

# Prevalence of stress and related factors among healthcare students: a cross – sectional study in Can Tho City, Vietnam

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*Keywords:* Stress levels; healthcare students; related factors; cross-sectional study; Vietnam  
*Parole chiave:* Livello di stress; studenti di laurea sanitarie; studio trasversale; Vietnam

## Abstract

**Background.** Stress is a major public health issue that can impact both physical and mental well-being. It is prevalent in many areas of modern life, including education. Healthcare students are at a high risk of experiencing stress due to the unique demands of their fields of study.

**Study design and methods.** An online survey was conducted on 2,515 undergraduate students pursuing degrees in medicine, preventive medicine, pharmacy, and nursing at Can Tho University of Medicine and Pharmacy in Can Tho City, Vietnam.

**Results.** Using the Perceived Stress Scale-10 (PSS-10), it was found that 35.2% of students reported mild stress, 62.7% had moderate stress, and only 2.1% experienced severe stress. Multivariable logistic regression analysis revealed nine significant factors associated with students' stress levels ( $p \leq 0.05$ ). Particularly, medicine students exhibited a significantly higher level of moderate and severe stress (95% CI = 1.22-2.01), 1.57 times higher than preventive medicine students. Sixth-year students had a stress level 1.58 times higher (95% CI = 1.11-2.26) than first-year students. Students achieving excellent and very good academic

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performances in the last semester had a stress level 1.60 times higher (95% CI = 1.16-2.22) than students with average and lower academic performance. Students living at home had a stress level 1.73 times higher (95% CI = 1.05-2.84) than students living in their relatives' houses. Students who rarely or never had a part-time job during academic years had a stress level 1.70 times higher (95% CI = 1.31-2.20) than those who often or sometimes had a part-time job. Students with a family history of smoking addiction had a stress level 1.69 times higher (95% CI = 1.28-2.22) than students without such a family history. Students who rarely or never received concern and sharing from family had a stress level 7.41 times higher (95% CI = 5.07-10.84) than students who often or sometimes received concern and sharing from family. Students who were often or sometimes cursed by family had a stress level 2.04 times higher (95% CI = 1.09-3.81) than students who were rarely or never cursed by family. Students without close friends had a stress level 1.46 times higher (95% CI = 1.11-1.91) than students with close friends.

**Conclusions.** The rates of mild and moderate stress levels were significantly higher than severe stress level among healthcare students. Research has provided scientific findings as the basis for determining risk factors and imposing solutions that aim to reduce the rate of stress in students. Therefore, it helps students overcome difficulties and enhance their physical and mental health.

## Introduction

Stress, a physiological and psychological response to life's changes and challenges (1, 2), can lead to disruptions in bodily functions, the emergence of symptoms, and the development of chronic and long-term diseases if the body fails to adapt and restore balance (3). High levels of stress are strongly linked to poor mental well-being, lower academic performance, increased mental health issues, and reduced quality of life (4, 5). Stress has become a prevalent issue that requires attention in daily life. Students are particularly vulnerable to psychological problems, due to the pressures of studying, exams, concerns about living conditions, economic constraints, and relationships (5-7). Moreover, students often lack the experience to effectively cope with challenging situations (8), increasing stress levels, especially among those pursuing healthcare-related majors. Previous research worldwide has consistently shown that healthcare students experience higher levels of stress compared to others (9-12). Studies have indicated that gender, academic year, academic pressure, expectations, academic results, social relationships (including romantic conflicts and conflicts with friends and parents), extracurricular activities, financial difficulties, changes in sleep patterns, and changes in the environment are associated with stress in healthcare students (13, 14).

In the contemporary scientific research, various tools are commonly used to assess mental health, with the Perceived Stress Scale (PSS-10), Assessment of Stress (GHO-12), Lovibond's assessment of stress, anxiety, and depression (DASS-21, DASS-42) being prominent examples. Mental health issues are increasingly being studied in Vietnam, and for

assessing the mental well-being of students, the Perceived Stress Scale (PSS-10) is often employed. The PSS-10, developed by Cohen and co-authors in 1983, is considered one of the most reliable and valid scales, with a Cronbach alpha value of 0.85 (15). This scale does not provide a diagnostic meaning according to the ICD-10 classification guideline but aims to reflect the stress levels within the surveyed population, laying the groundwork for implementing effective strategies to enhance spiritual well-being. The PSS-10 scale has been adapted and utilized across different populations and translated into more than 20 languages, showing good validity and reliability in languages such as Greek, Arabic, and Italian (15, 16). Additionally, the PSS-10 scale exhibits high reliability and can be used to assess the impact of life events. In some Vietnamese studies, Tran Tiet Hanh Dao et al. reported a Cronbach alpha reliability coefficient of 0.80 (17).

