Journal Website

Article history:
Received 07 July 2024
Revised 11 September 2024
Accepted 10 October 2024
Published online 29 Dec. 2024

Iranian Journal of Neurodevelopmental Disorders

Volume 3, Issue 4, pp 53-64

Journal of Neurodevelopmental Disorder

E-ISSN: 2980-9681

Investigating the Effect Model of Defense Mechanisms and Coping Skills on Entrance Exam Anxiety in Adolescent Girls with Generalized Anxiety Disorder (GAD) with the Mediating Role of Resilience

Hanie Almasian[1] , Mina Bayat[2] , Sara Abdi[3], Sara Zakerin [4], Zahra Kazemi [5*]

1. Department of the Psychology and Education of Exceptional Children, Central Tehran Branch, Islamic Azad University, Tehran, Iran.
2. Department of Psychology, Ashtian Branch, Islamic Azad University, Markazi Province, Iran.
3. Department of psychology, Tehran Branch, Islamic Azad University, Tehran, Iran.
4. Department of Psychology, Science and Research Branch, Islamic Azad University, Tehran, Iran.
5. Department of Psychology, Tehran Branch, Islamic Azad University, Tehran, Iran (Corresponding author).

*** Corresponding author email address**: z.k13982019@gmail.com

A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Almasian H, Bayat, M., Abdi S, Zakerin S, Kazemi Z. (2024). Investigating the Effect Model of Defense Mechanisms and Coping Skills on Entrance Exam Anxiety in Adolescent Girls with Generalized Anxiety Disorder (GAD) with the Mediating Role of Resilience. *Iranian Journal of Neurodevelopmental Disorders*, *3*(4), 53-64.
https://doi.org/10.61838/kman.jndd.3.4.6

© 2024 the authors. Published by Iranian Association for Intelligence and Talent Studies, Tehran, Iran. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

A B S T R A C T

Purpose: This study aims to examine how defense mechanisms and coping strategies influence entrance exam anxiety in adolescent girls with generalized anxiety disorder, with a focus on the mediating role of resilience.

Methodology: The present study falls under the category of descriptive-correlational research and utilizes a cross-sectional research design, employing structural equation modeling (SEM) and mediating variable analysis. The statistical population for this study consisted of all adolescent girls with generalized anxiety disorder (GAD) at the pre-university level in Tehran from May to November 2024. A sample of 141 adolescent girls was selected using purposive sampling. The research instruments used include the coping strategies questionnaire (CSQ), Connor-Davidson Resilience Scale (CD-RISC), defense style questionnaire (DSQ-40), and Test Anxiety Questionnaire (TAQ). Data analysis was performed with SPSS version 27 and Smart PLS 4 software, applying the structural equation model method. Statistical analysis was conducted using a P-value of 0.05.

Findings: The research results showed that problem-solving by being resilient had a notable adverse effect on exam anxiety (β=-0.053, P=0.040). Having an Immature defensive style was also found to boost exam anxiety through resilience, as indicated by a noteworthy positive impact (β=-0.067, P=0.010). It is evident that by increasing resilience, individuals can lessen the impact of an immature defensive style on exam anxiety. The study revealed that the problem-solving significantly increased resilience with a beta coefficient of 0.187 and p-value of 0.022. On the other hand, the emotional restraint aspect had a significant negative impact on anxiety (β=-0.308, p=0.000). Attracting social support was discovered to have a notable adverse effect on anxiety, according to the study findings (β=-0.129, P=0.047).

Conclusion: The results of this study demonstrated that enhancing coping mechanisms, immature defensive style, and building resilience can be beneficial in assisting students dealing with anxiety during entrance exams, with mental resilience being a key focus for interventions aimed at enhancing mental well-being.

Keywords: *Defense Mechanisms, Coping Skills, Test Anxiety, Generalized Anxiety Disorder, Resilience*

1. Introduction

Anxiety is a common experience for everyone and can serve as a motivation for increased effort, but when it becomes excessive, it can lead to dysfunction (Sun et al., 2021). Among adolescents, exam anxiety can be a source of mental and emotional pressure, especially for those preparing for entrance exams, with about 80% of these students experiencing varying levels of anxiety (Motallebi et al., 2023). Experiencing exam anxiety is marked by feelings of concern, lack of organization, and physical manifestations like a faster heartbeat, clammy hands, and trouble focusing on school-related tasks (Azimifar & Zahmatkesh, 2021). Statistics show that 6.5% of adolescents worldwide suffer from anxiety disorders, with evidence suggesting that adolescent girls are more likely to be affected than boys (Sun et al., 2021). Research indicates that there are gender differences in test anxiety, with girls more likely to acknowledge their anxiety, and the ratio of women to men among those experiencing test anxiety is two to one (Hinds & Sanchez, 2022).

