

# The Mediating Role of Psychological Resilience in the Effect of Academic Stress on Attitudes Toward Sport Among University Students

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## Research Article

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# Abstract

## Background

University students may experience academic stress due to academic performance expectations, course workload, examination pressure, and uncertainty about the future. The association between academic stress and students' health-related lifestyle orientations can be examined through attitudes toward sport. Psychological resilience, defined by the capacity to maintain functioning and recover under stressful conditions, may serve as an explanatory variable in this association. This study tested the mediating role of psychological resilience in the effect of academic stress on attitudes toward sport among university students.

## Methods

This cross-sectional correlational study included 391 university students selected through convenience sampling. Data were collected using a personal information form, the Educational Stress Scale, the Sport-Oriented Attitude Scale, and the Brief Resilience Scale. Descriptive statistics, Cronbach's alpha coefficients, Pearson correlation analysis, linear regression, and bootstrap-based mediation analysis were used. The mediation model was examined using IBM SPSS Statistics 27 and PROCESS macro 5.0 Model 4, and the indirect effect was calculated with 5,000 bootstrap samples.

## Results

Academic stress, psychological resilience score, and attitude toward sport were positively and significantly correlated. Academic stress significantly predicted psychological resilience score ( $B = 0.164$ ,  $\beta = 0.434$ ,  $p < 0.001$ ). The total effect of academic stress on attitude toward sport was significant ( $B = 0.660$ ,  $\beta = 0.371$ ,  $p < 0.001$ ). When psychological resilience score was added to the model, both the direct effect of academic stress ( $B = 0.389$ ,  $\beta = 0.219$ ,  $p < 0.001$ ) and the effect of psychological resilience score ( $B = 1.649$ ,  $\beta = 0.351$ ,  $p < 0.001$ ) remained significant. The indirect effect was significant ( $B = 0.271$ ,  $\text{BootSE} = 0.059$ , 95%  $\text{BootCI} [0.161, 0.390]$ ).

## Conclusions

Psychological resilience score partially mediated the association between academic stress and attitude toward sport. No causal inference was made because of the cross-sectional design. Examining academic stress and psychological resilience together may provide applicable evidence for student support programs aimed at attitudes toward sport among university students.

## 1. Introduction

## **1.1. Academic stress among university students**

The university period is a developmental stage in which academic demands increase, performance evaluations become continuous, and students are required to use time management, self-regulation, and psychological adjustment capacities simultaneously. Academic stress refers to the psychological strain that arises when students perceive expectations and tasks from the educational environment as demands that challenge their personal resources [1–5]. Academic stress is a multidimensional construct comprising pressure from study, workload, worry about grades, self-expectation, and despondency [5]. Studies conducted in higher education samples have reported associations of academic stress with lower psychological well-being, depressive symptoms, anxiety, sleep problems, and impaired academic functioning [1–4, 6, 7]. This literature indicates that academic stress is not restricted to educational performance but may also relate to students' daily lives and orientation toward health-supportive behaviors.

The effects of academic stress on students are not uniform. The way stress is appraised, the student's coping resources, the level of social support, and behavioral regulation skills may change stress-related outcomes [1, 2]. Models that examine the role of psychological resources in the relationship between academic stress and attitudes toward healthy lifestyle behaviors therefore have relevance for higher education settings.

## **1.2. Attitude toward sport and physical activity orientation**

Attitude is a psychological construct that includes cognitive, affective, and behavioral tendencies toward a specific object, behavior, or activity domain. The Theory of Planned Behavior proposes that attitude toward a behavior is one of the key determinants of behavioral intention and behavioral participation [8]. Meta-analytic studies in the field of physical activity have reported that attitude and intention are associated with exercise behavior [9, 10].

Attitude toward sport includes students' interest in sport activities, the perception of sport as part of life, and behavioral tendencies toward active participation in sport. Reviews and meta-analyses examining the associations of physical activity and sport participation with stress, psychological well-being, depressive symptoms, and anxiety have reported that regular physical activity is related to mental health indicators in university students and other young adult samples [11–14].

