

Original Research

Determinants of Stress Among Health Students: Academic Pressure, Internal Conditions, and Learning Support

Amalia Salma Anindya^{1*}, Faqih Jibrán Syah Falaifi¹, Titi Nur Hasanah¹, Ririn Cahya Dewanti¹, Salsabila Khoirun Nisa¹, Aan Sofyan¹

¹ Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, Indonesia

ABSTRACT

Background: Health students tend to have a higher prevalence of stress compared to those in other study programs, which may negatively affect academic achievement and potentially lead to burnout. Stress is one of the most common psychological problems among health students, primarily triggered by academic demands and limited learning support. This study aimed to determine stress levels and analyze their association with academic pressure, negative internal conditions, and learning support.

Methods: A descriptive-analytic cross-sectional study was conducted among 367 health science students at one university in Surakarta, Indonesia, selected using accidental sampling. Stress levels were measured using the Depression Anxiety Stress Scale (DASS-21) along with a questionnaire assessing stress-related determinants. Data were analyzed using cross-tabulation and chi-square tests to examine the association between determinant factors and students' stress levels.

Results: Data analysis showed that 51.0% of students experienced mild stress, 43.9% had normal stress levels, and 5.2% experienced severe stress. Academic pressure, negative internal conditions, and limited learning support were significantly associated with stress levels ($p < 0.001$). Students with high academic pressure and limited learning support were more likely to experience mild to severe stress.

Conclusion: Student stress levels are significantly influenced by academic demands, internal psychological factors, and learning support availability. Strengthening academic assistance, psychological support, and learning resources is essential to reduce student stress and improve well-being.

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CONTACT

Amalia Salma Anindya



amaliasalmaanindya@gmail.com

Faculty of Health Sciences,
Universitas Muhammadiyah
Surakarta, Indonesia

Jl. Ahmad Yani, Pabelan, Kartasura,
Sukoharjo, Jawa Tengah 57169,
Indonesia

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INTRODUCTION

A condition of mental, physical, emotional, and psychological tension that results in an inappropriate, excessive, and harmful bodily response is known as stress (Ovsiannikova et al., 2024). Individuals exposed to the same stress may respond differently depending on their ability to cope and their perception of the stressors. The

process of an individual's life journey is often full of challenges which, if overcome, will form eustress (beneficial stress). However, prolonged, continuous, and severe stress can lead to psychosomatic disorders and anxiety, which is referred to as distress (harmful stress) (Gong & Geertshuis, 2023). In the academic context, university students are considered a high-risk group for experiencing stress, particularly academic stress. In Indonesia, the prevalence of academic stress among students ranges from 36.7% to 89.6%, which is largely influenced by excessive academic workload, pressure to achieve high grades, poor time management, and financial problems (Putri et al., 2024).

Misra and Castillo (in Hernández-Torrano & Ibrayeva, 2025) say that the new educational and social environment faced by students can cause stress. Students are required to deal with assignment demands, major choices, attending classes, and adjusting to a new social environment. Many students also have to work while studying or live away from home for the first time. When students experience stress and these conditions are not handled properly, the stress can lead to risky behavior and depression.

Previous studies have shown mixed findings regarding factors influencing student stress. For instance, a study among medical students at Universitas Malahayati reported that the learning environment did not have a statistically significant effect on student stress levels (Aulia et al., 2023). However, other studies consistently indicate that students in health-related programs, such as medicine and nursing, experience higher levels of academic stress compared to other fields. This is largely due to heavy academic workloads, clinical practice demands, and intense competition, which increase the risk of moderate to severe stress (Nappoe & Triwahyuni, 2025).

For health students, academic grades are very important as a benchmark and to produce professional health workers who meet the needs of public health services. Therefore, students have anxiety related to achieving academic grades and the time it takes to complete their studies (Malau, 2020). One common source of stress is examinations, which are used to assess students' knowledge and competencies. Exam anxiety can also be referred to as anticipatory anxiety, which is anxiety that occurs in situations such as facing exams. Exams are estimated to be a high-stress trigger for 63.1% of all students in a study conducted at a medical school in Serbia. At the same time, normal anxiety is very helpful in preparing students for exams (Al-Shahrani et al., 2023).

