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Original Research Article

Stress Levels among Undergraduate Nursing Students in Relation to Demographic Factors at Tra Vinh University, Vietnam, 2023

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Abstract: The mental health of nursing students is increasingly recognized as a critical issue, particularly given the high demands of their educational and clinical training. This study evaluates the prevalence and severity of stress among 94 nursing students, revealing a significant incidence of stress with potentially serious implications for health. According to the World Health Organization, optimal mental health enables individuals to manage life's normal stresses and contribute positively to their communities. However, when stress becomes pathological, it can severely impact life balance and health, leading to conditions such as anxiety and depression. Our findings show that 38.3% of nursing students experience stress, with 61.7% exhibiting symptoms of stress and 35.1% facing mild pathological stress. Notably, severe pathological stress necessitating medical intervention was observed in 3.2% of the cohort. The average stress score was 21.2 ± 4.4, indicating a substantial risk of stress progression from normal to mild pathological levels. Demographic analysis revealed no significant differences in stress prevalence based on gender, age, or ethnicity. Living arrangements and economic status did not significantly influence stress rates. These findings underscore the urgent need for targeted interventions to mitigate stress and its detrimental effects on nursing students, potentially enhancing their educational outcomes and long-term mental health.

Keywords: Nursing Students, Stress Prevalence, Mental Health, Pathological Stress, Demographic Factors.

BACKGROUND OF THE STUDY

The World Health Organization has defined mental health as a state in which each individual realizes their own abilities, can cope with the normal stresses of life, can work productively, and is able to contribute to their community (WHO, 2003). When encountering stressful situations, the body reacts to stressors to adapt, and if unable to adapt, stress becomes pathological (Hans, 1946). Stress can disrupt the balance in one's life, leading to health issues such as exhaustion, anxiety, and depression, which impact the quality of life of individuals and society (Do NNT, 2008).

With rapid changes in living conditions, the prevalence of stress is increasing, becoming a common mental health issue that can be encountered everywhere, in every profession, and at any age (Hans, 1976). Stress among students can arise from various causes, often related to academics, social relationships, and financial issues. In fact, medical and pharmacy students are among the groups at the highest risk of stress. Compared to other majors, these fields have extensive curricula requiring students to grasp both theory and regular practice (Nguyen BN & Nguyen VT, 2020). Additionally, the unique nature of medical training involves learning in multiple settings; besides classroom learning, students also engage in clinical practice and night shifts at hospitals, which may lead to increasing stress levels, particularly among final-year nursing students who juggle studies, practical training, and preparations for graduation, along with family pressures and post-graduation employment concerns (Nguyen TTT, 2020).

LITERATURE REVIEW

According to Nola Pender, health promotion is defined as behavior motivated by the desire to enhance happiness and realize human health potential, this approach to health care encompasses three aspects:

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physical, mental, and social. Conversely, health protection or disease prevention actively promotes factors that impact health, including individual, biological, psychological, and socio-cultural factors (Cooper, 2014). The health promotion model acknowledges that each individual's unique characteristics influence their actions. Nursing students face not only academic stress but also workplace stress during their training. Common stressors include time pressure, workload, decision-making, constant changes, and economic mistakes at work. Stress is a psychological factor affecting the performance and welfare of nursing students (Sawatzky, 1998). This has led to the development of extensive research aimed at identifying levels and sources of stress in nursing education.

Globally, the situation of stress in educational environments has been recognized as severe, particularly among medical students at universities and colleges. Various studies have indicated that stress rates among medical students range from 20-90%. In Asian countries such as India and Thailand, the rates of medical students experiencing stress are among the highest, ranging from 60-97% (Alzahem, 2013; Amr, 2008). Studies in Egypt, Brazil, and Saudi Arabia have recorded stress rates among medical and nursing students at 62.4%, 64%, and 63%, respectively (Hassan & Wahed, 2017; Barbosa, 2017; Shankar, 2007). Thus, health promotion involves recognizing the interrelation of individual factors that impact health behavior, including barriers and activities related to effective personal cognition in self-protection and health enhancement. Enhancing health behavior is the outcome of activities aimed at achieving positive health results such as happiness, optimal fulfillment, and productive life (Pender, 2012).

