

ORIGINAL ARTICLE**THE RELATIONSHIP BETWEEN ACADEMIC STRESS AND EYESTRAIN IN HIGH SCHOOL****Ni Putu Puspita Dewi***, Ni Kadek Muliawati, Putu Gede Subhaktiyasa*Bachelor of Nursing Study Program, STIKES Wira Medika Bali, Denpasar, Bali, Indonesia**Corresponding author: dewi21095@gmail.com**ARTICLE INFO***Article history:**Received: 20 January 2026**Revised: 5 February 2026**Accepted: 14 February 2026**Keywords:**Academic;**Eyestrain;**Student;**Stress.***ABSTRACT**

Background: Academic stress is a psychological problem that adolescents often experience and has the potential to cause physical disorders, including eyestrain, especially in digital device-based learning. **Objective:** This study aims to analyze the relationship between academic stress and eyestrain in adolescents at Public Senior High School Negeri 2 Sukawati. **Methods:** The research design is cross-sectional. The population amounted to 338 students. The sampling technique used proportionate stratified random sampling, and the sample consisted of 183 respondents among first- and second-grade students. Academic stress was measured using the Educational Stress Scale for Adolescents (ESSA) questionnaire, and eyestrain was measured by the Visual Fatigue Index (VFI) questionnaire. Data analysis used the Chi-Square test with a significance level of 0.05. **Results:** The dominant level of academic stress was the moderate category (66.1%), and most respondents experienced eyestrain (81.4%). Statistical tests showed a significant association between academic stress and eyestrain ($p = 0.002$). **Conclusion:** Academic stress increases the risk of eyestrain in adolescents. These findings emphasize the importance of efforts to manage academic stress and control the use of digital devices as part of adolescent health promotion in the school environment.

BACKGROUND

Adolescents are an age group that is prone to various health problems due to the increasingly complex psychological and academic development pressures (Suppiej et al., 2025). The development of an increasingly competitive education system and the use of digital technology in learning make adolescents face more complicated learning pressures (Sharma & Nigam, 2025). High learning demands, long learning durations, and constant use of digital devices can lead to a variety of health problems, including mental and physical disorders (Rimala et al., 2024). One of the physical complaints that adolescents often experience is eyestrain, characterized by tired, dry eyes, blurred vision, headaches, and problems with reading or staring at digital screens for too long (Kaur et al., 2022).

Globally, the prevalence of eyestrain in children and adolescents is quite high. According to systematic observation, the rate of eyestrain in children and adolescents ranges from 12.4% to 26.4% (Vilela et al., 2015). A study in Iran found that 49.4% of adolescents (12–18 years) experience eyestrain (Hashemi et al., 2017). Meanwhile, in Brazil, the incidence rate in school-age children is 24.7% (Vilela et al., 2015). Previous research in Indonesia reports that the prevalence of students' eyestrain is more than 70%, especially after the implementation of online learning (Syihabudin, 2023). This shows that eyestrain is a serious health problem for school-age adolescents.

Academic stress is a psychological condition that occurs when the demands of learning and academic tasks exceed a person's ability to adapt. This leads to negative emotional reactions, behavioral, and physical factors (Barseli et al., 2018). Previous research has shown that academic stress can lead to a variety of physical problems, such as sleep disturbances and general fatigue (Hakim et al., 2024). Academic stress and poor sleep quality in students were correlated (Ramadhani & Utami, 2024). Academic stress can affect students' degree of fatigue. Academic stress encourages overlong study, increasing eye workload, and exacerbating eyestrain. Although much research exists on academic stress, general fatigue, and sleep quality, research remains limited on the correlation between academic stress and adolescent eyestrain. Previous research has usually focused on learners and assessed nonspecific eye health due to academic stress.

OBJECTIVE

The purpose of this study was to find out the relationship between academic stress and eyestrain in high school adolescents.

METHOD

Design, Population and Sample

This research was conducted at Public Senior High School 2 Sukawati, Gianyar Regency, Bali, from August to September 2025. This study is a quantitative-based study with an analytical observational design using a cross-sectional approach to review the

relationship between academic stress and eyestrain in adolescents. This research has obtained ethical clearance from the Health Research Ethics Committee of STIKes Wira Medika Bali with ethics number 648/E1.STIKESWIK/EC/IX/2025, as well as research permission from the school. All respondents provided informed consent before participating, and the confidentiality of respondents' data was fully maintained in accordance with research ethics principles.

The population in this study includes all the first- and second-grade students (338 students). Sample determination was carried out using the proportionate stratified random sampling technique. Based on the sample calculation, 183 students who met the inclusion criteria were obtained, namely students in first and second grade who were willing to be respondents and did not have a history of severe visual impairment or previously known eye diseases.

Instrument and Data Analysis

Data collection is used with standardized questionnaires. Academic stress is measured using the Education Stress Scale for Adolescents (ESSA). ESSA was developed by Jiandong Sun, Michael Dunne, Xiang-Yu Hou, and Aiqiang Xu in 2011 (Sun et al., 2011). Data collection was conducted using a standard questionnaire. Adolescent Stress Scale dimensions include Pressure from Study, Workload, Worry about Grades, Self-Expectation, and Despondency. The Pressure from study dimension (items 1, 2, and 3) describes the pressure felt by students due to learning demands, parental expectations, and concerns about the future. The Workload dimension (item 7) shows students' perceptions of the number of exams or tests as a source of stress. The Worry about Grades dimension (items 8 and 9) reflects students' concerns about academic grades and their fear of disappointing their parents. Furthermore, the Self-Expectation dimension (items 12 and 14) describes pressure stemming from self-imposed standards and expectations, as well as dissatisfaction with academic achievement. Meanwhile, the Despondency dimension (item 15) reflects feelings of low self-confidence and a tendency toward negative feelings about academic achievement as an emotional impact of academic stress.

