Thao Thi Do:** Supervision, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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