# Burnout and resilience among health science students: Concepts and their relationship

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## ABSTRACT

**Background:** Students in health-related fields often face with numerous factors can contribute to increased susceptibility to academic burnout and pressure during their studies.

**Objectives:** This study was conducted with the aim of investigating the level of burnout and resilience among health science students, as well as evaluating the relationship between students' resilience and their levels of academic burnout.

**Methods:** A cross-sectional study implemented on 319 students at a central university of Vietnam. The questionnaire included three sections: general characteristics, the Brief Resilience Scale and the Maslach Burnout Inventory-Student Survey. Descriptive statistics were used to describe the characteristics of the study subjects. Pearson product-moment correlation coefficient test was used to examine the relationship between students' resilience and academic burnout.

**Results:** The study found that 8.8% of students experienced academic burnout. The mean resilience score of students was $18.13 \pm 2.59$ out of a total of 27 points. There was a negative and moderate relationship between academic burnout with resilience among health science students ($r$=-0.318, P<0.001).

**Conclusion:** Schools and lecturers need to have strategies to train these soft skills to help students increase their resilience. In addition, some intervention studies aimed at helping students achieve coping skills and the ability to regulate emotions adaptively, increasing their resilience and reducing burnout can also be carried out in the future.

**Keywords:** Academic burnout, Health science students, Resilience

# 1. Introduction

Academic burnout is a common phenomenon characterized by excessive pressure experienced by individuals while completing academic tasks, such as projects, assignments, examinations, or pressures stemming from the learning environment [1]. Students in health-related fields often face a demanding learning environment, requiring in-depth specialized knowledge and skills, coupled with the pressures of examinations and the responsibility for patient care and well-being. These factors can contribute to increased susceptibility to academic burnout and pressure during their studies [2, 3]. A systematic review and meta-analysis revealed that the prevalence of burnout among health science students was 37.23% [4]. Another study conducted on 181 health science students in Iran reported that 74.6% experienced levels of burnout [5]. Burnout can lead to adverse effects on students' overall mental health, including depression, sleep disturbances, substance abuse, and even an elevated risk of suicide [6, 7].

Resilience training is increasingly recognized as a way to lessen stress and enhance well-being, particularly to prevent burnout [8, 9]. Resilience is often defined as the ability to adapt and transform challenges into opportunities, learn from difficult situations, or effectively respond to and cope with adversity, subsequently recovering and thriving [10]. Numerous studies have indicated that resilience is regarded as a protective factor that can help minimize the risk of academic burnout. Health science students with strong resilience often demonstrate a greater capacity to cope effectively with stress and difficulties, while maintaining motivation and enthusiasm in their studies [11-13].

In Vietnam, during our review process, it was found that research on this topic is still limited. Therefore, this study was conducted to examine the levels of burnout and resilience among health science students, as well as to evaluate the relationship between students' resilience and academic burnout.

# 2. Methods

## 2.1 Study Area

The study was carried out from August 2023 to August 2024 at Da Nang University of Medical Technology and Pharmacy, with 7 educational programs, including: Nursing (General, Dental, Anaesthesia, Obstetric Nursing), Doctor of Medicine, Pharmacy, Medical Laboratory, Rehabilitation

Technology, Medical Imaging Technology and Public Health.

## 2.2 Study Design

This was a cross-sectional study.

## 2.3 Sample Size and Sampling

For this study, the required sample size was determined using G*Power version 3.1.9.4. (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany; http://www.gpower.hhu.de/). For the correlation test, a two-sided analysis was applied with an effect size of 0.2 (which corresponds to a small effect size based on Cohen's (1988) guidelines and based on previous study [12]), an α error probability of 0.05, and a power of 0.95.

Given these parameters, the software indicated that at least 319 participants were required.

Participants consisted of full-time students enrolled at Da Nang University of Medical Technology and Pharmacy during the 2023-2024 academic year who were available at the time of the study. A proportional stratified random sampling technique was used to select individuals from all classes representing 7 educational majors. After determining the required number of participants for each class, the final selection was made at random (Figure 1). Students who were absent during the research period were excluded from the study.



Figure 1: Sampling procedure

## 2.4 Data Collection

This study collected data through a questionnaire comprising three distinct sections. The first one was about the general characteristics of research subjects including age, gender, year of study, major, current place of residence, health perception, participation in extracurricular activities, part-time work outside of school, and family economic status.