Healthcare disciplines are known for their demanding nature, requiring students to master extensive knowledge and professional practice (2, 12, 18). Moreover, undergraduate healthcare students often face academic pressure during their training program (19). The fields of medicine and pharmacy involve substantial knowledge, and the duration of study is relatively long and continuous (18, 20). The medical curriculum is considered a stressor since its characteristics lead to several psychological transformations (21). Healthcare students spend considerable time in lecture halls and healthcare facilities for practice, leading to heightened academic pressure and examination stress (22). Additionally, living away from home and becoming independent can present challenges in their personal lives (23, 24). In conclusion, the academic and cultural environment, combined with complex relationships, can trigger

difficulties in adapting to university life (22). Due to the escalating stress levels among healthcare students, our research aimed to investigate stress and related factors. Effective interventions are crucial to support students in handling difficulties, reducing the risk of mental disorders, and promoting physical and mental health development.

## Materials and Methods

### 1. Study Design and Population

The research was designed as a cross-sectional descriptive study with data collected from February 2020 to May 2020, especially avoiding the final examination period. Data was collected in the initial period of the semester, which may not fully explain the current increase in stress levels. However, the global spread of COVID-19 pandemic was occurring during the data collection time. All medical students engaged in online and offline training courses covering various approaches to COVID-19 prevention and treatment since early March 2020 at Can Tho University of Medicine and Pharmacy. When the outbreak worsened, students could aid the front-line medical officers. Due to students' perceived obligations and social expectations, healthcare students may experience significant levels of stress. The main objective was to assess the stress levels in students. Random sampling was employed to select participants from the healthcare disciplines of medicine, preventive medicine, pharmacy, and nursing at Can Tho University of Medicine and Pharmacy. The undergraduate students majoring in medicine, preventive medicine, pharmacy, and nursing at Can Tho University of Medicine and Pharmacy met the inclusion requirements and consented to engage in this investigation. The exclusion criteria were students postponing their academic programs at the time of sample collection. Furthermore, respondents who failed to complete a set of questionnaires after receiving three invitations were excluded from the study.

### 2. Data Instruments and Collection

The questionnaire to be self-completed was divided into two sections: socio-demographic characteristics and the PSS-10 scale. The PSS-10 scale was used to assess the levels of stress among healthcare students. Investigators explained the study's purpose and content before sending a link to the questionnaire via email. Collectors guided and assisted students during the completion process.

The PSS-10 measures participants' perceptions of stress in their lives. It consists of ten items that refer to the thoughts and emotions of healthcare students over the past month. Response options include 0-Never, 1-Rarely, 2-Sometimes, 3-Often, and 4-Very often. Questions 1, 2, 3, 6, 9, and 10 are scored as follows: 0 = 0 point, 1 = 1 point, 2 = 2 points, 3 = 3 points, and 4 = 4 points. Questions 4, 5, 7, and 8 are positive and scored in reverse: 0 = 4 points, 1 = 3 points, 2 = 2 points, 3 = 1 point, and 4 = 0 point. Stress levels are determined by the total score of all questions. Higher scores indicate more severe stress levels. The total score is used to categorize stress levels as mild (0-13 points), moderate (14-26 points), or severe (27-40 points). The PSS-10 scale was developed by Cohen et al. in 1983 and has a Cronbach alpha reliability coefficient of 0.850 (15). In our study, Cronbach's alpha for this sample was 0.777, indicating an acceptable reliability.

The survey used convenience sampling via Google Form. Invitations were sent to all students majoring in medicine, preventive medicine, pharmacy, and nursing. The link to the online study was sent through the university's email system and reminder emails were sent at least three times during the collection period to increase response rates.

### 3. Data Analysis

Data was coded using Excel 2019 and analyzed with SPSS 24.0. Descriptive statistics were used to present the proportion and frequency of qualitative variables, such as socio-demographic information and stress levels. The Chi-square test ( $\chi^2$ ) and Fisher's Exact Test were used to identify factors related to stress in undergraduate students. The Cronbach alpha coefficient was calculated to assess the internal consistency of the PSS-10 scale.