During periods of intense academic demands, students' attitudes toward sport may be examined not only as a leisure preference but also as a psychological orientation toward stress management and health-supportive behavior. A positive attitude toward sport is associated with perceiving physical activity as valuable, feasible, and compatible with one's life routine [8–11].

## **1.3. Psychological resilience**

Psychological resilience is a dynamic adaptive process explained by the capacity to maintain functioning, adapt, and recover in the face of stressful, traumatic, or challenging life events [15–19]. In

the resilience literature, the construct is not treated as complete immunity to adversity, but as the maintenance or restoration of adaptation under risk or stress conditions [15, 16].

The Brief Resilience Scale focuses on measuring resilience as an individual's ability to recover after stressful experiences [20]. This measurement approach treats resilience not solely as a personality trait but as a tendency to return to previous functioning after stress. Among students experiencing academic stress, psychological resilience may serve as a meaningful psychological resource for maintaining behavioral regulation and orientation toward health-supportive activities [15–20].

## **1.4. Aim and hypotheses of the study**

Academic stress, psychological resilience, and attitude toward sport have mostly been examined in separate models in the literature. Studies testing the mediating role of psychological resilience in the effect of academic stress on attitude toward sport are limited. The aim of this study was to examine the mediating role of psychological resilience in the effect of academic stress on attitude toward sport among university students.

H1: Academic stress is positively and significantly associated with attitude toward sport.

H2: Academic stress is positively and significantly associated with psychological resilience.

H3: Psychological resilience is positively and significantly associated with attitude toward sport.

H4: Psychological resilience mediates the relationship between academic stress and attitude toward sport.

## **2. Methods**

### **2.1. Research design**

The study was conducted with a cross-sectional correlational design within the quantitative research approach. A cross-sectional design is based on measuring variables at a single time point; therefore, relationships among variables rather than causal temporal ordering are examined [21]. In the model, academic stress was defined as the independent variable, attitude toward sport as the dependent variable, and psychological resilience as the mediator. Mediation analysis is a regression-based approach used to test whether the relationship between an independent variable and a dependent variable is carried indirectly through a third variable [33–35].

### **2.2. Population, sample, and sample size**

The target population of the study consisted of university students enrolled in higher education institutions in Türkiye. The accessible population consisted of university students who could be reached by the researchers during the data collection period. The sample was determined through convenience sampling based on voluntary participation. Convenience sampling is a non-probability sampling

approach in which individuals who are accessible and agree to participate are included; its limitation for generalizability should be clearly stated [22].

Sample size adequacy was examined using a power-sensitivity approach for a multiple regression model. In a regression model with two predictors, approximately 312 participants are considered sufficient to test a small-to-medium effect size ( $f^2 = 0.05$ ) at  $\alpha = 0.05$  and 95% power [23, 24]. The sample size of 391 participants in this study exceeded this threshold. Inclusion criteria were being a university student, providing voluntary informed consent, and completing the data collection forms without missing data.

## **2.3. Participants**

A total of 391 university students participated in the study. Of the participants, 273 were women (69.8%) and 118 were men (30.2%). By age group, 166 students were aged 18–21 years (42.5%), 169 were aged 22–25 years (43.2%), and 56 were aged 26 years or older (14.3%). Regarding sport participation, 207 participants reported doing sport (52.9%), whereas 184 reported not doing sport (47.1%).