The Brief Resilience Scale (BRS) was employed to evaluate how persistently and dynamically individuals respond to stressors, their capacity to manage challenges despite hardships, and the speed with which they recover from adverse personal experiences. Originally developed by Smith and colleagues (2008), the scale comprises six items [14]. Respondents indicate their level of agreement on a 5-point Likert scale ranging from (1) strongly disagree to (5) strongly agree, with items 2, 4, and 6 scored in reverse before summing to obtain a total score. A higher total score reflects greater resilience. The scale has been translated into Vietnamese and was validated in a sample of Vietnamese adolescents, yielding a reliability coefficient of 0.752. The Kaiser-Meyer-Olkin test was conducted to assess the structural validity (KMO = 0.736; P < 0.001)

[15]. In this study, the Cronbach's alpha was 0.808.

The Maslach Burnout Inventory-Student Survey (MBI-SS) was utilized to assess academic burnout among students. Developed by Schaufeli and colleagues (2002), the instrument comprises 15 items grouped into three subscales: emotional exhaustion (items 1, 4, 7, 10, and 13), cynicism toward academic work (items 2, 5, 11, and 14), and academic efficacy (items 3, 6, 8, 9, 12, and 15). Responses are recorded on a 7-point Likert scale ranging from 0 (never) to 6 (always). Because the academic efficacy items are positively phrased, they are reverse-scored before the total burnout score is calculated, higher scores indicate a greater degree of burnout [16]. To classify the level of burnout, students are grouped based on the following criteria: a low burnout level is defined as having emotional exhaustion scores below 10, cynicism scores under 2, and academic efficacy scores above 27; a moderate level corresponds to emotional exhaustion scores between 10 and 14, cynicism scores between 2 and 6, and efficacy scores between 23 and 27; and a high level is characterized by emotional exhaustion scores over 14, cynicism scores above 6, and efficacy scores below 23.

Burnout is determined by the combination of high emotional exhaustion, high cynicism, and low academic efficacy [17, 18]. The Cronbach's alpha values for each subscale ranged from 0.67 to 0.82 [15]. The scale was translated into Vietnamese and validated with a sample of health science students, yielding a reliability coefficient of 0.744.

## 2.5 Data Analysis

Statistical analyses were performed using SPSS version 20.00, with a significance level set at 0.05. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the characteristics of the participants. Pearson product-moment correlation coefficient test was used to examine the relationship between students' resilience and academic burnout after verifying the assumptions.

## 3. Results

Participants ranged in age from 19 to 25 years, with a mean age of $20.86 \pm 1.49$. Most were female (68.7%) and 71.2% resided in rented accommodation. Their average academic score was $2.88 \pm 0.34$, and 83.7% indicated that their family's economic condition was at an average standard of living (Table 1).

Table 1: Characteristics of health science students (n=319)

| Characteristics | Number (n) | Percentage (%) |
|---|---|---|
| **Age** (Mean ± SD) | 20.86 ± 1.49 | |
| **Gender** | | |
| Male | 100 | 31.30 |
| Female | 219 | 68.70 |
| **Residence** | | |
| Home | 71 | 22.30 |
| Rented room | 227 | 71.20 |
| Dormitory | 19 | 6.00 |
| Others | 2 | 0.60 |
| **GPA** (Mean ± SD) | 2.88 ± 0.34 | |
| **Family economic status** | | |
| Poor, near-poor | 25 | 7.80 |
| An average standard of living | 267 | 83.70 |
| Upper average standard of living | 27 | 8.50 |

**Academic burnout among health science students**

Figure 2 illustrated both the prevalence of academic burnout among participants and the classification of the MBI-SS subscale scores.

The findings revealed that 8.8% (95% CI: 5.6-12.2) of students experienced academic burnout. Among the 319 students surveyed, 137 (42.9%; 95% CI: 37.6-48.6) reported high emotional exhaustion, 218 (68.3%; 95%

