Participatory Educational Research (PER)
Vol.13(1), pp. 176-190, January 2026
Available online at http://www.perjournal.com
ISSN: 2148-6123
http://dx.doi.org/10.17275/per.26.10.13.1

Prediction of Students' Growth Mindsets on Their Moods

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Article history
Received:
07.04.2025

Received in revised form:
10.09.2025

Accepted:
12.10.2025

Key words:
growth mindsets, mood, student, mindset, fixed mindsets, emotion, cognition

The aim of the study was to determine the predictive value of individuals' Growth Mindset on their emotional states. The study employed a correlational design within the scope of quantitative research. The independent variables of the study are the Theories of Mind of university students, while the dependent variable is the mood of individuals. The study group consists of university students, with 52.4% being women and 47.6% being men. The study group comprises 10.4% first-year students, 22.6% second-year students, 32.2% third-year students, and 34.8% fourth-year students. Three data collection tools were used within the scope of the research. These are the "Emotion Scale", the "Growth Mindset Scale", and the "Personal Information Form". The relationship between the independent variable and the dependent variable in the research was tested with the Pearson Product-Moment Correlation Coefficient. The predictive power of the independent variables on the dependent variable in the research was tested with multiple regression. The study results showed a positive significant relationship between the belief in improvement and the effort sub-dimension scores of individuals' fixed mindsets and the positive emotions sub-dimension of their moods, and a negative significant relationship with the negative emotions sub-dimension. There is a positive significant relationship between the immutability of belief and the procrastination sub-dimension scores of their fixed mindsets, and the negative emotions sub-dimension of their moods, and a negative significant relationship with the positive emotions sub-dimension. According to the research results, individuals' fixed mindsets predict their moods. As individuals' fixed-mindset scores increase, they are in a more positive mood. According to the research results, individuals tend to be in a more positive mood as their growth mindset scores increase. For this reason, activities can be carried out to increase the growth mindset of individuals.

Introduction

Individuals experience a feeling and certain thoughts specific to this feeling, psychological and biological states, and emotions that are a series of action tendencies in their daily lives, such as surprise, joy, sadness, and anger, in the face of the influence of the social environment or certain events (Goleman, 2016). There is a relationship between students'

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similar emotions and their academic motivation, academic success, and performance (Eisenberg et al., 2005; Fried, 2011; Graziano et al., 2007; Kwon et al., 2017; Tamir et al., 2015). Students' sense of belonging to school is predictive of students' academic success (Adelabu, 2007). Furthermore, students' emotions have a positive impact on their high success, academic motivation, and academic self-efficacy, and a negative impact on their school dropout (Anderman, 2002; Booker, 2006; Cemalcılar, 2010; Osterman, 2000). Emotions can be affected by thoughts and perceptions. At the same time, these feelings may arise from the individual's perception and interpretation of the events around him, and it is possible to divide them into two categories: positive and negative. Emotions can be affected by our thoughts and perceptions (Argon, 2015; Daley, 2025). Especially in the theory of rational emotional behavior therapy, there is a cause-effect relationship between thought and emotion. Cognition is the mental processes performed by an individual to understand, comprehend, think, and reason about the world and the events around him (Ahioğlu-Lindberg, 2011; Çarkit & Yalçin, 2018; Fidan, 2012). Individuals' cognitive processes are the primary determinant of human emotion (Rhew et al., 2018). Individuals' cognitive processes can influence their assessment of their intelligence and abilities. Individuals' assessments of their intelligence and abilities are related to mindset theories (Yalçın & Yılmaz, 2023; Yılmaz, 2022). Mindset theory is the beliefs that individuals develop regarding their basic qualities (Dweck, 2016). Individuals' mindset theories are positively related to joyful emotions and negatively related to anxiety (Cheong et al., 2023; Maclntyre & Vincze, 2017). Exploring the relationship between students' mindset theories and their affective states (i.e., negative and positive moods) can provide valuable insights for the field. Accordingly, this study seeks to examine whether individuals' fixed mindsets serve as a predictor of their mood variations. Within this framework, the following research questions were addressed.

(1) Do university students' fixed mindsets predict the positive dimension of their moods?
(2) Do university students' fixed mindsets predict the negative dimension of their moods?