The psychological stress experienced by adolescents during their educational years, particularly about exam anxiety, can contribute to the development and persistence of anxiety disorders. While the pressure and anxiety commonly experienced in school may be manageable for a typical adolescent, it can be overwhelming for individuals with generalized anxiety disorder. This condition involves overwhelming anxiety and fear regarding unspecified situations or events daily for a minimum of six months, frequently resulting in challenges with managing these emotions and creating discomfort in both social and work environments. Research indicates that approximately 272.2 million individuals worldwide have been diagnosed with anxiety disorders, with a higher prevalence among women compared to men. Furthermore, anxiety disorders typically manifest during youth and early adulthood, making students and young adults particularly vulnerable to generalized anxiety disorder (Byrd-Bredbenner et al., 2020). A study revealed that factors such as the behavioral inhibition system, worry, and rumination play a significant role in the development of generalized anxiety disorder among students (Alghadir et al., 2020). Additionally, research has shown a strong association between generalized anxiety disorder and the risk of suicide among students (Pour & Mansouri, 2021).

Students need defense mechanisms to preserve and equilibrium their mental health. Without these mechanisms, the mind becomes more susceptible to negative emotions like anxiety and worry (Trindade et al., 2021). These mechanisms help reduce conflict and cognitive dissonance during sudden changes in internal and external circumstances, preventing anxiety or depression (Tabe Bordbar & Kaveh, 2021). Research indicates that defense mechanisms act as protective factors against psychological distress and symptom development (Vaillant, 2020). Additionally, high levels of immature defense mechanisms can worsen symptoms of anxiety and depression (Ferrajão et al., 2022).

In instances of elevated anxiety, possessing coping skills can aid students in effectively managing anxiety and enhancing performance. Coping skills are behavioral and cognitive strategies that assist in minimizing the effects of stress (Prekazi et al., 2021). A study demonstrated that coping skills play a crucial role in diminishing symptoms of depression and anxiety (Buffart et al., 2020). Additionally, research suggests that receiving sufficient social support and undergoing training in positive coping skills can lead to a reduction in anxiety levels (Zhu et al., 2020).

Students are required to not only study for entrance exams but also encounter a range of stresses and obstacles. Mental resilience, defined as the ability to successfully adapt to difficult life experiences through mental, emotional, and behavioral flexibility, is crucial for students' well-being and performance (Darbani & Parsakia, 2023; Fullerton et al., 2021; Golparvar & Parsakia, 2023). High levels of psychological resilience can help students bounce back from negative emotions and experience more positive emotions (Liu et al., 2021). Research has shown that resilience impacts stress, depression, and anxiety among students (Devi et al., 2021). Additionally, studies have found that psychological resilience mediates the relationship between emotion regulation and test anxiety (Liu et al., 2021).

In recent years, there has been a noticeable increase in the emphasis placed on university acceptance by Iranian families. The increase in the number of students taking the national entrance exam has led to a significant increase in the stress levels of exam participants. Due to the potential negative impact of anxiety, such as diminished quality of life, tension, difficulty concentrating, and physical discomfort, the field of psychology has not adequately addressed the issue. Consequently, there is a need for research into methods to alleviate exam anxiety in this particular group of students. Due to the limited research available, this study intends to investigate the impact of defense mechanisms and coping strategies on the anxiety levels of adolescent girls with generalized anxiety disorder

E-ISSN: 2980-9681

during entrance exams. Additionally, the study will explore the role of resilience as a mediator in this process. The research aims to determine the impact that defense mechanisms and coping skills have on anxiety levels in adolescent girls, with resilience acting as a mediator.