Academic stress can be defined as the mental and physical response of the body when academic demands exceed students' adaptive abilities, especially in the absence of social support (Al-Shahrani et al., 2023). Students consider their time at university to be a very stressful period. A study involving 2,456 students with an average age of 22.5 years reported that academic stress harms critical thinking and academic performance (Trigueros et al., 2020). Stress can also extend into post-graduation and practical life. Appropriate interventions can help health students cope with stress and improve their personal and professional lives (Al-Shahrani et al., 2023)

In line with this, a private Muslim university in Central Java, as a health education institution, has attempted to address student stress through counseling services, academic guidance, and various student activities that support mental health. However, these efforts are still general in nature, and there has not been much research specifically mapping the prevalence of stress among health students and identifying the most dominant contributing factors. Therefore, this study offers novelty by specifically focusing on health students within a private Muslim university in Central Java, a population that has not been widely explored in previous research, particularly in terms of identifying the most dominant factors contributing to stress in a comprehensive manner. Unlike prior

studies that tend to examine student stress in general or across broader populations, this research emphasizes a more specific academic and cultural context.

MATERIALS AND METHOD

This study used a cross-sectional approach with a descriptive analytical research design. This design was chosen because it allows the researcher to measure the prevalence of stress and examine the relationship between variables at a single point in time in an efficient manner. This design is also suitable for describing the respondents' actual circumstances without intervening in the research variables.

The population in this study consisted of students from the Faculty of Health Sciences (Nursing, Nutrition, Public Health, and Physiotherapy Study Programs), the Faculty of Pharmacy, the Faculty of Dentistry, and the Faculty of Medicine at a private Muslim university in Central Java from the 2020 to 2023 cohorts. Based on data from the student monitoring system, the total population was 4,696 students. The sampling technique used was accidental sampling with a 5% margin of error and a 95% confidence level. The sample size was determined using the Yamane formula (Sugiyono, 2019). Thus, the minimum required sample size was 367 respondents and was rounded to 368 students.

$$n = N / (1 + N(e)^2)$$
$$n = 4696 / (1 + 4696 (0.05)^2)$$
$$n = 367$$

Explanation:

n : Number of samples

N : Number of respondents data

x : Independent variable

y : Dependent variable

The data collection method used in this study was a survey. The instruments consisted of: (1) the Depression Anxiety Stress Scale (DASS), specifically the stress subscale, which measures the level of stress experienced by respondents (Sarfika et al., 2024); and (2) an 18-item questionnaire on factors causing stress, adapted and modified from the Patient Health Questionnaire-9 (PHQ-9) (National HIV Curriculum, 2025). The DASS instrument assesses the severity of stress symptoms, while the modified questionnaire explores possible contributing factors to stress.

The dependent variable in this study was the stress level among health students. The independent variables included factors that may contribute to stress, such as academic pressure, lifestyle, and other related conditions measured through the stress-causing factors questionnaire. Data were collected directly by the researcher with the assistance of enumerators. Respondents completed the questionnaires independently (self-administered) to ensure privacy and reduce response bias. The questionnaires were distributed either in printed form or via an online platform, depending on accessibility.

The data were analysed using univariate and bivariate analyses. Univariate analysis was conducted to describe the characteristics of the respondents and the distribution of the research variables, including the stress levels of health science students. Meanwhile, bivariate analysis was carried out using cross-tabulation and the chi-square test to examine the relationship between the determining factors, namely academic pressure, internal conditions, and learning support—and the students' stress levels. The results of

the chi-square test were used to determine the presence or absence of a statistically significant relationship between variables at a significance level of $p < 0.05$.

Ethical principles were applied throughout the study. Prior to data collection, ethical clearance was obtained from an authorized ethics committee. The study adhered to principles of voluntary participation, informed consent, confidentiality, and anonymity of respondents. Participants were informed about the purpose of the study and their right to withdraw at any time without consequences. This study has received ethical approval from the Health Research Ethics Committee Faculty of medicine of Universitas Muhammadiyah Surakarta, with reference number 5337/B.2/KEPK-FKUMS/XI/2024, issued on 13 November 2024.