Theoretical Framework

Mindset Theory

Mindset theory is a non-cognitive skill (Yılmaz, 2022), and this skill is the belief that individuals have about their basic characteristics (Dweck, 2016). In mindset theory, mindset is the cognitive framework one has when trying to understand an event (French, 2016). In this respect, mindset is just a belief, and this belief covers the individual's judgments about the flexibility of their character, talents, and intelligence (French, 2016). Mindset theory can be explained as individuals' beliefs about the development of their abilities (Yılmaz, 2022). According to mindset theory, the mindset has a two-dimensional structure (Yılmaz & Güven, 2022), and these are fixed mindset and growth mindset theories (Dweck, 2016). The fixed mindset is the belief that individuals develop that their intelligence is a feature that can develop (Keenan, 2018; Ng, 2018; Orosz et al., 2017). The concept of a fixed mindset suggests that a person's intellectual ability is malleable and can be improved with effort (Cheong et al., 2023). A fixed mindset is a belief that a trait, such as intelligence or talent, can be magnified or improved over time (Yeager & Dweck, 2012). Individuals with a fixed mindset believe that their intelligence or personality cannot change (Ng, 2018). These individuals think that their intelligence is fixed and that learning is of less importance, and they tend to shy away from challenges and are reluctant to confront mistakes or failures. Conversely, those with a growth mindset believe in the potential for improvement, valuing the importance of learning and viewing mistakes as opportunities for growth (Beere, 2019). The fixed mindset, on the other

hand, is characterized by individuals who believe that their mental abilities, characters, and creativity are innate and unalterable, and they make no effort to enhance or modify these traits and often avoid challenging situations due to a fear of making mistakes. As a result, individuals with a fixed mindset may underperform relative to their true capacity (Yılmaz & Güven, 2022). In contrast to the growth mindset, those with a fixed mindset are more likely to evade difficult tasks and feel helpless in challenging situations (Burnette et al., 2013).

Mood

The word emotion comes from the Latin word "emote", meaning action. Emotions are impulses that motivate the individual (Goleman, 2016). Mood is a mood that occurs internally or externally in response to a positive or negative event for the individual (Salovey & Mayer, 1990). Individuals express their feelings as surprise, joy, sadness, anger, etc., and they can live in many different ways. Moods act as internal events that coordinate many psychological subsystems of individuals, such as physiological reactions, cognition, consciousness, and awareness (Yılmaz, & Zembat, 2019). Mood, on the other hand, is the mood created by emotions that tend to be more permanent and at a lower level of intensity for everyone, as the background of individuals' emotions and the colour of their behaviour (Bronner, 2007). Emotion is a long-term general emotional state, while it is a short experience that includes feelings such as anxiety, sadness, anger, and joy that people interpret subjectively (Ekman & Davidson, 1994). Mood is a psychological concept that defines moods such as cognition, motivation, and happiness. The emotions experienced by individuals continue over time, and they evolve into mood, which is the situation experienced (Barsade & Gibson, 2007). Mood refers to a permanent, stable, inclusive feeling that is not related to specific situations (Clark, Watson, & Friston, 2018; Bronner, 2007; Gendolla, 2000; Gross, 1998; Morris, 2000).

Mood has a structure that affects an individual's perception of the world. Having a positive outlook is mostly associated with a positive mood, while a negative mood is also associated with a negative outlook (Çelik & Aydoğdu, 2018; Ekman & Davidson, 1994). The mood reflects people's emotional identity. Individuals provide information about the moods they experience through their emotional identities (Akçay & Çoruk, 2012). Mood explains positive and negative moods (Barsade & Gibson, 2007). Positive moods include emotions such as happiness, joy, and contentment, while negative moods include sadness, anger, and anxiety. However, moods are not limited to this binary classification and can vary in intensity and complexity (Sokolov, & Boucsein, 2000).

Mindset Theories and Mood

Individuals' moods can be affected by variables such as neurotransmitters (serotonin and dopamine), physical health, cognitive processes, personal characteristics, ability to influence the social environment, social interactions, goal-centered feelings, and climatic conditions (Beck, 1963; Bronner, 2007; Harmer, 2008; Reis & Gable, 2003; Steptoe et al., 2008). Cognitive processes, our thoughts, and interpretations of events can affect our mood. Cognitive distortions such as catastrophizing the events encountered by the individual and compulsory thinking can lead to negative moods (Beck, 1997).