CI: 26.3-37.0) exhibited high levels of cynicism toward learning, and only 57 (17.9%; 95% CI: 13.8-21.9) had low levels of reduced efficacy.
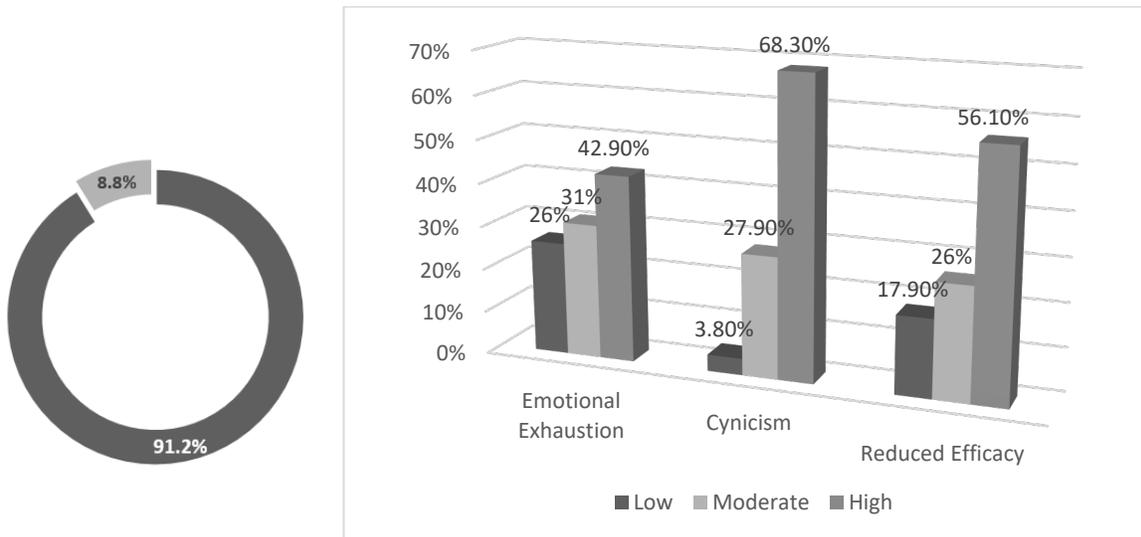


Figure 2:    Academic burnout among health science students

## Resilience among health science students

Although respondents demonstrated a moderate level of resilience, the moderate agreement with negative resilience statements indicated that some individuals may find it challenging to cope with setbacks and stress (Table 2).

Table 2: Resilience among health science students (n=319)

| No. | Items | Mean | SD | Rank |
|---|---|---|---|---|
| 1 | I tend to bounce back quickly after hard times | 3.43 | 0.87 | 1-5 |
| 2 | I have a hard time making it through stressful events | 3.36 | 0.81 | 1-5 |
| 3 | It does not take me long to recover from a stressful event | 3.36 | 0.85 | 1-5 |
| 4 | It is hard for me to snap back when something bad happens. | 3.10 | 0.92 | 1-5 |
| 5 | I usually come through difficult times with little trouble | 2.90 | 0.84 | 1-5 |
| 6 | I tend to take a long time to get over set-backs in my life | 3.09 | 0.85 | 1-5 |

## Association between academic burnout and resilience

There was a negative and moderate relationship between academic burnout with resilience among health science students ($r$=-0.318, $P<0.001$) (Table 3).

Table 3: Association between academic burnout and resilience (n=319)

| Variable | Academic burnout | |
|---|---|---|
| | $r$ | $P$ |
| **Resilience** | -0.318 | 0.000 |

## 4. Discussion

Health science students often face higher levels of stress compared to their peers in other disciplines due to the dual demands of academic coursework and clinical responsibilities [19]. In response to stressful situations, students may adopt various coping mechanisms. Avoidant coping strategies involve changing one's behaviour to evade challenging tasks or directing attention away from the troubling event or situation [20]. This raises the question: does such avoidance negatively affect students' experiences of academic burnout? This study investigated the relationship between resilience and academic burnout among students in health professions.

Our study also found that the rate of academic burnout among health major students was 8.8%, of which 42.9% had a high level of emotional exhaustion, 68.0% had a high level of scepticism towards learning, and only 17.9% had a low level of learning effectiveness. This result is similar to the study of *Tavares et al. (2020)* in Brazil [21], the study of *Altannir (2019)* in Saudi Arabia [22], and the study of *Barbosa (2018)* [23]. On the contrary, the results of our study also showed a lower rate than some other studies [5, 17, 18, 24, 25]. This may be explained by

the differences in social and cultural contexts as well as curriculum between medical schools that contributed to the variability in the study results [26]. In our study, students frequently received financial support and morale encouragement from their families during studies. Additionally, while participating in clinical activities at the hospital, they also received assistance from patients' families. As a result, their level of burnout was lower compared to some studies conducted in Western countries, where caregiving responsibilities rely solely on medical staff. Based on the results from the three subscales in this study, the proportion of students with high and moderate levels of emotional exhaustion was high (73.9%) as well as the proportion of students with high and moderate levels of academic scepticism was very high (96.2%), while the number of students who reported low academic performance was only 17.9%. This result was quite similar to previous studies [17, 18], which showed a high proportion of students with emotional exhaustion and cynicism, but a lower proportion of students with low academic efficacy and a lower overall burnout rate. This suggests that students with high academic performance can compensate for stress and reduce academic burnout. Students with high levels of emotional

exhaustion and academic cynicism tend to have lower academic efficacy [17, 18]. Additionally, our study found that psychological support programs and stress-relief initiatives for students were limited, a finding consistent with other studies [17, 18]. Therefore, improving learning efficiency (through study skills, time management, and psychological support) can help health science students maintain a positive psychological state and learn better.