2. Methods and Materials

2.1. Study Design and Participants

This study utilized a descriptive-correlational research approach along with the cross-sectional research method and employed structural equation modeling (SEM) and mediating variable analysis. The statistical population for this study consisted of adolescent girls with generalized anxiety disorder (GAD) at the pre-university level in Tehran from May to November 2024. Psychologists specializing in counseling clinics confirmed the presence of GAD in these girls, and approval was obtained from the school authorities. A total of 141 adolescent girls were selected for the study using purposive sampling. Using Cohen's formula (Cohen, 2013), considering elements like the quantity of observed and latent variables in the model, the anticipated effect size, and the desired probability and statistical power level. An anticipated effect size of 0.3, desired statistical power level of 0.8, 3 latent variables, 122 observed variables, and a probability level of 0.01 were factors considered in calculating a sample size of 137 participants. To account for potential attrition in the sample, the researcher increased the final sample size to 150 individuals.

The eligibility criteria for the study included individuals who visited psychological clinics and had consultation records related to generalized anxiety disorder (GAD), were preparing to take the national entrance exam (both first and second rounds), adolescents who provided informed consent to participate in the study, and parents who consented for their adolescents to take part in the research. Participants also needed to have a good understanding of the research they would be involved in. Individuals were ineligible to participate in the study if they were above 19 years old, were studying in fields other than mathematical, experimental sciences, and humanities (such as art disciplines), studied for less than 1 hour a day for the entrance exam (as this suggested they were not taking the exam seriously), had any physical condition that hindered their ability to respond, left more than ten questions unanswered in the questionnaires, or voluntarily withdrew from the study.

The study began by obtaining the necessary permits from the researcher's university. Subsequently, the researcher visited 12 psychological and counseling clinics in Tehran, selected based on specific criteria, in areas 1, 3, 5, and 4 of the city. Five clinics declined to participate, so they were excluded. Once the clinics were contacted and organized, families with children who had previously been diagnosed with GAD and had counseling records at these clinics were reached out to and asked to take part in the research project.

In the next phase, families received more comprehensive information about the study through social media channels. This information included the research objectives, permits, and guidelines about adherence to ethical principles. Due to a lack of support from parents, the research and collection of online questionnaires lasted for five months and involved 91 participants. Since there was a lack of collaboration and the sample size was not enough, the researcher opted to go to three high schools for girls in the city after discussing with professors from the university. With the assistance of the educational counselor at the schools, girls displaying severe anxiety were identified and selected based on specific criteria for participation in the study. The research conducted in schools lasted for two months and used 141 out of the 150 questionnaires that were distributed initially. Nine questionnaires were eliminated from the study because they contained incomplete or intentionally inaccurate responses. While online questionnaires were self-administered in clinics, they were conducted face-to-face in schools. Families and girls were assured of confidentiality in the research forms, with the option for adolescents to withdraw from the process if desired, in line with ethical standards. The study encompassed the assessment of defense mechanisms, coping skills, entrance exam anxiety, and resilience in all adolescent participants.

2.2. Measures

2.2.1. Coping Strategies

Billings and Moss developed the CSQ in 1981 to evaluate how individuals cope with challenges (Billings & Moos, 1984). It consists of 32 questions and includes five types of coping strategies: problem-solving (3 items), emotional restraint (11 items), cognitive assessment (5 items), physical restraint (9 items), and attracting social support (4 items). Each question is evaluated using a four-point Likert scale that ranges from never to always. A study in Iran reported a retest reliability coefficient of 0.79 for the questionnaire (Soltani et al., 2013). The Cronbach's alpha coefficients for the different components of the scale were 0.884 for Problem-Solving, 0.930 for Emotional Restraint, 0.860 for

E-ISSN: 2980-9681

Cognitive Assessment, 0.735 for Physical Restraint, and 0.885 for Attracting Social Support. The Composite Reliability coefficients were 0.910, 0.944, 0.895, 0.834, and 0.905 respectively. The AVE for convergent validity was 0.592, 0.707, 0.588, 0.558, and 0.75 respectively.

2.2.2. Resilience

Researchers have confirmed the validity and reliability of the resilience questionnaire developed by Connor & Davidson in 2003, which aims to evaluate resilience in individuals (Connor & Davidson, 2003). Consisting of 25 items, each rated on a five-point Likert scale from zero (completely false) to four (always true), the questionnaire calculates a total score based on the person's responses. Scores range from 0 to 100, with higher scores indicating greater resilience. In Iran, the scale has demonstrated a reliability of 0.77 using the Cronbach's alpha test (Nemati et al., 2019). In this study, the Cronbach's alpha for the questionnaire was 0.701, and the Composite Reliability value was 0.732. "Moreover, the AVE value was computed as 0.51 to assess convergent validity."