A growth mindset is a belief that a trait such as intelligence or personality can change (Clinkenbeard, 2012; Dweck et al., 1995). Most studies on the connection between mindset theory and mood show that mindset theory is positively related to positive moods and negatively related to negative moods such as anxiety (Cheong et al., 2023). At the same time, research shows that mindsets shape meaning-making processes and lead to different goals,

motivations, and behaviors (Clinkenbeard, 2012; Dweck et al., 1995). Growth mindsets act as a buffer against the negative effects of negative life events (Beck, 1997). As can be understood from these explanations, individuals' mindset theories can affect their mood.

Although developmental self-theory has been studied in educational settings, there is increasing interest in describing the relationship between mindsets and psychological problems and emotional states (Kneeland et al., 2016; Schleider et al., 2015; Schroder et al., 2015). This study attempted to describe the relationship between developmental self-theory and emotional states. Explaining the relationship between developmental self-theory and emotional states will contribute to studies in the field.

Method

This study was designed to investigate the predictive relationship between individuals' growth mindset theories and their mood using a correlational design within a quantitative research framework. In line with the purpose of correlational designs that aim to describe the relationship between variables (Creswell, 2013), the study examined college students' mindset theories as independent variables and their mood as dependent variables.

Study Group

The study group of the research was selected from students studying in different faculties of Necmettin Erbakan University using convenience sampling and convenience sampling methods, which are non-probability based. In these sampling methods, it is envisaged that the sample consists of individuals who are voluntary, available, and have a high probability of being reached (Stratton, 2021). Since it was considered impossible to reach all university students during the research process, this sampling method was used. The number of individuals selected with this sampling method is 680. Descriptive findings of the research study group were calculated.

Table 1. *Statistical Data About The Sample Group*

Gender	**Frequency (f)**	**Percentage (%)**
Female	356	52,4
Male	324	47,6
Grade		
1	71	10,4
2	154	22,6
3	219	32,2
4	236	34,8
Age		
18-21	321	47,2
22-25	207	30,4
25 or older	152	22,4
Total	680	1000

52.4% of the study group is female and 47.6% is male. 10.4% of the university students in the study group are in their first year, 22.6% are second year, 32.2% are third year and 34.8% are in their fourth year. 47.2% of the individuals in the study group are between the ages of 18-21, 30.4% are between the ages of 22-25, and 22.4% are aged 25 and over.

Research Tools and Procedures

The study utilized three primary data collection instruments: the Mood Scale, measuring affective states; the Growth Mindset Scale, assessing individuals' implicit theories of ability; and a Personal Information Form, capturing demographic characteristics.

Mood Scale

In this study, a two-part mood scale was used by Yıldırım and Tabak (2019). To determine the frequency of experiencing the mood, a five-point Likert was used (1: Never – 5: Always), and the severity of the mood was a three-point Likert (1: Low, 2: Medium, 3: High). Since mood includes the frequency and intensity of mood, the data was calculated by transforming (mood = frequency of mood x intensity of mood). Calculated mood scores were converted to a five-point Likert scale (1: Hardly at all - 5: Extremely). Factor analyses and item analyses were performed on mood scores. The Mood Scale has two dimensions: negative and positive moods. Cronbach's Alpha (α) internal consistency coefficient of the Mood Scale was found to be between .80 and .85. The internal consistency coefficient for the overall measurement tool was calculated as .82. In the research sample, the Alpha (α) internal consistency coefficient of the measurement tool was calculated as between .83 and .87, and the internal consistency coefficient for the overall measurement tool was calculated as .88.

Mindset Theory Scale

The Growth Mindset Scale, developed by Yılmaz (2022), comprises 13 items. Its four-factor structure, initially identified through exploratory factor analysis, was subsequently validated via confirmatory factor analysis. The reliability coefficients reported for the scale are as follows: .72 for the procrastination sub-dimension, .80 for the immutability of belief sub-dimension, .70 for the effort sub-dimension, .77 for the belief in improvement sub-dimension, .72 for the fixed mindset dimension, and .71 for the growth mindset dimension. The overall reliability coefficient for the entire scale was determined to be .80 (Yılmaz, 2022). In the present study, internal consistency calculations conducted on the research sample yielded the following coefficients: .73 for procrastination, .81 for immutability of belief, .72 for effort, .79 for belief in improvement, .73 for the fixed mindset dimension, and .72 for the growth mindset dimension. The overall reliability coefficient for the scale within this sample was calculated as .81.