In the univariate variable analysis, factors with  $p \leq 0.10$  were selected for inclusion in the multivariable logistic analysis using the Backward Wald method. This model aimed to exclude confounding variables and identify significantly associated factors. These factors included gender, ethnicity, living status, pre-university accommodation, current accommodation during study, major, academic year, academic performance in the last semester, part-time job status, participation in art, family history of fatal diseases, family history of mental illnesses, family history of drug addiction, family history of smoking addiction, support from friends and family, being cursed by family members, having close friends, and relationships with neighbors. All these factors were included in the multivariable regression analysis, with a  $p$ -value  $\leq 0.05$  considered statistically significant.

#### 4. Ethical Considerations

The study was approved in the research proposal review of Can Tho University of Medicine and Pharmacy (No. 2715/QĐ.ĐHYDCT dated December 31, 2019). All students were informed about the research's purpose and content, which were free to participate or decline participation for any reason. All students' information was kept confidential and used only for the purpose of the study. Data access was restricted to researchers. The questionnaire did not include any private or sensitive questions that could affect participants' psychology or the outcome of the study. The time required to complete the questionnaire was relatively short and did not interfere with students' studies.

## Results

The total number of students in these disciplines at the university was 7,278. Questionnaires were distributed to all eligible undergraduate students, and

2,667 students completed the survey, resulting in a response rate of 36.64%. Eventually, the final sample size for the research was 2,515. Of the 2,515 students who participated in the survey, 40.3% (n = 1,014) were male and 59.7% (n = 1,501) were female, with a mean age of 21.37 ( $\pm$  2.09). The majority of participants, 86.2% (n = 2,169), were of the Kinh ethnicity. The most common major was medicine, representing 65.8% (n = 1,654) of students, while nursing had the lowest representation at 8.0% (n = 201). The proportions of students majoring in preventive medicine and pharmacy were 14.3% (n = 360) and 11.9% (n = 300), respectively. The rates of second and fifth-year students were nearly equal, at 21.7% (n = 546) and 20.1% (n = 505), respectively, while sixth-year students had the lowest representation at 9.7% (n = 245). The mean semester GPA on a 4-point scale was 2.88 ( $\pm$  0.38). The highest percentage of students had good academic results (n = 1,682, 66.8%), while the lowest percentage had excellent results (n = 76, 3.0%) (Table 1).

Table 1 - Demographic characteristics of healthcare students (n=2,515)

Characteristics		Frequency (n)	Percentage (%)
Gender	Males	1014	40.3
	Females	1501	59.7
Age (years)	18-20	1013	40.3
	21-23	1066	42.4
	$\geq$ 24	436	17.3
Ethnicity	Kinh	2169	86.2
	Hoa	94	3.7
	Khmer	179	7.2
	Others	73	2.9
Major	Medicine	1,654	65.8
	Preventive medicine	360	14.3
	Pharmacy	300	11.9
	Nursing	201	8.0
Academic year	First year	475	18.9
	Second year	546	21.7
	Third year	317	12.6
	Fourth year	427	17.0
	Fifth year	505	20.1
	Sixth year	245	9.7
Academic performance in the last year	Excellent	76	3.0
	Very good	490	19.5
	Good	1,682	66.8
	Average and lower	267	10.7
Semester GPA on 4-point scale $\pm$ standard deviation		2.88 $\pm$ 0.38	

### 1. The situation of stress in healthcare students

A survey based on the PSS-10 scale assessed students' thoughts and emotions over the past month. The items on the PSS-10 scale are shown in Table 2. The total PSS-10 scores ranged from 7 to 36, with a mean of 16.06 ( $\pm$  5.04). Of the 2,515 students surveyed, 35.1% ( $n$  = 884) had mild stress, 62.8% ( $n$  = 1,578) had moderate stress, and 2.1% ( $n$  = 53) had severe stress (Table 2).