RESULTS

Table 1. Distribution of Respondents' Characteristics by Study Program and Academic Year (n = 367)

| Variable | Frequency (n) | Percentage (%) |
|-----------------------|---------------|----------------|
| Study Programs | | |
| Public Health | 168 | 45.8 |
| Nutrition Science | 41 | 11.2 |
| Physical Therapy | 39 | 10.6 |
| Nursing | 33 | 9.0 |
| Dentistry | 19 | 5.2 |
| Medicine | 38 | 10.4 |
| Pharmacy | 29 | 7.9 |
| Class Year | | |
| 2021 | 157 | 42.7 |
| 2022 | 160 | 43.6 |
| 2023 | 50 | 13.6 |

Based on Table 1, the distribution of respondents consisted of health students from Universitas Muhammadiyah Surakarta who were divided into seven study programs. Respondents who met the inclusion criteria were students enrolled in 2021, 2022, and 2023. The questionnaire distribution process was conducted using random sampling through online and offline media. A total of 367 students responded, with the majority coming from the Public Health study program (45.8%) and the 2022 cohort (43.6%), followed by the 2021 cohort (42.7%) and the 2023 cohort (13.6%).

Table 2. Frequency Distribution of Stress Levels Based on the the Depression Anxiety Stress Scale (DASS) 21 Method (n = 367)

| Stress Level | Depression | | Anxiety | | Stress | |
|--------------|------------|------|---------|------|--------|------|
| | n | % | n | % | n | % |
| Normal | 281 | 76.6 | 212 | 57.8 | 161 | 43.9 |
| Mild | 82 | 22.3 | 142 | 38.7 | 187 | 51.0 |
| Severe | 4 | 1.1 | 13 | 3.5 | 19 | 5.2 |

Note: n = number of observations; % = percentage

Based on Table 2, it is known that the majority of health students had normal levels of depression (76.6%) and anxiety (57.8%). Meanwhile, in the stress category, most students experienced mild stress levels (51.0%), followed by normal stress levels (43.9%) and severe stress levels (5.2%).

Table 3. Table 3. Frequency Distribution of Stress Determinant Factors Among Respondents (n = 367)

| Determinant or Stress | Normal | | Mild | | Severe | |
|------------------------------|--------|------|------|------|--------|-----|
| | n | % | n | % | n | % |
| Academic pressure | 189 | 51.5 | 154 | 42 | 24 | 6.5 |
| Negative Internal Conditions | 215 | 58.6 | 132 | 36 | 20 | 5.4 |
| Limited Learning Support | 145 | 39.5 | 197 | 53.7 | 25 | 6.8 |

Note: n = number of observations; % = percentage

Based on Table 3, stress factors are divided into three categories, namely academic pressure and limited learning support. The results show that limited learning support is the main factor causing stress among students, with 6.8% experiencing severe stress and 53.7% experiencing moderate stress. These figures are higher than those for other factors, which are predominantly in the mild category.

Table 4. Cross Tabulation Results Stress Levels and Academic Pressure (n = 367)

| Academic Pressure | Stress Levels | | | | | | <i>p-value</i> |
|-------------------|---------------|------|------|------|--------|-----|----------------|
| | Normal | | Mild | | Severe | | |
| | n | % | n | % | n | % | |
| Light | 118 | 32.1 | 71 | 19.3 | 0 | 0.0 | <0.001 |
| Moderate | 42 | 11.4 | 104 | 28.3 | 8 | 2.2 | |
| Heavy | 1 | 0.3 | 12 | 3.2 | 11 | 3.0 | |

Note: n = number of observations; % = percentage

The majority of respondents with low academic pressure were in the normal stress category (32.1%). However, the higher the academic pressure experienced by students, the more who experienced moderate to severe stress. In the group with moderate academic pressure, 32.8% of respondents experienced mild stress and 8.9% experienced severe stress. Meanwhile, in the group with heavy academic pressure, although the number of respondents was relatively small, the proportion of severe stress still increased to 3.0%. Statistical test results showed a $p\text{-value} < 0.001$, which means there is a significant relationship between academic pressure and stress levels. This indicates that the higher the academic pressure, the greater the likelihood of students experiencing moderate to severe stress.