Resilience is the ability to cope mentally or emotionally with a crisis or quickly return to a pre-crisis state [20], it is a continuous, lifelong process that can lead to more effective coping with stressors and more adaptive responses. The mean resilience score of the research subjects in our study was 18.13 ± 2.59 out of a total of 27 points. This result is higher than the result of *Haider. (2022)* with a mean score of 9.3 ± 3.4 [19] and of *Minh Nguyen et al. (2023)* with a mean score of 3.03 ± 0.62 on a 5-point scale [27]. This difference can be explained by the fact that the studies were conducted during the COVID-19 pandemic when students were isolated and faced more difficulties than when we conducted the study. Additionally, for negative resilience statements, some individuals may find it challenging to cope

with setbacks (3.43 ± 0.87) and stress (3.36 ± 0.81), respectively. This result was similar to the study of *Yu et al*. [28]. Accordingly, medical students face many pressures in their studies, especially the stressful clinical internship process, there are individuals who seem to "recover" quite effectively after negative events, while others are stuck, seemingly unable to escape their negative days. Therefore, health training universities should collaborate with the youth union to organize extracurricular activities and clubs that offer stress-relief strategies. Additionally, they should consider incorporating psychology courses into the curriculum to equip students with effective problem-solving skills for academic and clinical challenges. This approach would help students better manage stress and overcome difficulties. Our study found an inverse relationship between academic burnout and stress resilience (r=-0.318, P<0.001), meaning that students with higher levels of stress resilience were less likely to experience academic burnout. Our results were consistent with previous studies [11, 12, 29, 30]. This finding contributes to the current literature on the role of stress resilience in health science students. This is one of the important skills that help students limit the impact of burnout. This skill can be

practiced and developed over time. Building these skills and attitudes will help students not only overcome current challenges but also be ready to face future difficulties [31].

For the subscales of academic burnout, the study also found that students with lower levels of emotional exhaustion (r=-0.258; P<0.001), lower levels of cynicism toward learning (r=-0.221; P<0.001), and higher levels of academic efficacy (r=0.153; P=0.006) had better resilience to stress. This result is similar to the study of *Al-Awad (2024),* and the study of *Yu et al. (2020)* [28, 32]. The studies demonstrated that overcoming adversity is an important part of the process of developing resilience, and resilience plays a positive role in the mental health of health science students [28, 32, 33]. Therefore, for medical and pharmaceutical students who often face high stress, schools and lecturers need to have strategies to train these soft skills to help students increase their resilience. In addition, some intervention studies aimed at helping students achieve coping skills and the ability to regulate emotions adaptively, increasing their resilience can also be carried out in the future.

This study has some limitations. Firstly, as a cross-sectional study, it cannot establish causal relationships between the variables. Secondly, potential biases, such as self-report bias where students may choose responses based on social expectations could impact the accuracy of the findings. Additionally, the MBI-SS scale offers various methods for assessing results, which complicates our ability to find similar studies for comparison and discussion.

## 5. Conclusion

This study conducted with 319 students from health sciences disciplines indicated that the rate of academic burnout among students was relatively low compared to previous research findings. Additionally, the mean score of resilience was moderate. The results revealed a significant relationship between stress recovery ability and the level of academic burnout. These recovery skills can be trained and developed. Therefore, both students and educational institutions should implement strategies to cultivate these soft skills, enhancing students' recovery abilities, which in turn can reduce the incidence of academic burnout.

## Author contributions

TTHO: Conceptualization, data curation, formal analysis, methodology, writing original draft, writing review and editing. NTYH: Conceptualization, methodology, supervision, writing original draft, writing review and editing. LTT: Conceptualization, methodology, writing original draft, writing review and editing. TTTH: Conceptualization, methodology, writing original draft, writing review and editing. PTT: Conceptualization, methodology, writing original draft, writing review and editing.

## Declaration

### Ethics approval and consent to participate

The study was conducted after it was approved by the Medical Ethics Committee of Da Nang University of Medical Technology and Pharmacy and received approval to allow access to students (approval No. DUMTP-2023-143). The purpose and significance of the study were thoroughly explained to all participants. Those students who consented to take part in the study voluntarily signed the consent form. Furthermore, participants were informed that they had the right to decline or withdraw from the study at any point without any consequences.

### Competing interests

We declared that we have no competing interests

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