### 2. Associations with levels of stress in healthcare students

In the analysis, both at the bivariate level and after adjusting for all confounders in the multiple logistic regression, several factors were found to be significantly associated with stress levels. These factors included major ( $p$  < 0.001), academic year ( $p$  = .0011), academic performance in the last semester ( $p$  = 0.005), current accommodation during study ( $p$  = 0.031), having a part-time job during study ( $p$  < 0.001), family history of smoking addiction ( $p$  < 0.001), concern and sharing from family ( $p$  < 0.001), being cursed by family ( $p$  = 0.025), and having close friends ( $p$  = 0.007). Specifically, medicine students exhibited a significantly higher level of moderate and severe stress (95% CI = 1.22-2.01), which was 1.57 times higher than preventive medicine students. Similarly, sixth-year students had a 1.58 times higher level of stress (95% CI = 1.11-2.26) compared to first-year students. Moreover, students who achieved excellent and very good academic performance in the last

semester had a 1.60 times higher stress level (95% CI = 1.16-2.22) than those with average and lower academic performance. Regarding living arrangements, students living at home had a 1.73 times higher stress level (95% CI = 1.05-2.84) than students living in their relatives' house. Additionally, students who rarely or never had a part-time job during the study experienced a 1.70 times higher stress level (95% CI = 1.31-2.20) than those who had often or sometimes engaged in a part-time job. Furthermore, students with a family history of smoking addiction had a 1.69 times higher stress level (95% CI = 1.28-2.22) than students without such a family history. Concerning family dynamics, students who rarely or never received concern and sharing from family members had a significantly higher stress level of 7.41 times (95% CI = 5.07-10.84) compared to those who often or sometimes received such support. Moreover, students who were often or sometimes cursed by family had a 2.04 times higher stress level (95% CI = 1.09-3.81) than those who were rarely or never cursed. Finally, students without close friends experienced a 1.46 times higher stress level (95% CI = 1.11-1.91) than students with close friends (Table 3).

## Discussion

Our study aimed to determine the levels of stress among undergraduate students using the PSS-10 scale, which assesses thoughts and emotions experienced by students within the past month. The total PSS-10

Table 2 - Distribution subscales of PSS-10 and levels of stress ( $n$  = 2,515)

PSS-10	Mean (SD)
<b>Items</b>	
Feeling upset because of something that happened unexpectedly	1.59 (0.78)
Not being able to control the important things in your life	1.10 (0.79)
Nervous and stressed	1.66 (0.88)
Confident about your ability to handle your personal problems	1.98 (0.95)
Things were going your way	1.88 (0.97)
Not being able to cope with all the things that you had to do	1.51 (0.75)
Being able to control irritations in your life	1.98 (0.93)
Feeling on top of things	1.89 (0.91)
Being angered because of things that were outside your control	1.38 (0.83)
Having difficulties were piling up so high that you could not overcome them	1.09 (0.93)
<b>Total scale</b>	16.06 (5.04)
<b>Levels of stress</b>	$n$ (%)
Mild (0-13)	884 (35.1)
Moderate (14-26)	1,578 (62.8)
Severe (27-40)	53 (2.1)

Table 3 - Multivariable logistic regression analysis between characteristics and stress in healthcare students (n = 2515)