Table 1  
Demographic characteristics of participants

| Variable              | Category                                       | n   | %    |
|-----------------------|------------------------------------------------|-----|------|
| Gender                | Women                                          | 273 | 69.8 |
|                       | Men                                            | 118 | 30.2 |
| Age group             | 18–21                                          | 166 | 42.5 |
|                       | 22–25                                          | 169 | 43.2 |
|                       | 26 and above                                   | 56  | 14.3 |
| Department/Faculty    | School of Physical Education and Sports        | 77  | 19.7 |
|                       | State Conservatory / Faculty of Art and Design | 70  | 17.9 |
|                       | Faculty of Arts and Sciences                   | 105 | 26.9 |
|                       | Faculty of Theology                            | 39  | 10.0 |
|                       | Other                                          | 100 | 25.6 |
| Year of study         | First year                                     | 110 | 28.1 |
|                       | Second year                                    | 75  | 19.2 |
|                       | Third year                                     | 89  | 22.8 |
|                       | Fourth year                                    | 117 | 29.9 |
| Employment status     | Yes                                            | 132 | 33.8 |
|                       | No                                             | 259 | 66.2 |
| Family income level   | Low                                            | 118 | 30.2 |
|                       | Medium                                         | 233 | 59.6 |
|                       | High                                           | 40  | 10.2 |
| Sport participation   | Yes                                            | 207 | 52.9 |
|                       | No                                             | 184 | 47.1 |
| Sport branch          | I do not do sport                              | 184 | 47.1 |
|                       | Individual sport                               | 129 | 33.0 |
|                       | Team sport                                     | 78  | 19.9 |
| Weekly sport duration | I do not do sport                              | 184 | 47.1 |
|                       | 1–2 hours per week                             | 67  | 17.1 |
|                       | 3–4 hours per week                             | 91  | 23.3 |

| Variable | Category                 | n  | %    |
|----------|--------------------------|----|------|
|          | 5 hours or more per week | 49 | 12.5 |

## 2.4. Data collection instruments

### 2.4.1. Personal information form

The personal information form included questions about gender, age group, department/faculty, year of study, weekly time spent at school, employment status, family income level, sport participation status, sport branch, and weekly sport duration.

### 2.4.2. Educational Stress Scale

Academic stress was measured using the Educational Stress Scale. The original scale was developed by Sun et al. and a 16-item, five-factor structure was reported: pressure from study, workload, worry about grades, self-expectation, and despondency [5]. In the Turkish adaptation study, the five-factor structure of the scale was confirmed, and the Cronbach's alpha coefficient for the total scale was reported as 0.86 [25]. In the present study, Cronbach's alpha for the total scale was 0.889. Alpha coefficients for the subdimensions were 0.627 for pressure from study, 0.700 for workload, 0.676 for worry about grades, 0.753 for self-expectation, and 0.810 for despondency.

### 2.4.3. Sport-Oriented Attitude Scale

Attitude toward sport was measured using the Sport-Oriented Attitude Scale. The scale was developed to determine individuals' attitudes toward sport activities and is a 5-point Likert-type instrument [26]. In the scale development study, a 25-item, three-factor structure was obtained: interest in sport, living with sport, and active sport participation. The total reliability coefficient of the scale was reported as 0.972 [26]. In the present study, Cronbach's alpha for the total scale was 0.953. Alpha coefficients for the subdimensions were 0.901 for interest in sport, 0.857 for living with sport, and 0.843 for active sport participation.

### 2.4.4. Brief Resilience Scale

Psychological resilience was measured using the Brief Resilience Scale. The original form of the scale was developed by Smith et al. to measure the individual capacity to bounce back after stressful experiences [20]. In the Turkish adaptation study, the scale was reported to be a 6-item, 5-point Likert-type, self-report measure with a one-factor structure; after reverse-coded items are recoded, higher scores indicate higher psychological resilience [27]. In the present study, Cronbach's alpha for the scale was 0.691.

## 2.5. Ethics approval and data collection procedure

The study was conducted in accordance with the principles of the Declaration of Helsinki [36]. The study was found scientifically and ethically appropriate by the Social and Human Sciences Ethics Committee

of Dicle University. The ethics committee application date was 15/12/2025, and the meeting date and decision number were 19/12/2025 – 561. The Rectorate approval was issued on 24/12/2025 with number 1060286, and the official letter was issued on 25/12/2025 with number E-14679147-663.05-1061836. Participants were informed about the purpose of the study, voluntary participation, confidentiality, and their right to withdraw from the study at any time. Informed consent was obtained from all participants.