The eyestrain variable is measured by the Visual Fatigue Index (VFI), which is an index of visual fatigue that causes eye complaints such as eyestrain, blurred vision, dry eyes, and headaches caused by near-sighted activities. The Visual Fatigue Index (VFI) was developed by Hassan Rajabi-Vardanjani, Ehsanollah Habibi, Siyamak Pourabdian, Habibollah Dehghan, and Mohammad Reza Maracy in 2014 (Rajabi-var-danjani et al., 2014). Data analysis was carried out in stages, including univariate analysis to describe respondent characteristics and the distribution of research variables, and bivariate analysis to test the relationship between academic stress and eyestrain. The statistical test used was the Chi-Square test ($\alpha = 0.05$).

RESULTS

Table 1. Respondent Characteristics (n = 183)

Characteristics	Frequency (f)	Percentage (%)
Gender		
Male - Male	86	47,0%
Women	97	53,0%
Age		
15 Years	65	35,5%
16 Years	88	48,1%
17 Years	30	16,4%
Average Learning Time		
1 - 6 Hours	4	2,2%
7 - 10 Hours	154	84,2%
11 - 20 Hours	25	13,6%
Total	168	100%

Table 1 shows that the characteristics of the respondents were dominated by 16-year-olds (48.1%), the majority were women (47.0%), and the average study time was between 7 and 10 hours (84.2%).

Table 2. Results of Statistical Test on the Relationship between Academic Stress and Eyestrain (n = 183)

Academic Stress	Eyestrain						P-Value
	Experiencing Eyestrain		Not Experiencing Eyestrain		Total		
	F	%	F	%	F	%	
Lightweight	0	0,0	1	0,5	1	0,5	0.002
Medium	92	74,4	29	25,6	121	66,1	
Weight	57	93,4	4	6,6	61	33,4	
Total	149	81,4	34	18,6	183	100,0	

Table 2 shows that the majority of respondents were in moderate academic stress (66.1%). A total of 149 respondents (81.4%) experienced eyestrain. This shows that the higher the level of academic stress experienced, the greater the percentage of students who experience eyestrain. The chi-square test showed a p-value of 0.002. It means there is a correlation between academic stress and eyestrain in adolescence.

DISCUSSION

This study found that most respondents at Public Senior High School Negeri 2 Sukawati were categorized in the moderate stress stage. In line with previous research, students experience moderate-stage academic stress due to increased academic demands, which triggers study fatigue (Lolan et al., 2021). Another study confirms that experiencing academic stress can cause fatigue (Ramadhani & Utami, 2024). The level of stress they experience is in the medium category because students are still able to adapt well. Adolescents' academic stress can be distressing, then affecting various complaints such as physical and cognitive fatigue. Stress can show physical signs such as tiredness or headaches, psychological signs such as anxiety or feelings of sadness, and decreased learning outcomes (Lolan et al., 2021).

The results of this study showed that most of the respondents experienced eyestrain. Eyestrain is not only affected by digital devices but also by the learning load and the type of visual activity performed. When the pressure of study assignments increases, they will feel loss of energy, have difficulty concentrating, and feel tired (Ramadhani & Utami, 2024). Students will spend more time using digital devices in the current digital-based learning era, resulting in digital fatigue (Februati et al., 2024). This is shown by symptoms such as tired eyes, difficulty focusing, and decreased enthusiasm for learning. Academic stress not only influences psychological aspects but also impacts physical health, including eye health. Increasingly high stress levels can heighten physical fatigue, including fatigue caused by excessive academic workload (Lolan et al., 2021). Academic stress is a risk factor for fatigue, including eye strain resulting from continuous visual activity. Stress and mental fatigue can delay the physiological eye response (Pavel et al., 2023).

The researchers' assumptions regarding the relationship between academic stress and eyestrain in this study were influenced by the data collection conditions carried out during the daily repetition period, so that the learning load increased. Students usually study for 7 to 10 hours a day; such a long learning duration makes them use their eyes for longer to read and write. It also shows that their learning demands are very high. The heavier the academic pressure, such as exam preparation, the need to get good grades, and the amount of material that must be understood, the longer students will be involved in learning activities such as reading, writing, and doing assignments. Other factors that have not yet been measured, such as previous eye conditions, light quality, and eye rest habits, may also help to strengthen the link between academic stress and eyestrain in these schools.

CONCLUSION

According to the results of this research, most respondents were in moderate stress. Otherwise, most respondents experienced symptoms of eyestrain. This reflects that academic stress is a real condition experienced by students in the daily learning process and illustrates the difference in students' adaptability to academic demands. These findings suggest that continuous visual activity, especially the use of digital devices

for learning, contributes to the emergence of eyestrain complaints in adolescents. There is a correlation between academic stress experienced and eyestrain in adolescence.

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