In Vietnam, research on nursing students has shown varying stress levels across different educational institutions. For instance, in 2020, the stress rate among students at Hai Phong Medical College was reported at 47.3% (Nguyen BN & Nguyen VT, 2020). A 2018 study by Phung Nhu Hanh and colleagues on nursing and pharmacy students revealed a stress rate of 47.6% (Pham NH & Mai TH, 2023). A survey at Dong Nai Medical College in 2013 found a stress prevalence of 23.8% (Nguyen TD, 2013). Research conducted at Hanoi Medical University in 2022 by Nguyen Trong Tai and colleagues reported a lower stress rate of 13.4% in 2023 (Tran XN & Le TT, 2008), and a survey at Hue University of Medicine and Pharmacy noted a 16.2% stress rate among nursing students (Nguyen TTTT & Le TVH, 2021). At Nam Sai Gon Polytechnic College, 37.9% of nursing and pharmacy students experienced stress, with 11.3% suffering from severe stress and 4.1% from very severe stress (Vo TNN & Nguyen VA, 2021). This study also indicated that third-year students and those in the nursing field often exhibit the highest levels of mental stress (Nguyen TTTT & Le TVH, 2021). Furthermore, other studies in the health sciences sector revealed high stress rates at Hanoi Medical University with 63.6% (Nguyen TK, 2018) and Ho Chi Minh City University of Medicine and Pharmacy with 71.4% (Tran XN & Le TT, 2008). At Can Tho University of Medicine and Pharmacy, a 2020 study by Nguyen Thi Thanh Thao found a 69.5% stress rate among students (Nguyen TTT, 2020), and Le Minh Thuan's research at the same institution showed a 77% stress rate (Le MT, 2011). A study by Le Hoang Thanh Nhung on public health students reported a stress rate of 44.5% (Doan THL & Hoang TN, 2018), while Tran Thi Hoang Yen and colleagues' 2021 study at Can Tho University noted a 78.2% stress rate among medical students (Pham TH & Tran TL, 2021). Additionally, stress is prevalent not only among students but also among healthcare workers. A 2010 survey by Do Nguyen Nhut Tran at Nhon Trach Healthcare Center in Dong Nai found that 27% of healthcare workers regularly experience stress (Do NNT, 2008), and a 2008 study by Le Thanh Tai in Can Tho Province reported a 45.2% stress rate among nurses (Nguyen TL & Nguyen MiT, 2022). The medical field is uniquely demanding, training personnel directly involved with human health and life. Consequently, medical students are required to strive continuously and excel academically. The increased stress vulnerability among medical students compared to other disciplines stems from not only theoretical studies but also intensive practical training in hospitals. This combination inevitably leads to stress, fatigue, and sleep deprivation, adversely affecting their health (Tran KT, 2012).

RESEARCH METHODOLOGY

Study Design: Cross-sectional description

Study Setting: The study was conducted at Tra Vinh University, Tra Vinh City, Vietnam. From April 2023 to June 2023.

Study Participants: The study involved final-year nursing students at Tra Vinh University.

Sample size:

$$n = Z^2_{(1-\frac{\alpha}{2})} \frac{p(1-p)}{d^2}$$

The sample size was determined using the formula for estimating a proportion, p: the estimated prevalence of stress among students at Hanoi Medical University, according to the study by Trieu Thi Dao and colleagues in 2016, which indicated a stress prevalence of 73% (Trieu TD, 2016). From this, the sample size (n) was calculated to be 94 participants. The expected margin of error was set at d = 0.09. Thus, the sample size for the study was determined to be 94 participants.