## **2.6. Data analysis**

Data were analyzed using IBM SPSS Statistics 27 and PROCESS macro 5.0. Missing data checks, descriptive statistics, and normality assessment were performed before the main analyses. Skewness and kurtosis coefficients were used for the normality assessment; in social sciences, skewness and kurtosis values within acceptable ranges are considered in relation to the distributional assumption for parametric analyses [30, 31].

The internal consistency of the scales was examined using Cronbach's alpha coefficient [28, 29]. Relationships among variables were analyzed using Pearson correlation coefficients [30]. The predictive effects of academic stress on psychological resilience and attitude toward sport were tested using linear regression analysis [30, 31]. The mediating role of psychological resilience was examined using PROCESS Model 4 [33]. The significance of the indirect effect was evaluated using 95% confidence intervals calculated from 5,000 bootstrap samples. A confidence interval that did not include zero was used as the criterion for statistical significance of the indirect effect [34, 35]. p values were interpreted as two-tailed.

## **3. Results**

### **3.1. Preliminary analyses and descriptive statistics**

No missing data were found for the analysis variables. Skewness and kurtosis were 0.408 and 1.300 for the academic stress total score, 0.076 and 0.601 for the attitude toward sport total score, and – 0.456 and 4.152 for the psychological resilience total score, respectively. These values were within acceptable limits for parametric analyses.

Table 2  
Descriptive statistics for study variables

| Variable                       | N   | Min.  | Max.   | Mean  | SD    |
|--------------------------------|-----|-------|--------|-------|-------|
| Academic stress total          | 391 | 16.00 | 80.00  | 48.37 | 10.70 |
| Pressure from study            | 391 | 1.00  | 5.00   | 2.96  | 0.78  |
| Workload                       | 391 | 1.00  | 5.00   | 2.97  | 0.86  |
| Worry about grades             | 391 | 1.00  | 5.00   | 3.07  | 0.87  |
| Self-expectation               | 391 | 1.00  | 5.00   | 2.94  | 0.89  |
| Despondency                    | 391 | 1.00  | 5.00   | 3.18  | 0.93  |
| Attitude toward sport total    | 391 | 25.00 | 125.00 | 82.53 | 19.04 |
| Interest in sport              | 391 | 1.00  | 5.00   | 3.30  | 0.77  |
| Living with sport              | 391 | 1.00  | 5.00   | 3.26  | 0.82  |
| Active sport participation     | 391 | 1.00  | 5.00   | 3.35  | 0.82  |
| Psychological resilience total | 391 | 6.00  | 30.00  | 18.16 | 4.06  |

## 3.2. Reliability analysis

Cronbach's alpha coefficients are presented in Table 3. The total score reliability coefficients for academic stress and attitude toward sport were high. The alpha coefficient for the psychological resilience scale was 0.691.

Table 3  
Cronbach's alpha coefficients for the scales

| Scale / Subdimension           | Number of items | Cronbach's alpha |
|--------------------------------|-----------------|------------------|
| Academic stress total          | 16              | 0.889            |
| Pressure from study            | 3               | 0.627            |
| Workload                       | 3               | 0.700            |
| Worry about grades             | 3               | 0.676            |
| Self-expectation               | 3               | 0.753            |
| Despondency                    | 3               | 0.810            |
| Attitude toward sport total    | 25              | 0.953            |
| Interest in sport              | 12              | 0.901            |
| Living with sport              | 7               | 0.857            |
| Active sport participation     | 6               | 0.843            |
| Psychological resilience total | 6               | 0.691            |

### 3.3. Correlation analysis

Pearson correlation analysis showed a positive and significant association between academic stress and psychological resilience ( $r = 0.434$ ,  $p < 0.001$ ). The association between academic stress and attitude toward sport was positive and significant ( $r = 0.371$ ,  $p < 0.001$ ). A positive and significant association was also found between psychological resilience and attitude toward sport ( $r = 0.446$ ,  $p < 0.001$ ).