2.2.3. Defense Style

Andrews and colleagues (1993) developed a survey to evaluate individuals' defensive techniques, and the researcher has verified its validity and reliability (Andrews et al., 1993). The questionnaire consists of 20 defense mechanisms categorized into three components: mature (questions 4, 6, 8, 9, 10, 11, 12, 14, 19, 2, 3, 31, 34, 16, 29, 18, 15, 13, 20, 27, 17, 22, 36, 33, 37), immature (questions 25, 26, 35, 38, 2, 3, 5), and neurotic (questions 1, 7, 21, 24, 28, 32, 39, 40), mature mechanisms such as suppression, anticipated, sublimation, and humor. immature defense mechanisms include rationalization, projection, denial, and others. Additionally, the defense mechanisms of the offended neurotic include false friendship, reactive formation, rationalization, and denial. The DSQ questionnaire comprises 40 questions scored on a nine-point Likert scale ranging from 1 (completely disagree) to 9 (completely agree). The individual's scores on the different subscales are combined to determine their overall score. A higher score suggests a more robust defensive style in the individual. In Iran, the reliability of this scale was assessed using Cronbach's alpha test, with values ranging between 0.83 and 0.94 for the mature style component, between 0.81 and 0.92 for the immature component, and between 0.79 and 0.91 for the neurotic component. Moreover, the retest reliability was also examined within a 2 to 6-week interval, resulting in values between 0.73 and 0.87 for the mature component, 0.71 and 0.84 for the immature component, and 0.69 and 0.78 for the neurotic component (Bita & Jafariharandi, 2018). In this study, the Cronbach's alpha values for the immature defensive style, mature defensive style, and neurotic defensive style components were 0.894, 0.782, and 0.802, while the corresponding Composite Reliability values were 0.912, 0.872, and 0.843. The corresponding Composite Reliability values were 0.912, 0.872, and 0.843. Similarly, the AVE values for convergent validity were 0.60, 0.69, and 0.54, respectively.

2.2.4. Exam Anxiety

Sarason (1997) created a questionnaire to measure levels of test anxiety in social humiliation, cognitive error, and tension dimensions, which has been validated and proven reliable (Sarason, 1984). The questionnaire includes 25 items, each rated on a four-point scale from never (0) to most of the time (3). Total scores are determined by adding up scores for individual items, ranging from 0 to 75. Higher scores indicate higher levels of test anxiety, with less than 12 indicating no anxiety, 13 to 37 indicating moderate anxiety, and above 63 indicating high anxiety. The questionnaire had a reliability coefficient of 0.84 in Iran and a criterion validity coefficient of 0.72. For the current study, Cronbach's alpha was 0.811, Composite Reliability was 0.869, and the AVE value for convergent validity was 0.571.

2.3. Data Analysis

The data was ultimately analyzed using SPSS version 27 and Smart PLS 4 software, utilizing the structural equation model technique. The statistical results were deemed noteworthy at the 0.05 threshold. The author utilized SPSS software to evaluate the descriptive statistics in this study. The writer employed the structural equation model approach to assess the path coefficients and intermediary variables. Additionally, bootstrapping was employed to verify the model's significance. The significance of the mediating variables was determined using the Sobel test.

3. Findings and Results

At first, the researcher analyzed the descriptive statistics connected to the study's variables. Female students were grouped into three categories depending on their field of study: Mathematics (58.9%), Experimental (25.5%), and

E-ISSN: 2980-9681

Humanities (15.6%). Similarly, based on the amount of reading per day, they were divided into three groups: 1 to 3 hours per day (31.2%), 3 to 6 hours (29.1%), and more than 6 hours per day (39.7%).

Table 1

Description of the demographic variables

Variables	Groups	F	%	Sample size	Median
Field of Study	Mathematics field	83	58.9	141	1
	Experimental field	36	25.5		
	Humanities field	22	15.6		
The amount of reading per day	1-3 hours	44	31.2	141	2
	3-6 hours	41	29.1		
	+6 hours	56	39.7		

Table 2 shows the mean and standard deviation of the research variables.