Data Collection

The scale was administered face-to-face to students who volunteered to answer the questions in the data collection tool. Clarifications were provided in instances where students experienced comprehension difficulties, encountered challenges, or sought further explanation.

Data Analysis

Prior to analysis, the collected data underwent a preliminary screening for extreme values. Following Tabachnick and Fidell's (2007) methodology, univariate outliers were identified by converting raw scores into z-scores. Consequently, z-scores for all data points were examined, and 11 data points falling outside the ±3 range were excluded from the dataset. Subsequently, the normality assumption of the data distribution was assessed using skewness and kurtosis coefficients.

Table 2. *Normality Values of Data*

Scales	Sub-dimensions	Skewness Coefficient	Kurtosis Coefficient
Mood Scale	Positive moods	.257	.250
	Negative moods	.570	-.321
Fixed mindset	Procrastination	.267	-.079
	Immutability of Belief	.453	-.375
	Effort	-.453	-.069
	Belief in improvement	-.584	-.042

Normality assumptions, skewness, and kurtosis coefficients of the data set collected in the study were examined (Table 3). Skewness and kurtosis coefficients of students' mindset theory, dimensions and sub-dimensions of mindset theory, determination, and sub-dimensions vary between -.609 and .344 and the data set met normal distribution conditions. The normality of the data distribution was established through the assessment of skewness and kurtosis, with values falling within the acceptable range of -2 to +2, as per the criteria outlined by George and Mallery (2016). Consequently, parametric statistical techniques were deemed appropriate for subsequent analyses. Specifically, the Pearson Product Moment Correlation Coefficient was employed to examine the bivariate relationships between independent and dependent variables, while multiple regression analysis was utilized to determine the predictive capacity of the independent variables on the dependent variable. Prior to regression, multicollinearity diagnostics, including variance inflation factors (VIF) below 10 and tolerance values exceeding 0.1, were conducted, along with the Durbin-Watson statistic, which was confirmed to be within the acceptable range of 1.5 to 2.5, indicating the absence of autocorrelation, adhering to the guidelines set forth by Kalaycı (2010). Consistent with established practices in educational research, a significance level of .05, as recommended by Balcı (2004), was adopted for all statistical tests.

Findings

This section presents the findings and interpretations derived from the analyses conducted to address the research objectives. Specifically, the relationships between university students' moods and mindset theories, including their respective sub-dimensions, were examined using the Pearson Product Moment Correlation Coefficient. The outcomes of this correlational analysis are comprehensively detailed in Table 3, which provides a quantitative assessment of the associations between these variables.

Table 3. *The Relationship Between Mindset Theories and Moods*

			Mood	
Scales	**Sub-dimensions**		**Positive moods**	**Negative moods**
Mindset Theories	Belief in improvement	r	.253**	-.107**
	Effort	r	.245**	-.041
	Immutability of Belief	r	-.181**	.190**
	Procrastination	r	-.281**	.287**

*p < .05 **p < .01

There is a positive significant relationship between students' mindset theories, belief in improvement and effort sub-dimension scores, and the positive moods sub-dimension of their mood (p<.01). Between students' mindset theories, the immutability of belief and procrastination sub-dimension scores and the positive moods sub-dimension of their mood. There is a significant positive relationship between the negative moods sub-dimension (p <.01). There is a statistically significant negative relationship (p < .01) between students' mindset theories and their belief in improvement scores, and the negative moods. However, there is no statistically significant relationship (p > .05) between the effort sub-dimension scores of their mindset theories and the negative moods.

The predictive ability of the students' development theories' belief in improvement, effort, immutability of belief, and procrastination sub-dimensions to the variability of their moods in the positive moods sub-dimension was tested with multiple regression analyses. Before performing multiple regression analysis, there was no multicollinearity problem among the independent variables and there was no relationship between the error terms in the analyses performed to test the regression analysis assumptions. According to these results, regression analysis was performed. The results are found in Table 4.