Table 4  
Correlations among main variables

| Variable                                 | 1       | 2       | 3 |
|------------------------------------------|---------|---------|---|
| 1. Academic stress                       | 1       |         |   |
| 2. Psychological resilience              | 0.434** | 1       |   |
| 3. Attitude toward sport                 | 0.371** | 0.446** | 1 |
| <b>Note. **<math>p &lt; 0.01</math>.</b> |         |         |   |

### 3.4. Mediation analysis

Academic stress significantly predicted psychological resilience score ( $B = 0.164$ ,  $SE = 0.017$ ,  $\beta = 0.434$ ,  $t = 9.493$ ,  $p < 0.001$ , 95% CI [0.130, 0.198]). The explained variance of the model was  $R^2 = 0.188$ . The total

effect of academic stress on attitude toward sport was significant ( $B = 0.660$ ,  $SE = 0.084$ ,  $\beta = 0.371$ ,  $t = 7.877$ ,  $p < 0.001$ , 95% CI [0.496, 0.825]);  $R^2 = 0.138$  in this model.

When academic stress and psychological resilience were included in the same model, the model was significant ( $F(2,388) = 60.503$ ,  $p < 0.001$ ) and explained 23.8% of the variance in attitude toward sport. The direct effect of academic stress was significant ( $B = 0.389$ ,  $SE = 0.088$ ,  $\beta = 0.219$ ,  $t = 4.444$ ,  $p < 0.001$ , 95% CI [0.217, 0.561]). Psychological resilience score also positively predicted attitude toward sport ( $B = 1.649$ ,  $SE = 0.231$ ,  $\beta = 0.351$ ,  $t = 7.140$ ,  $p < 0.001$ , 95% CI [1.195, 2.104]).

In the bootstrap mediation analysis, the indirect effect was significant ( $B = 0.271$ ,  $BootSE = 0.059$ , 95% BootCI [0.161, 0.390]). Because the direct effect of academic stress remained significant after the mediator was included in the model, the mediation was partial.

Table 5  
Regression results for the mediation model

| Path                                                     | B     | SE    | $\beta$ | t     | p       | 95% CI         |
|----------------------------------------------------------|-------|-------|---------|-------|---------|----------------|
| Academic stress -> Psychological resilience              | 0.164 | 0.017 | 0.434   | 9.493 | < 0.001 | [0.130, 0.198] |
| Academic stress -> Attitude toward sport (total effect)  | 0.660 | 0.084 | 0.371   | 7.877 | < 0.001 | [0.496, 0.825] |
| Academic stress -> Attitude toward sport (direct effect) | 0.389 | 0.088 | 0.219   | 4.444 | < 0.001 | [0.217, 0.561] |
| Psychological resilience -> Attitude toward sport        | 1.649 | 0.231 | 0.351   | 7.140 | < 0.001 | [1.195, 2.104] |

Table 6  
Bootstrap indirect effect result

| Indirect path                                                        | Effect | BootSE | BootLLCI | BootULCI |
|----------------------------------------------------------------------|--------|--------|----------|----------|
| Academic stress -> Psychological resilience -> Attitude toward sport | 0.271  | 0.059  | 0.161    | 0.390    |

## 4. Discussion

The study found positive and significant associations among academic stress, psychological resilience score, and attitude toward sport. In the mediation analysis, psychological resilience score served as a partial mediator in the relationship between academic stress and attitude toward sport. The statistical model showed that the association between academic stress and attitude toward sport consisted of both a direct effect and an indirect effect through psychological resilience.

The positive association between academic stress and attitude toward sport should be interpreted considering the characteristics of the sample and the cross-sectional design. The literature has reported

that academic stress is associated with psychological distress and lower well-being among students [1–4, 6, 7]. In the present sample, more than half of the participants reported doing sport, which may indicate that sport functions for some students as a regulatory lifestyle behavior in response to academic demands. This interpretation is not causal and is limited to an explanation consistent with the present cross-sectional data.