Table 2

Description of the main research variables

Variables	N	Mean	SD	Min	Max	Skewness	Kurtosis	Shapiro-Wilk	
								W	p
Problem-Solving	141	5.028	2.181	1	8	-0.334	-0.911	0.925	< .001
Emotional restraint	141	12.766	10.125	1	26	0.132	-1.847	0.783	< .001
Cognitive assessment	141	6.858	3.432	1	14	-0.095	-1.219	0.920	< .001
Physical restraint	141	13.972	2.342	11	18	0.021	-1.102	0.867	< .001
Attracting social support	141	6.936	3.725	1	11	-0.337	-1.524	0.830	< .001
Immature defensive style	141	146.128	11.592	131	177	1.027	0.126	0.876	< .001
Mature defensive style	141	30.099	6.233	20	48	0.502	0.051	0.959	< .001
Neurotic defensive style	141	36.489	4.732	28	43	-0.160	-1.501	0.888	< .001
Resilience	141	54.560	5.831	43	67	0.296	-0.618	0.969	0.003
Exam Anxiety	141	43.759	5.731	30	53	-0.352	-0.530	0.964	< .001

Table 3 displays the relationship between research variables using Pearson's correlation coefficient. The researcher evaluated the test assumptions by using the Shapiro-Wilk test to check for the normal distribution of the research variables. The test results showed that the research variables do not have a normal distribution, indicating the need to use SmartPLS software for conducting the structural equation model. The researcher utilized a random sampling method, meeting the assumption of randomness. The sample size of 141 individuals is deemed adequate for running the structural equation model with the partial least squares method.

Table 3

Pearson's correlation coefficient

Variable	1	2	3	4	5	6	7	8	9	10
Exam Anxiety	—									
Problem-Solving	-0.706	—								
Emotional restraint	-0.721	0.627	—							
Cognitive assessment	-0.744	0.648	0.827	—						
Physical restraint	-0.436	0.462	0.334	0.354	—					
Attracting social support	-0.699	0.629	0.649	0.801	0.386	—				
Immature defensive style	0.677	-0.515	-0.472	-0.550	-0.282	-0.488	—			
Mature defensive style	-0.707	0.626	0.539	0.671	0.525	0.625	-0.570	—		
Neurotic defensive style	0.456	-0.382	-0.450	-0.474	-0.224	-0.437	0.405	-0.475	—	
Resilience	-0.725	0.564	0.497	0.595	0.371	0.559	-0.544	0.531	-0.407	—

E-ISSN: 2980-9681

According to the information provided in Table 3, several coping skills variables such as problem-solving, Emotional restraint, Cognitive assessment, Physical restraint, and Attracting social support showed a significant negative correlation with Exam Anxiety. Additionally, the variables related to defense mechanisms, including Mature defensive style, were also found to have a significant negative association with Exam Anxiety. On the other hand, the Immature defensive style and the Neurotic defensive style exhibited a positive relationship with Exam Anxiety. Furthermore, Resilience was identified to have a negative correlation with Exam Anxiety. The researcher then moved on to examine the path coefficients and p-value between the variables in the study, as shown in Table 4. To ensure the reliability of the results, the researcher established a bootstrap value of 5000 for this study.