Table 4. *Regression Analysis Results Regarding the Prediction of Growth Mindset Sub-Dimensions to The Positive Moods Sub-Dimension of Mood*

Dependent Variable Mood	Independent variable	ß	t	F	R2	VIF	Durbin-Watson
Positive moods	Fixed	54.004	7.048**	22.264**	.117		1.531
	Belief in improvement	.928	2.272*			1.970	
	Effort	1.571	3.789**			1.215	
	Immutability of belief	.157	.472			1.988	
	Procrastination	-1.268	-4,.286**			1.580	

*p < .05; **p < .01

The regression model created to determine the prediction of the positive moods sub-dimension of students' growth mindsets and moods was found to be statistically significant as a result of the analysis (F=22,264; P<.01). Students' growth mindsets predict 11.7% of the variability in their moods in the positive moods dimension. While the belief in development, effort, and procrastination sub-dimensions of university students' growth mindsets significantly predicted the variability in the positive moods (p<.01), the immutability of belief sub-dimensions did not have a significant prediction (p>.05). When the variability of fixed mindsets in the positive moods sub-dimension of mood is examined in terms of predictive power, the procrastination sub-dimensions of growth mindsets have the greatest predictive power, followed by effort and lastly the belief in improvement sub-dimensions.

VIF and Durbin-Watson values were examined before testing multiple regression analyses to determine whether the students' growth mindset theories' belief in improvement, effort, immutability of belief, and procrastination sub-dimensions predicted the variability of their moods in the positive moods sub-dimension. According to these values, there was no multicollinearity problem between the independent variables and no relationship between the error terms. According to these results, the multiple regression assumptions were met.

Table 5. Regression Analysis Results Regarding The Prediction of The Growth Mindset Sub-Dimensions and The Negative Moods Sub-Dimension of Mood

Dependent Variable Mood	Independent variable	ß	t	F	R2	VIF	Durbin-Watson
Negative moods	Fixed	13.649	1.013	16.422**	.089		1.824
	Belief in improvement	1.134	1.579			1.970	
	Effort	.368	.504			1.215	
	Immutability of belief	.962	1.642			1.988	
	Procrastination	3.218	6.187**			1.580	

*p < .05; **p < .01

The regression model created to determine the prediction of the negative moods sub-dimension of students' growth mindsets and moods was found to be statistically significant as a result of the analysis (F=16.422; P<.01). Students' growth mindsets predict 8.9% of the variability of their moods in the negative moods dimension. While the procrastination sub-dimension of university students' growth mindsets significantly predicted the variability in the negative moods sub-dimension of their moods (p<.01), the belief in development, effort, and immutability of belief sub-dimensions did not have a significant prediction (p>.05).

Discussion

There is a positive significant relationship between the belief in improvement and effort sub-dimension scores of individuals' growth mindsets and the positive moods sub-dimension of their mood and a negative significant relationship with the negative moods sub-dimension. There is a positive relationship between the immutability of belief and procrastination sub-dimension scores of their growth mindsets and the negative moods sub-dimension of their mood and a negative significant relationship with the positive moods sub-dimension. While students' growth mindsets predict 11.7% of the variability in the positive moods dimension of their mood, the negative moods sub-dimension predicts 8.9% of the variability in size. According to the predictive power of the sub-dimensions of growth mindsets, procrastination, effort and belief in improvement respectively predict the sub-positive moods, while immutability of belief does not have a significant predictive power. While the procrastination sub-dimension of the growth mindset significantly predicts the variability in the negative moods sub-dimension of emotional states, the other sub-dimensions do not have a significant prediction.

Individuals' beliefs that they can improve their intellectual competence can enable them to develop a positive perspective on themselves (Yılmaz, 2022). In the research, it is the procrastination dimension that is the most predictive of individuals' moods in terms of the sub-dimensions of the growth mindset. Procrastination can be defined as an individual's tendency to postpone their actions and plans for some reasons, and feeling stagnant and lazy (Sekman, 2007). Procrastination is a problem caused by individual reasons and stems from individuals not wanting to easily abandon their habits, truths, and value judgments (Schein, 1990). Based on these explanations, we can assume that procrastination may cause the individual not to give up routines and habits and to develop resistance to change. This state of procrastination will prevent dissatisfaction and achievement (Aslan & Şeker Kayar, 2023). Procrastination, which occurs when an individual forces himself to feel certain moods, can result in burnout by causing fatigue, reluctance, and weakness in individuals (Demir, 2018; Sekman, 2014). Individuals in procrastination may experience insufficient motivation, lack of self-control, lack of empathy

and socialization, and a sense of learned helplessness (Çankaya, 2010). The fact that these moods are negative and these explanations support the research results. Studies have also found a relationship between procrastination and negative moods (Alessandri et al., 2021; Houben et al., 2015; Kuppens et al., 2010; Pichon et al., 2015; Suls et al., 1998; Thompson et al., 2012). The results of these studies are parallel to the study's finding that the procrastination dimension of the developmental theory predicts mood.