Characteristics	Stress		Univariate regression		Multivariable regression	
	Moderate and Severe n (%)	Mild n (%)	OR (CI 95%)	p	aOR (CI 95%)	p
Major						
Medicine	1,095 (66.2)	559 (33.8)	1.40 (1.11-1.77)	<b>0.005</b>	1.57 (1.22-2.01)	<b>&lt;0.001</b>
Nursing	137 (68.2)	64 (31.8)	1.53 (1.06-2.20)	<b>0.022</b>	1.19 (0.80-1.79)	0.394
Pharmacy	189 (63.0)	111 (37.0)	1.22 (0.89-1.67)	0.222	1.01 (0.72-1.42)	0.957
Preventive medicine	210 (58.3)	150 (41.7)	1	-	1	-
Academic year						
First year	300 (63.2)	175 (36.8)	1	-	1	-
Second year	367 (67.2)	179 (32.8)	1.20 (0.92-1.55)	0.174	1.20 (0.92-1.58)	0.181
Third year	205 (64.7)	112 (35.3)	1.07 (0.79-1.44)	0.665	1.04 (0.76-1.42)	0.820
Fourth year	273 (63.9)	154 (36.1)	1.03 (0.79-1.36)	0.809	0.99 (0.74-1.33)	0.961
Fifth year	311 (61.6)	194 (38.4)	0.94 (0.72-1.21)	0.611	0.89 (0.68-1.18)	0.428
Sixth year	175 (71.4)	70 (28.6)	1.46 (1.04-2.04)	<b>0.027</b>	1.58 (1.11-2.26)	<b>0.011</b>
Academic performance in the last semester						
Excellent and very good	391 (69.1)	175 (30.9)	1.38 (1.02-1.87)	<b>0.038</b>	1.60 (1.16-2.22)	<b>0.005</b>
Good	1,075 (63.9)	607 (36.1)	1.10 (0.84-1.43)	0.505	1.22 (0.92-1.62)	0.172
Average and lower	165 (61.8)	102 (38.2)	1	-	1	-
Current accommodation during study						
Hostel	1,342 (63.9)	759 (36.1)	1.08 (0.72-1.64)	0.703	1.10 (0.71-1.70)	0.667
Home	227 (72.3)	87 (27.7)	1.60 (1.0-2.57)	0.052	1.73 (1.05-2.84)	<b>0.031</b>
Relatives' house	62 (62.0)	38 (38.0)	1	-	1	-
Having a part-time job during study						
Rarely and never	1,458 (66.3)	742 (33.7)	1.61 (1.27-2.05)	<b>&lt;0.001</b>	1.70 (1.31-2.20)	<b>&lt;0.001</b>
Often and sometimes	173 (54.9)	142 (45.1)	1	-	1	-
The family history of about smoking addiction						
Yes	257 (74.9)	86 (25.1)	1.74 (1.34-2.25)	<b>&lt;0.001</b>	1.69 (1.28-2.22)	<b>&lt;0.001</b>
No	1,374 (63.3)	798 (36.7)	1	-	1	-
Concern and sharing from family						
Rarely and never	320 (90.4)	34 (9.6)	6.10 (4.24-8.78)	<b>&lt;0.001</b>	7.41 (5.07-10.84)	<b>&lt;0.001</b>
Often and sometimes	1,311 (60.7)	850 (39.3)	1	-	1	-
Being cursed by family						
Often and sometimes	56 (80.0)	14 (20.0)	2.21 (1.22-3.99)	<b>0.007</b>	2.04 (1.09-3.81)	<b>0.025</b>
Rarely and never	1,575 (64.4)	870 (35.6)	1	-	1	-
Having close friends						
No	278 (74.5)	95 (25.5)	1.71 (1.33-2.19)	<b>&lt;0.001</b>	1.46 (1.11-1.91)	<b>0.007</b>
Yes	1,353 (63.2)	789 (36.8)	1	-	1	-

scores ranged from 7 to 36, and the mean PSS-10 score (SD) among undergraduate students in our study was 16.06 (5.04) (Table 2). This result was comparable to previous studies conducted by Drachev et al (22) and Anwer et al (23), where the mean PSS-10 scores were 16.6 and 16.16, respectively, in Russian and Saudi students. However, our mean score was lower than that found in students of Malaysia (19.51) (24), and Korea (18.6) (25), but higher than that reported in Thailand (13.53) (26).

COVID-19 was formally classified as a worldwide pandemic on March 11, 2020 (25). During the initial period of pandemic, the first COVID-19 case in Vietnam was documented on January 22, 2020 (26). It was demonstrated that the COVID-19 pandemic negatively affected the healthy population's psychological well-being (27, 28). Out of the 2,515 undergraduate students surveyed, the majority exhibited moderate perceived stress, with 35.1% (n = 884) reporting mild stress, 62.8% (n = 1,578) experiencing medium stress, and 2.1% (n = 53) indicating high stress (Table 3). The levels of stress reported in our research are similar to the results by Thai et al (28) during COVID-19 pandemic. Particularly, the highest percentage of perceived stress among public health and preventive medicine students in Ho Chi Minh City, Vietnam, was moderate stress level, involved 81.3%, followed by 17.1% with low stress, and the lowest percentage of perceived stress was 1.6% with high stress (28). These results explain that our research and that by Thai et al have similarities in healthcare students, places of study as the two largest universities of medicine and pharmacy in the Southern of Vietnam, and the time of data collection in the first stage of COVID-19 pandemic. Moreover, this finding aligns with the results of Nivetha et al in India (29), where 74% of moderate stress occupied the highest percentage, followed by 20% with mild stress, and only 6% with severe stress. These results differed from those of Turkish students, where the percentage of low, medium, and high stress were 5.6%, 23%, and 71.2%, respectively (30), and a study in Poland where the rates were 11.03%, 22.06%, and 66.91%, respectively (31). Another study by Abdulghani et al in Saudi Arabia (21) reported that students experiencing mild, moderate, and severe stress were 20.4%, 18.2%, and 25%, respectively. The variations in stress levels may be attributed to differences in educational environment, curricula, regional socio-cultural factors, and distinct geographical regions (32).