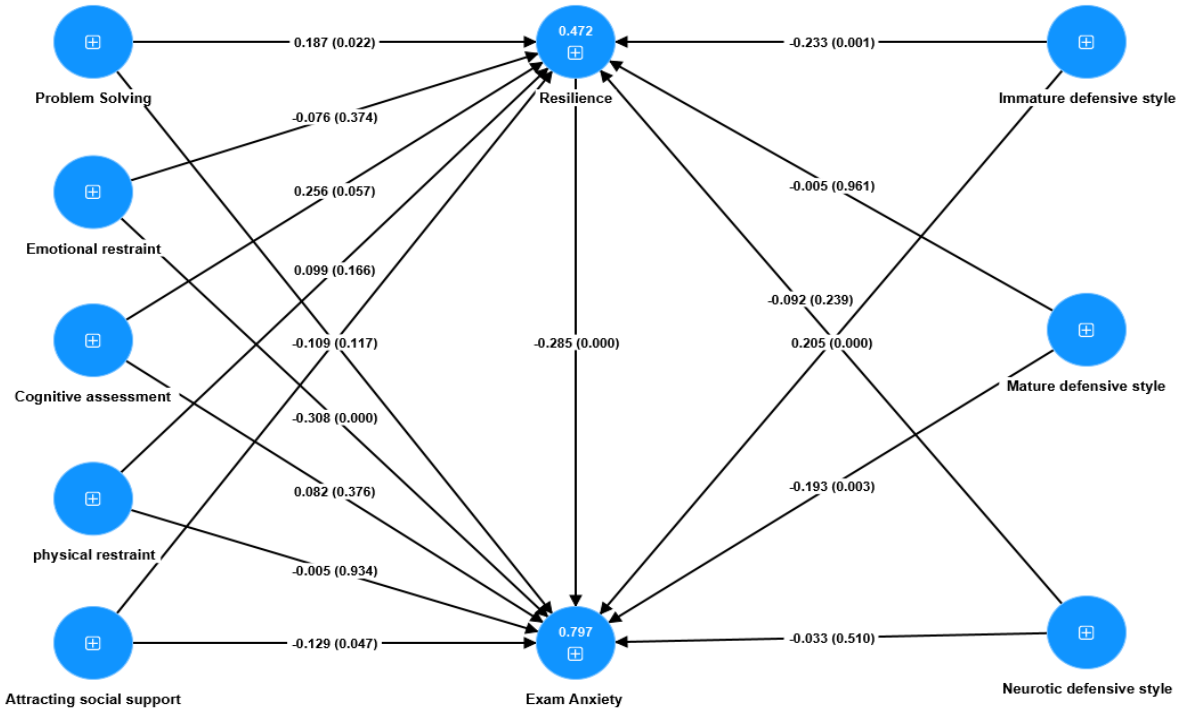
Table 4

Standard research coefficients in general

Path between variables	Path	STDEV	P-value	T-value	Result
Attracting social support -> Anxiety	-0.129	0.065	0.047	1.985	confirmation
Attracting social support -> Resilience	0.097	0.086	0.259	1.128	rejection
Cognitive assessment -> Anxiety	0.082	0.093	0.376	0.885	rejection
Cognitive assessment -> Resilience	0.256	0.134	0.057	1.906	rejection
Mature defensive style -> Anxiety	-0.193	0.066	0.003	2.934	confirmation
Mature defensive style -> Resilience	-0.005	0.113	0.961	0.048	rejection
Emotional restraint -> Anxiety	-0.308	0.075	0.000	4.094	confirmation
Emotional restraint -> Resilience	-0.076	0.085	0.374	0.889	rejection
Neurotic defensive style -> Anxiety	-0.033	0.050	0.510	0.658	rejection
Neurotic defensive style -> Resilience	-0.092	0.078	0.239	1.178	rejection
Problem-Solving -> Anxiety	-0.109	0.069	0.117	1.569	rejection
Problem-Solving -> Resilience	0.187	0.082	0.022	2.286	confirmation
Resilience -> Anxiety	-0.285	0.054	0.000	5.239	confirmation
Immature defensive style -> Anxiety	0.205	0.042	0.000	4.864	confirmation
Immature defensive style -> Resilience	-0.233	0.071	0.001	3.309	confirmation
physical restraint -> Anxiety	-0.005	0.060	0.934	0.083	rejection
physical restraint -> Resilience	0.099	0.071	0.166	1.384	rejection

Figure 1

Path coefficients between variables and P-value



E-ISSN: 2980-9681

According to the findings presented in Table 4, the Problem-Solving aspect of coping skills had a positive and significant influence on Resilience (β = 0.187, p = 0.022) but did not have a direct significant impact on Anxiety (β = -0.109, p = 0.117). The Emotional restraint feature did not show a significant effect on Resilience (β = -0.076, p = 0.374), it had a negative and significant influence on Anxiety (β = -0.308, p = 0.000). Cognitive assessment and the physical restraint did not show a notable impact on the factors under investigation. While the Attracting social support component did not have a significant effect on Resilience (β = 0.097, p = 0.259), it did have a direct negative and significant impact on Anxiety (β = -0.129, p = 0.047).

Similarly, the defense mechanisms variables, particularly the mature defensive style component, did not show a significant impact on Resilience (β=-0.005, p=0.961) but did have a negative and significant effect on Anxiety (β=-0.193, p=0.003) in a direct manner. On the other hand, the Immature defensive style component had a negative and notable influence on Resilience (β=-0.233, p=0.001) while having a positive and significant impact on Anxiety (β=0.205, p=0.000) directly. The Neurotic defensive style component did not have a noteworthy effect on Resilience or Anxiety. Resilience also had a negative and significant direct influence on Anxiety (β=-0.285, p=0.000). The researcher then utilized the bootstrap method to explore the indirect effects of the study variables.