DATA COLLECTION METHODS

Structured questionnaires, known as the Perceived Stress Scale-10 (PSS-10), were used to assess stress levels among student participants. Developed in 1983 by Cohen S.K and Mermelstein (Cohen, 1983), this

scale consists of 10 questions, each with five response options ranging from 0 (never) to 4 (very often). The minimum score on the scale is 0, and the maximum is 40, with higher scores indicating higher levels of perceived stress. The PSS-10 has been validated with a high reliability, showing a Cronbach's Alpha of 0.85. This scale has been translated into Vietnamese and utilized in various studies within Vietnam (Trieu TD, 2016). In our study, the Cronbach's Alpha was calculated to be 0.735.

Statistical Analysis

The data was entered, verified and cleaned, using Epidata spread and the data analysis was done using STATA. Continuous variables were summarized by medians and interquartile ranges, and categorical variables were summarized by frequency and percentage.

Consent to Participate

The research data are solely for the purpose of study and are not intended for any other use. The study was conducted after receiving approval from the Tra Vinh University, based on decision number 3349/QĐ-ĐHTV. All participants were clearly informed about the purpose of the research and voluntarily consented to participate. Confidentiality of personal information of the participants must be maintained. Thorough preparations were made for data collection tools and methods, and individuals involved in sample collection were trained to ensure the accuracy of the research results.

RESULTS AND DISCUSSION

Stress Levels among Nursing Students

A study involving 94 nursing students indicated that: The stress rate among nursing students is 38.3%, equivalent to 36 students. Within this group, students exhibiting stress symptoms number 58, equivalent to 61.7%, mild stress is seen in 33 students, accounting for 35.1%, and severe stress requiring examination and treatment is found in 3 students, corresponding to 3.2%.

Table 1: Stress rates of nursing students (n=94)

Level	Frequency (n)	Percentage (%)
Normal (no stress)	58	61.7
Has stress	36	38.3
Stress grouping		
Mild stress	33	35.1
Severe stress	3	3.2

The average stress score is relatively high at 21.2 ± 4.4, suggesting a risk of transitioning from normal to mild pathological stress. A significant proportion of students, 61.7%, experience low stress (≤23 points). However, the study also notes that a considerable percentage of students exhibit mild pathological stress levels (24-29 points) at 35.1%, and notably, 3 students experience severe pathological stress requiring examination and treatment (>30 points) which accounts for 3.2%.

Table 2: Stress scores and classification of stress groups (n=94)

Feature	Frequency (n)	Percentage (%)	Feature description	Value
Stress grouping			**Stress score**	
Normal (≤23 points)	58	61.7	Mean ± SD	21.2 ± 4.4
Mild pathological stress (24-29 points)	33	35.1	Median	22
Severe pathological stress needing examination and treatment (≥ 30 points)	3	3.2	Min - Max	7 - 31

A survey of 94 final-year nursing students at Tra Vinh University using the PSS-10 scale revealed an average perceived stress score of 21.2. Our results align with other studies, such as the study of nursing students at Dong Nai Medical College in 2013 by Nguyen Thi Dung, which showed a stress score of 20.8 (Nguyen TD, 2013), and the study by Ly Van Xuan and Le Thi Chau An on first-year medical students, which found a stress score of 20.7 (Ly VX & Le TCA, 2009). However, these figures are lower than the study at Hong Bang International University in 2021, which reported a stress score of 27.95 for fourth-year nursing students (Doan VDK, 2021), and the study by Doan Vuong Diem Khanh in 2016 on community health students, which found a stress score of 27.45 (Doan VDK, 2016). The differences might be due to the fact that the 2021 study at Hong Bang International University surveyed 48 final-year nursing students, most of whom were stressed, while our study surveyed 94 students and found a lower incidence of stress. Additionally, differences in educational programs, training objectives of each institution, and the timing of the study during the Covid-19 pandemic, which led to hardships such as online learning and limited interaction with faculty, might explain the discrepancy in stress levels between our study and others.