Table 5. Cross Tabulation Results Stress Levels and Negative Internal Conditions (n = 367)

| Negative Internal Conditions | Stres Levels | | | | | | <i>p-value</i> |
|------------------------------|--------------|------|------|------|--------|-----|----------------|
| | Normal | | Mild | | Severe | | |
| | n | % | n | % | n | % | |
| Light | 124 | 33.7 | 91 | 24.7 | 0 | 0.0 | <0.001 |
| Moderate | 37 | 10.1 | 85 | 23.1 | 11 | 3.0 | |
| Heavy | 0 | 0.0 | 11 | 3.0 | 9 | 2.4 | |

Note: n = number of observations; % = percentage

Respondents with mild negative internal conditions were mostly in the normal stress category (33.7%). Meanwhile, respondents with moderate internal conditions were mostly in the mild stress category (23.1%), and those with severe negative internal conditions were predominantly in the mild stress category (3.0%). The statistical test results showed a $p\text{-value} < 0.001$, indicating a significant relationship between negative

internal conditions and stress levels. Thus, the more negative the internal conditions of students, the higher the level of stress experienced.

Table 6. Cross Tabulation Results Stress Levels and Limited Learning Support (n = 367)

| Limited Learning Support | Stres Levels | | | | | | <i>p-value</i> |
|--------------------------|--------------|------|------|------|--------|-----|----------------|
| | Normal | | Mild | | Severe | | |
| | n | % | n | % | n | % | |
| Light | 94 | 25.6 | 52 | 14.2 | 0 | 0.0 | <0.001 |
| Moderate | 67 | 18.2 | 122 | 33.2 | 8 | 2.2 | |
| Heavy | 0 | 0.0 | 14 | 3.8 | 11 | 3.0 | |

Note: n = number of observations; % = percentage

DISCUSSION

Stress Levels

Students' readiness to take exams is influenced by various psychological conditions and contributing factors. In this study, stress levels were measured using the DASS-21 method. Overall, the findings indicate that students tend to experience stress more prominently compared to depression or anxiety. This is in line with the theoretical framework of the DASS-21, in which stress is understood as an individual's initial response to external pressures, particularly those related to academic demands and psychological burdens. Stress, especially at a mild level, often appears as an early reaction before potentially developing into more severe conditions such as anxiety or depression if not managed properly.

The results of this study are in line with the study by Sari et al. (2025) which reported that the majority of students experienced mild to moderate stress, while depression and anxiety were relatively low. Similarly, research by Andini et al. (2023) found that stress was the most common psychological symptom that appeared before exams compared to the other two components in DASS-21. This supports the finding that stress is more easily experienced because of its adaptive nature to short-term academic pressure. In addition, Izza and Lailiyah (2024) also found a higher prevalence of depression among final-year students due to the burden of thesis writing and field practice, which differs from the results of this study, where depression was relatively low.

Thus, health students tend to be more prone to mild stress as an adaptive response to academic demands, but it does not always develop into anxiety or depression due to the presence of protective factors such as social support and effective coping strategies. The DASS-21 theory supports this view, in which stress is an initial stage that, if prolonged, can affect more serious emotional conditions. Therefore, the high prevalence of mild stress among students can be an early indicator (warning sign) that needs attention so that it does not develop into more severe psychological disorders.

Causes of Stress

Stress levels among health students are a complex phenomenon influenced by various factors, both internal and external. The Depression Anxiety Stress Scale (DASS-21) theory explains that stress arises as an individual's initial response to excessive external and internal pressures, characterized by difficulty relaxing, feelings of tension, irritability, and difficulty concentrating (Lovibond & Lovibond, 1995). In this study, three main factors were examined, including academic pressure, negative internal conditions,

and limited learning support. Cross-tabulation analysis shows that all three have a significant relationship with student stress levels. The following is a discussion of these factors:

Academic Pressure

Students' readiness to take exams is influenced by various psychological conditions and contributing factors. In this study, stress levels were measured using the DASS-21 method. Overall, the findings indicate that students tend to experience stress more prominently compared to depression or anxiety. These findings are in line with the research by Tuwanakotta and Kristinawati (2024) which reported that the transition of new students, busy class schedules, and academic achievement demands trigger an increase in stress.