Table 5

Total Indirect effects between research variables

Path between variables	Path coefficient	SD	P-value	T-value	Result
Physical restraint -> Resilience -> Exam Anxiety	-0.028	0.024	0.231	1.199	rejection
Emotional restraint -> Resilience -> Exam Anxiety	0.022	0.024	0.368	0.899	rejection
Mature defensive style -> Resilience -> Exam Anxiety	0.002	0.032	0.961	0.049	rejection
Cognitive assessment -> Resilience -> Exam Anxiety	-0.073	0.041	0.074	1.786	rejection
Neurotic defensive style -> Resilience -> Exam Anxiety	0.026	0.023	0.261	1.124	rejection
Problem-Solving -> Resilience -> Exam Anxiety	-0.053	0.026	0.040	2.058	confirmation
Attracting social support -> Resilience -> Exam Anxiety	-0.028	0.025	0.274	1.093	rejection
Immature defensive style -> Resilience -> Exam Anxiety	0.067	0.026	0.010	2.570	confirmation

According to the results shown in Table 5, it was noted that Problem Solving via Resilience had a notable adverse effect on Exam Anxiety (β=-0.053, P=0.040). Likewise, an immature defensive style was connected to Exam Anxiety through Resilience in a positive and significant manner (β=-0.067, P=0.010). The results suggest that individuals may reduce the impact of an immature defensive style on exam anxiety by enhancing their resilience. Furthermore, the researcher utilized the Sobel test to assess the significance of the mediating variables in the study, with calculations performed using a specific formula.

$$\text{Z value} = \frac{|a \times b|}{\sqrt{(b^2 \times S_a^2) + (a^2 \times S_b^2) + (S_a^2 \times S_b^2)}}$$

a: The value of the path coefficient between the independent variable and the mediator

b: Path coefficient value between mediating and dependent variable

Sa: The standard error of the path between the independent variable and the mediator

Sb: Standard error of the path between the mediator and dependent variable

In the Sobel test, a Z value greater than 1.96 indicates a significant mediating effect at a 95% P-value. The Z value for Resilience mediating between Problem-Solving and Exam Anxiety was -2.0934. The Z value for Resilience mediating between immature defensive style and Exam Anxiety was 2.78687. Based on the Sobel test results, it can be determined that the mediating variable in the study is significant. The researcher also looked at the coefficient of determination for endogenous variables in the study.

E-ISSN: 2980-9681

Table 6

Coefficient of determination

Variables	R-square	Adjusted R-squared
Anxiety stress	0.797	0.783
Resilience	0.472	0.440

The researcher examined the reliability and validity of the research model presented in Table 7.

Table 7

Reliability and validity of the model

Variables	Cronbach's Alpha	Composite Reliability	AVE
Anxiety	0.811	0.869	0.571
Problem-Solving	0.884	0.910	0.592
Emotional restraint	0.930	0.944	0.707
Cognitive assessment	0.860	0.895	0.588
Physical restraint	0.735	0.834	0.558
Attracting social support	0.885	0.905	0.75
Immature defensive style	0.894	0.912	0.60
Mature defensive style	0.782	0.872	0.69
Neurotic defensive style	0.802	0.843	0.54
Resilience	0.701	0.732	0.51

Table 7 showcases the confirmation of the model's reliability and validity. The Cronbach's alpha reliability for the variables exceeds 0.7. Furthermore, the combined reliability of these variables also exceeds 0.7. The validity of the model was determined by analyzing the average variance extracted index, which showed values of more than 0.5 for all research variables, thus confirming the model's validity. Furthermore, the researcher assessed the model's overall fit by confirming all fit indices. The SRMR value for the model was 0.069, indicating a good fit. Blindfolding was utilized to assess the model's predictive ability, with Q2 values above zero indicating a well-reconstructed model with predictive capability. Table 8 also confirms the model's fit.