Stress levels were classified into three categories: 61.7% of students showed no signs of stress,

35.1% exhibited mild stress signs, and 3.2% experienced severe stress. These results are similar to those of Pham Ke Thuan and colleagues' 2020 study on 443 nursing and pharmacy students at Sai Gon Polytechnic College, where 37.9% experienced mild stress (Pham KT, 2020). However, compared to other studies, such as the 2013 survey at Dong Nai Medical College on 425 nursing students, which found 21.2% mild stress and 1.6% severe stress (Nguyen, 2013), and the study at Hanoi Medical University on 254 nursing students with a stress rate of 13.4% (Nguyen, 2022), and Nguyen Minh Thanh and colleagues' 2020 study at Hue University with a stress rate of 16.2% (Nguyen MT, 2020), our results show a higher stress rate. Conversely, our findings are lower than those of Nguyen Bich Ngoc and colleagues' 2020 study (Nguyen BN & Nguyen VT, 2020), which surveyed 300 nursing students at Hai Phong College and found a stress rate of 47.3%, and Phung Nhu Hanh and colleagues' 2018 study at Tien Giang Medical College, which found a stress rate of 47.6% (Phung NH., 2018). The variation in stress rates may be due to different training programs and objectives of the institutions surveyed. Additionally, the timing of our data collection, coinciding with students' clinical placements, could explain the higher stress rates found in our study compared to others.

Our study's stress rates were also higher compared to other health science fields such as pharmacy (Nguyen, 2016), community health (Doan VDK, 2016), and midwifery (Le, 2017), which reported stress rates of 16.4%, 24.9%, and 19.76%, respectively. However, compared to medicine (Tran, 2020), dentistry (Nguyen, 2018), and medical pharmacy (Pham, 2019), which reported stress rates of 78.2%, 66.84%, and 38.5%, respectively, our study found lower stress levels. This discrepancy can likely be attributed to differences in the specific nature of the study programs, training goals, and the timing and locations of the studies.

Factors Related to Stress among Nursing Students

The relationship between stress and demographic characteristics (age, gender, living arrangements, family economics) among nursing students in this study showed that male and female students had stress rates of 43.8% and 36.6%, respectively, with no statistically significant difference (p>0.05). The stress rate for students under 23 years old was 36.6% compared to 50.0% for those aged 23 and over, but this difference was not statistically significant (p>0.05). The majority of students were from the Kinh ethnic group, experiencing a stress rate of 37.5%, while the rates for other ethnicities were 40.9%; again, the differences were not statistically significant (p>0.05). The stress rates for students living in dormitories or rented housing was 31.1% compared to 51.5% for those living in their own homes, but this difference was not statistically significant (p>0.05). Economic status showed that students who were financially well-off or adequate had a stress rate of 38.8%, while those from average economic backgrounds had a stress rate of 33.3%, with no statistically significant economic effect (p>0.05). Students with good to excellent academic grades had a stress rate of 38.4%, versus 37.5% for those with average grades, but this difference was also not statistically significant (p>0.05).

Table 3: Relationship between stress and demographic characteristics (n=94)

Characteristic	Stress		OR CI 95%	p
	Yes n (%)	No n (%)		
Gender				
Male	7 (43.8%)	9 (56.2%)	1	0,62
Female	29 (36.6%)	49 (63.4%)	0.76 (0.26-2.26)	
Age Group				
<23	30 (36.6%)	52 (63.4%)	1	0,37
≥23	6 (50%)	6 (50%)	1.73 (0.51-5.86)	
Ethnicity				
The Kinh	27 (37.5%)	45 (62.5%)	1	0,77
Other	9 (40.9%)	13 (59.1%)	1.15 (0.43-3.05)	
Current living arrangement				
Dormitory, Rented housing	19 (31.1%)	42 (68.9%)	1	0,053
Own home	17 (51.5%)	16 (48.5%)	2.34 (0.98-5.61)	
Economic status				
Well-off, Adequate	35 (38.5%)	56 (61.5%)	1	0,85
Poor	1 (33.3%)	2 (66.7%)	0.8 (0.07-9.15)	
Academic performance previous term				
Good - Excellent	33 (38.4%)	53 (61.1%)	1	0,96
Average	3 (37.5%)	5 (62.5%)	0.96 (0.21-4.30)	

In this study, we found no significant correlation between stress and factors such as gender, age, academic performance, ethnicity, current living situation, and family circumstances (p > 0.05).