Similarly, Khovi et al. (2025) found that academic burden—such as excessive assignments, tight deadlines, and high grading expectations—is a primary source of stress among students. Such pressures often lead to physical and mental fatigue, decreased academic performance, and may even contribute to anxiety disorders.) However, other studies suggest that, beyond stress, these factors can also trigger higher levels of anxiety. Romadon et al. (2025) highlighted that excessive academic pressure, cognitive distortions, traumatic experiences, lack of social support, and difficulties in adapting to the campus environment are key contributors to heightened anxiety among students.

Negative Internal Conditions

The analysis indicates that students with more negative internal conditions tend to experience higher levels of stress. This shows that internal factors, such as emotional instability, anxiety, and low self-confidence, play an important role in influencing students' stress levels. These results are consistent with the study by Mofatteh (2020), which reported that psychological barriers—such as low self-esteem, lack of confidence, and emotional anxiety—are internal factors that can exacerbate stress. Similarly, Lovela and Suryadi (2024) found that high self-confidence can reduce academic or work-related stress by minimizing fear of failure, while strong motivation enhances resilience and active engagement, ultimately lowering anxiety levels.

However, these findings differ from those reported by Yunarti et al. (2024) who found that external factors are more dominant than internal factors in triggering stress, particularly among final-year students. This discrepancy suggests that the influence of internal and external factors on stress may vary depending on individual characteristics and academic context. These differences may also be influenced by variations in the learning environment, academic workload and the social support received by students.

Limitations of Learning Support

The findings indicate that students with lower levels of learning support tend to have better stress conditions, while limited or insufficient learning support is associated with higher levels of stress. This suggests that the availability and quality of learning support play an important role in influencing students' stress levels. These findings are in line with the research by Ullah et al. (2023) which states that social support, both verbal and nonverbal, plays an important role in reducing academic stress.

Similarly, Konstantinidis (2024) emphasizes that limited facilities and learning resources can exacerbate students psychological stress. However, research by Andini et al. (2023) found that learning support only plays a moderate role, while academic pressure

is a more dominant factor. These differences in results may be influenced by variations in the availability of learning facilities at each university. Based on the results of the DASS-21 research and theory, it can be hypothesized that the higher the academic pressure experienced by students, the greater the likelihood of them experiencing moderate to severe stress (Konstantinidis, 2024).

In addition, negative internal conditions such as low self-esteem and difficulty managing emotions are closely related to increased stress, especially when not accompanied by adequate coping skills. On the other hand, limited learning support is also a significant external factor in triggering stress, as the absence of facilities and social support makes students more vulnerable to psychological disorders. Thus, these three factors are interrelated in shaping students' stress levels, and according to the DASS-21 framework, mild stress arising from academic pressure, negative internal conditions, or limited learning support can be an early warning sign that, if left unaddressed, has the potential to develop into anxiety or depression (Konstantinidis, 2024).

The implications of this study highlight the importance of developing more targeted intervention programs within educational institutions. Universities are expected to strengthen academic support systems, provide accessible counseling services, and implement programs that enhance students' coping skills and emotional regulation. These efforts can help prevent the escalation of stress into more severe mental health problems.

This study has several strengths. It focuses specifically on health students, a group with high academic demands, and examines multiple contributing factors simultaneously, providing a more comprehensive understanding of student stress. In addition, the use of a standardized instrument such as DASS-21 supports the reliability of the findings. However, this study also has limitations. The use of a cross-sectional design limits the ability to determine causal relationships between variables. In addition, the use of accidental sampling may reduce the generalizability of the results. Therefore, future research is recommended to use longitudinal designs and more representative sampling techniques, as well as to explore additional variables such as coping strategies, social environment, and institutional policies to gain a deeper understanding of student stress.

CONCLUSION

This study concludes that stress among health students is significantly influenced by academic pressure, negative internal conditions, and limited learning support. These factors are associated with increased levels of stress, ranging from mild to severe, and indicate that stress is the result of an interaction between internal and external determinants. Based on the DASS-21 framework, mild stress may serve as an early warning for the potential development of more severe psychological conditions such as anxiety or depression if not properly managed. Therefore, effective coping strategies, self-management, and adequate academic and social support are essential to help students adapt to academic demands and prevent worsening mental health outcomes.

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