Notably, stress has emerged as a significant health concern among undergraduate students, especially those in healthcare-related majors (9, 22). The

intensive curriculum of medicine and pharmacy, the academic load, along the extended duration of education, contribute to the higher stress levels experienced by healthcare students (22, 24, 33). Our study highlighted that sixth-year students and those without close friends were at higher risk of moderate and severe stress levels (Table 3). This result explains that sixth-year students faced academic pressures, including a heavy workload, anxiety about academic performance, and frequent examinations. Therefore, implementing effective stress management strategies and providing support during the university years, especially for sixth-year students, is crucial. Our findings align with research conducted in Pakistan, indicating a significant association between academic performance and stress (34). A survey at an Israel university showed that the most common causes of stress reported in all medical programs were academic-related factors (33). However, this was in contrast to the results of Anuradha et al (20) and Borkakoty et al (35), in which accommodation away from home ( $p < 0.001$ ) was a crucial environmental stressor that was deemed a significant predictor of stress. An Italian study reported that having a part-time job out of necessity was associated with a higher level of perceived stress (36).

Family relationships were also a significant factor influencing stress levels among students (22, 36). Our study unveiled that family relationships were a significant contributor to moderate and severe stress levels. In particular, students who received rare or no concern and sharing from family members had substantially higher stress levels compared to those who received regular support (Table 3). This finding aligns with previous research, including a study by Xian et al. in China, which also demonstrated a correlation between family support and stress (37). Family support, including sharing about challenges and providing emotional and material resources, plays a crucial role in students' stress management (22, 36). Research in Spain revealed that problematic communication among family members was a notable risk factor for the manifestation of verbally aggressive behavior, which was directly and indirectly linked to perceived stress. Participants who faced interactive issues with their parents reported higher stress levels and described experiencing verbal aggression (38). Therefore, establishing counseling units and fostering strong family support in the educational environment are essential to assist students in coping with stress (24, 38).

Factors like gender, ethnicity, living status, accommodation before attending university,

participating in art courses, family history of certain diseases or mental illnesses, family history of drug addiction, and relationships with neighbors were not significantly related to stress levels in our survey. These findings align with previous research conducted among undergraduate students at medical colleges in India and Saudi Arabia (29, 35, 39). Stress assessment remains subjective and may vary at different times. Our study sheds light on the significance of addressing stress not only among students but also within family dynamics (Table 3). Effective interventions and support systems, including the involvement of professors in consultation clinics, are crucial in universities to ensure students' well-being and academic success in the future (24).

### Strengths and Limitations of the study

Research on stress among healthcare students in Vietnam has been limited. However, our study provides valuable insights with a large sample of 2,515 students representing four majors across all academic years (medicine, preventive medicine, pharmacy, and nursing). The utilization of the PSS-10 scale, which has demonstrated a high Cronbach's alpha (0.777) and a coefficient of correlation of total variables greater than 0.30, ensures the reliability of our findings. The questionnaires used in the study are easy to comprehend, enabling students to provide their perceptions accurately.

Despite contributing new scientific information about stress among undergraduate students, our research does have certain limitations. Firstly, it adopted a cross-sectional design, which only assesses stress at a specific time during the student's academic period. Collecting data took place during the the first stage of COVID-19 pandemic, so the percentage of high and moderate levels of stress may be increased. Long-term research would be needed to explore the continuous and extensive correlation between dependent and independent variables related to stress. Secondly, while the PSS-10 scale is effective for screening stress, future investigations should involve specialized professionals in diagnosing psychological disorders and providing timely treatment. Furthermore, the data collection method relying on self-completed questionnaires may have introduced errors. To address this, future studies could consider incorporating in-depth interviews and observations to enhance data accuracy and control potential errors. This would provide more comprehensive and detailed insights into stress among healthcare students.

Overall, our study represents a significant step in understanding stress among undergraduate healthcare students in Vietnam. It underscores the importance of further research efforts to gain a deeper understanding of the factors contributing to stress and to develop effective interventions for promoting mental well-being among students.