Regarding current living arrangements, 59.6% of students live in rented housing, which is 1.5 times higher than those living in their own homes or dormitories. This distribution shows that students living in their own homes (51.5%) have a stress rate 2.34 times higher than those in rented housing or dormitories (31.1%), but this difference was not statistically significant ($p > 0.05$). Our findings are consistent with those of Doan Vuong Diem Khanh in 2016 (Doan VDK, 2016), which showed stress rates of 41% for students living in their own homes and 34.2% for those in dormitories or rented housing, and with the study by Pham Ke Thuan and colleagues in 2020 (Pham KT, 2020), where the stress rate was 27.6% for students in dormitories or rented housing, higher than the 12.8% for students living with their families. However, there was no significant correlation found between stress and current living arrangements of the students ($p > 0.05$).

Regarding gender, male nursing students (43.8%) have a higher stress rate than female nursing students (36.6%), similar to findings from the 2020 study of nursing and pharmacy students at Sai Gon Polytechnic College (Pham KT, 2020). However, these results are lower than a survey of 345 first-year medical students at Hanoi Medical University (Nguyen, 2020), where the stress rates were 54.4% for males and 45.6% for females. The difference is due to our study focusing on nursing students, whereas the Hanoi Medical University study surveyed first-year medical students. The different academic specialties, research subjects, and training programs contribute to the variations in outcomes. Compared to the 2013 study by Nguyen Thi Dung (Nguyen TD, 2013), which surveyed 425 nursing students at Dong Nai Medical College, showing female stress rates at 23.7% higher than males at 16.0%, our findings differ. This is due to our study involving 94 university nursing students in 2023 versus a study of 425 college nursing students in 2013, leading to differences over nearly a decade. Moreover, the current environment shows that men and women are increasingly equal in academic and social relations, facing similar pressures, thus showing no significant difference in stress rates between genders (Pham KT, 2020).

In academic performance, students with good to excellent grades have a stress rate of 38.4%, higher than those with average grades at 37.5%. These results are lower than those from the 2020 study by Pham Ke Thuan (Pham KT, 2020), which surveyed 443 nursing and pharmacy students at Sai Gon Polytechnic College and found that 74.1% of students with good to excellent grades and 35.1% of students with average grades experienced stress. This difference can be attributed to the different study populations between university and college nursing and pharmacy students, as university programs demand broader knowledge beyond the major, while colleges focus more on the specialty, resulting in lower rates of good and excellent grades in our study. Additionally, differences in curriculum and study duration contribute to varying outcomes among studies. Regarding family economics, students from families that are financially stable or well-off have a higher stress rate (38.5%) compared to those from poorer economic conditions (33.3%). This finding aligns with the 2013 study of nursing students at Dong Nai Medical College (Nguyen, 2013) and the 2014-2015 study by Doan Vuong Diem Khanh and colleagues at Hue University of Medicine and Pharmacy (Doan VDK, 2014-2015). In these studies, stress was not found to be significantly related to family economic conditions.

CONCLUSION

To conclude, this study on stress among final-year nursing students at Tra Vinh University reveals that a significant portion of students experience stress, with specific links found between stress and religious affiliation. Factors such as gender, age, ethnicity, and living conditions did not significantly correlate with stress levels, suggesting that stress may be influenced by a mix of various internal and external pressures. These findings highlight the importance of implementing structured support systems within educational settings to help mitigate stress and improve student well-being and performance. Further research is needed to better understand the causes of stress variations across different student groups to tailor effective stress reduction strategies.

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