Academic stress positively predicted psychological resilience score. This finding can be interpreted through the definition of resilience as the capacity to maintain functioning and recover under stressful conditions [15–20]. The resilience literature emphasizes that psychological resilience is not defined in the absence of stress but through adaptive capacity observed under risk or challenge [15, 16, 19]. The increase in psychological resilience score with increasing academic stress in the present data may relate to students' use of psychological resources when facing academic demands. The short-form structure of the scale and the borderline reliability coefficient should be considered when interpreting this finding.

Psychological resilience score positively predicted attitude toward sport, a finding consistent with the literature on physical activity and mental health. Systematic reviews have reported that physical activity is associated with stress, academic performance, and psychological well-being [11–13]. The association of attitude toward sport with behavioral intention and physical activity participation is compatible with the attitude-behavior link described in the Theory of Planned Behavior and physical activity models [8–10].

The significant indirect effect in the mediation analysis indicated that psychological resilience score statistically mediated the relationship between academic stress and attitude toward sport. Since both the total effect and the direct effect were significant, the mediation was partial [33–35]. This finding shows that the association between academic stress and attitude toward sport was partly explained by psychological resilience score, while other explanatory variables may also be relevant. Future models may examine variables such as social support, self-regulation, exercise self-efficacy, physical activity habits, and time management.

## **4.1. Limitations**

The cross-sectional design of the study does not allow causal temporal ordering among variables [21]. The sample was determined using convenience sampling, which limits generalization of the findings to all university students [22]. Data were collected through self-report scales; therefore, social desirability and common method bias cannot be ruled out. The gender distribution was not balanced, with a higher proportion of women than men. The Cronbach's alpha coefficient of the Brief Resilience Scale in this study was 0.691; although alpha can be affected by the number of items in short scales, this value should be considered as a limitation when interpreting the findings [28, 29].

## **4.2. Practice and research implications**

Academic stress, psychological resilience, and attitude toward sport can be considered together in university settings. Programs implemented by psychological counseling units, sport sciences units, and student support centers may integrate stress management, resilience skills, and regular physical activity participation within the same intervention framework. Future research may use longitudinal designs, multicenter samples, objective physical activity measurements, and multigroup analyses. Testing the mediation model separately among students who do and do not participate in sport may clarify the student groups for whom the model operates more strongly.

## 5. Conclusions

Academic stress was positively associated with attitude toward sport, and psychological resilience score served as a partial mediator in this relationship. The total effect of academic stress on attitude toward sport was significant; when psychological resilience was included in the model, the direct effect remained significant and the indirect effect was significant according to bootstrap confidence intervals. The findings were not interpreted causally because of the cross-sectional design. Joint examination of academic stress and psychological resilience may be useful in studies aimed at strengthening attitudes toward sport among university students.

## Declarations

### Ethical approval

This study was approved by the Presidency of the Social and Human Sciences Ethics Committee of Dicle University. The ethics committee application date was 15/12/2025, and the ethics committee meeting date and decision number were 19/12/2025-561. The Rectorate approval was issued by Dicle University Rectorate on 24/12/2025 with approval number 1060286, and the official letter was issued on 25/12/2025 with number E-14679147-663.05-1061836. The study was conducted in accordance with the World Medical Association Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects and the Higher Education Institutions Scientific Study and Publication Ethics Directive.

### Consent to participate

Informed consent was obtained from all participants included in the study. Participation was voluntary, and no identifying personal information was collected.

### Consent to publish

Not applicable. No photographs, identifying images, or personal identity information of participants were collected or included in the manuscript.

### Availability of data and materials

The dataset used in this study is not publicly available due to participant confidentiality and ethical restrictions. The data are available from the corresponding author upon reasonable request.

### **Competing interests**

The authors declare that they have no competing interests.

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This study received no financial support from any institution or organization.

### **Authors' contributions**

EÖ, MA, and HK contributed to the study design. EÖ and MA conducted the data collection process. MA and HK checked the statistical analyses. EÖ, MA, and HK reviewed the manuscript draft. All authors read and approved the final manuscript. [Authors' contributions should be checked against the actual task distribution before submission.]

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