According to the research results, the effort dimension of individuals' growth mindsets explains their positive mood. Effort is related to work, effort, and desire to work (TDK, 2020). Effortful individuals can be willing to do any job and are undaunted (Yılmaz, 2022). Effortful individuals are excited and enthusiastic (Özdemir, 2013). Based on these explanations, we can assume that individuals who strive to improve their abilities may be in a positive mood.

The inertia dimension of the developmental self-theory may be related to individuals' inability to take action, to not taking any action, and to not owning the necessary amount of energy to complete a task. This situation may be thought to be related to the individual's negative emotions such as depression and dejection.

In a study conducted by Bosman et al. (2005), individuals' efforts while playing the power-to-take game explained their positive and negative moods. Patrick et al. (2001) noted a relationship between effort in learning strategies and emotions in their study aimed to examine the situations attributed to university students' failure in biology courses. Effort-related items of the scale used in the research are associated with pushing oneself to do and learn new things, trying to learn from my mistakes, and learning from the successes of the people around me, and these items are related to the personal development of the individual. Armenta et al. (2017) explored that gratitude especially encourages the individual to make more efforts toward self-improvement. Some studies found that positive moods such as gratitude make individuals determined to improve themselves, believe that they deserve positive results, encourage them to move towards their goals, and lead them to take action for success (Emmons, 2007; Emmons & McCullough, 2003; Emmons & Mishra, 2011; Lambert et al., 2009). Thus, the individual's desire to improve his abilities, trying to learn from his mistakes in this process, and being in effort and development, such as trying to learn from the actions of successful people, can predict his feelings.

Tamir et al. (2007) explored the relationship between the growth mindsets of university students and negative moods such as sadness and suffering. In this study, developmental self-theories were positively related to positive moods and negatively to negative moods and depression. De Castella et al. (2014) found in a sample of participants with a social anxiety disorder that individuals with a stronger fixed mindset had higher levels of perceived stress and anxiety. Miu and Yeager (2015) noted that programs aimed at improving a growth mindset reduced the incidence of depressive symptoms. Schleider et al. (2015) highlighted that a growth mindset had a negative impact on psychological distress. Burnette et al. (2013) indicated that a fixed mindset affects situations such as negative affect and coping in success areas. In the meta-analysis study conducted by Burnette et al. (2020) (k = 72 samples, N = 17,692), the growth mindset affects coping with negative moods and has a negative relationship with negative moods. In the study conducted by Schroder et al. (2017), the number of stressful life events, post-traumatic stress symptoms, depression, substance use, and suicidal tendencies are less common in individuals with a fixed mindset compared to growth mindsets. These results are parallel to the research findings.

As a result, according to the research results, individuals' growth mindsets predict their moods. This is an expected result. Individuals' belief that they can improve their abilities, and intelligence may affect their experience of more positive and negative moods. Individuals who believe that they can improve their abilities and intelligence may not experience hopelessness and helplessness, and this situation may make them feel more positive moods. Individuals who think they cannot develop these abilities may feel hopeless, helpless, and exhausted. In this case, it may cause them to feel negative moods.

According to the research results, individuals are in a more positive mood as their growth mindset scores increase. For this reason, activities can be carried out to increase the growth mindset of individuals, and this research was designed and carried out according to the correlation design. In other studies, the effect of intervention programs aimed at increasing growth mindsets on emotional expressions can be tested with experimental designs. Since developmental autonomy affects the emotional states of individuals, studies can be conducted to inform the society on this subject. Psychoeducation practices can be developed on this subject.

Declarations

Acknowledgments: The authors would like to thank all students for their support and voluntary participation in the data collection process.
Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.
Conflict of Interest: The authors declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.
Informed Consent: It was emphasized that the study was based on volunteering and that confidentiality was important, and participants were informed that they could not participate in the study if they did not want to.
Data availability: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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