### Conclusions

Our findings indicate a relatively high proportion of moderate stress among the participants. However, special attention should be given to medicine students, sixth-year students, those with excellent and good academic performance in the last semester, those living at home, those who rarely or never have a part-time job, individuals with a family history of smoking addiction, those who rarely or never receive concern from family, those who sometimes or often experience family conflicts, and students without close friends. These factors were significantly associated with moderate and severe stress levels. These results provide valuable insights for planning, organizing, and implementing support practices within family, university, and society. Addressing these psychological difficulties can help students overcome stress, improve academic performance, and enhance their overall quality of life.

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**Data Availability Statement:** The data used to support the findings of this study are included within the article.

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**Compliance with Ethical Standards:** The research protocol was approved by the Ethics Committee of Can Tho University of Medicine and Pharmacy in Can Tho City, Vietnam. Participation in the study was voluntary and all respondents were informed.

**Conflict of interest:** The authors determined that the study was free from such conflicts.

### Riassunto

*Prevalenza dello stress e dei fattori ad esso associati tra gli studenti delle lauree sanitarie: un'indagine trasversale nell'università di Can Tho, Vietnam*

**Premessa.** Lo stress è un grave problema di sanità pubblica che può avere conseguenze sul benessere fisico e mentale. Ha una



notevole prevalenza in molti ambiti della vita moderna, compresa l'istruzione. Gli studenti del settore sanitario corrono un rischio elevato di sperimentare stress a causa delle esigenze specifiche del loro campo di studi.

**Progettazione e metodi dello studio.** È stato condotto un sondaggio online tra 2.515 studenti universitari di medicina, medicina preventiva, farmacia e infermieristica nella Facoltà di Medicina e Farmacia dell'Università di Can Tho, Vietnam.

**Risultati.** Utilizzando la scala dello stress percepito-10 (PSS-10), è stato riscontrato che il 35,2% degli studenti ha riportato uno stress lieve, il 62,7% uno stress moderato e solo il 2,1% uno stress grave. L'analisi di regressione logistica multivariata ha rivelato nove fattori significativi associati ai livelli di stress degli studenti ( $p \leq 0,05$ ). Nel dettaglio, quelli di medicina hanno mostrato un livello significativamente più elevato di stress moderato e grave (IC 95% = 1,22-2,01), 1,57 volte superiore rispetto agli studenti di medicina preventiva. Gli studenti del sesto anno avevano un livello di stress 1,58 volte superiore (IC 95% = 1,11-2,26) rispetto agli studenti del primo anno. Gli studenti che hanno ottenuto risultati accademici eccellenti o molto buoni nell'ultimo semestre avevano un livello di stress 1,60 volte superiore (IC 95% = 1,16-2,22) rispetto agli studenti con risultati accademici medi e inferiori. Gli studenti che vivevano a casa avevano un livello di stress 1,73 volte più alto (IC 95% = 1,05-2,84) rispetto agli studenti che vivevano a casa dei loro parenti. Gli studenti che raramente o mai hanno svolto un lavoro part-time durante gli anni accademici mostravano un livello di stress 1,70 volte più alto (IC 95% = 1,31-2,20) rispetto a quelli che avevano spesso o qualche volta un lavoro part-time. Gli studenti con una storia familiare di dipendenza dal fumo avevano un livello di stress 1,69 volte più alto (IC 95% = 1,28-2,22) rispetto agli studenti senza tale storia familiare. Gli studenti che raramente o mai hanno avuto interazioni con la famiglia avevano un livello di stress 7,41 volte più alto (IC 95% = 5,07-10,84) rispetto agli studenti che spesso o a volte avevano avuto questa interazione. Gli studenti che avevano avuto spesso o talvolta cattivi rapporti con la famiglia avevano un livello di stress 2,04 volte più alto (IC 95% = 1,09-3,81) rispetto agli studenti che non avevano abitualmente o sovente questi cattivi rapporti. Gli studenti senza amici intimi avevano un livello di stress 1,46 volte più alto (IC 95% = 1,11-1,91) rispetto agli studenti con amici intimi.

**Conclusioni.** La frequenza di livelli di stress lievi e moderati era significativamente più elevata di quella del livello di stress grave tra gli studenti di sanità. I risultati della ricerca hanno fornito una base scientifica per determinare i fattori di rischio e proporre soluzioni che mirano a ridurre il tasso di stress negli studenti. Pertanto, può aiutare gli studenti a superare le difficoltà e a migliorare la loro salute fisica e mentale.

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