Table 8

Predictive Q^2

Variable	SSO	SSE	Q^2 (=1-SSE/SSO)
Anxiety	141.000	33.331	0.764
Attracting social support	141.000	141.000	-
Cognitive assessment	141.000	141.000	-
Mature defensive style	141.000	141.000	-
Emotional restraint	141.000	141.000	-
Neurotic defensive style	141.000	141.000	-
Problem-Solving	141.000	141.000	-
Resilience	141.000	80.053	0.432
Immature defensive style	141.000	141.000	-
physical restraint	141.000	141.000	-

4. Discussion and Conclusion

The current study aimed to explore how defense mechanisms and coping skills impact entrance exam anxiety in adolescent girls with generalized anxiety disorder (GAD) while considering the mediating role of resilience. The findings revealed that problem-solving coping skills boosted resilience, while emotional restraint and attracting social

E-ISSN: 2980-9681

support decreased anxiety. Additionally, a mature defensive style reduced anxiety, while an immature defensive style lowered resilience and increased anxiety. Furthermore, the resilience factor also reduced anxiety levels and played a crucial role as a mediating variable in the study.

The results of the present study, which demonstrated that problem-solving skills can enhance resilience and that emotional restraint and attracting social support can decrease anxiety, are consistent with prior research (Buffart et al., 2020; Jozan et al., 2023; Nwaogu & Chan, 2022). Previous research has suggested that coping mechanisms play a role in improving students' resilience (Jozan et al., 2023). Similarly, a study found that individual resilience and attracting social support as coping strategies were associated with lower anxiety levels (Nwaogu & Chan, 2022). Buffart et al. (2020) also found that coping skills are effective in reducing symptoms of anxiety (Buffart et al., 2020).

Resilience is described as an iterative process in which people face amenity or psychological hardships and demonstrate constructive coping strategies. Coping skills play a role in employing effective coping strategies. The availability of resources for resilience determines whether stressful factors can disrupt the biological-psychological equilibrium of students. Positive inputs such as support, healthy activities, and guidance, as well as negative inputs like stress, time demands, and energy, either enhance or deplete an individual's coping reservoir, which encompasses personality traits, temperament, and coping style, leading to heightened resilience among students (Fullerton et al., 2021). Adolescents can utilize various cognitive, emotional, or behavioral response strategies, known as coping styles when encountering challenging or stressful life situations such as exams. Students with positive coping skills typically display stronger resilience and emotional expression, indicating good psychological adjustment and reduced anxiety. Coping styles could also impact anxiety through normal or pathological changes at the biological level in individuals Furthermore, when students have adequate social support, they are more likely to utilize beneficial coping mechanisms, leading to reduced anxiety levels (Zhu et al., 2020).

The study also revealed that the mature defensive style element can lower anxiety levels, while the immature defensive style component can lead to decreased resilience and increased anxiety, aligning with previous research (Di Giuseppe et al., 2019; Di Giuseppe et al., 2021; Ferrajão et al., 2022; Walker & McCabe, 2021). According to Di Giuseppe et al. (2021), individuals with an immature defensive style tend to experience more distress and lower resilience (Di Giuseppe et al., 2021). Previous research has highlighted the significant role defense mechanisms play in shielding individuals from psychological distress and symptom development (Walker & McCabe, 2021). Additionally, a study indicated that heightened levels of immature defense mechanisms could worsen symptoms of anxiety and depression (Ferrajão et al., 2022).

It should be noted that students facing challenging situations may utilize unconscious defense mechanisms in addition to coping skills to manage reactions to traumatic experiences and protect themselves from being fully aware of their emotions, internal conflicts, and external stresses. The maturity of defense mechanisms plays a role in safeguarding against mental and physical illnesses, with mature defenses helping to decrease negative emotions, increase awareness of stressors, and facilitate the resolution of conflicts, ultimately leading to a reduction in anxiety (Di Giuseppe et al., 2021). While individuals may employ various defense mechanisms throughout their lives, healthy individuals typically rely on mature defenses to address internal and external stressors. However, exposure to traumatic events may prompt a shift towards immature defenses, where individuals use avoidance, denial, displacement, regression, and detachment as responses to psychological challenges. Immature defense mechanisms could contribute to emotional exhaustion, heightened stress, anxiety, and diminished resilience (Di Giuseppe et al., 2019).

Additionally, the research discovered that resilience plays a role in decreasing anxiety and is meaningful as a mediator, consistent with earlier studies (Devi et al., 2021; Liu et al., 2021; Nwaogu & Chan, 2022). Previous research has also shown a strong connection between coping mechanisms and anxiety in individuals with high levels of resilience (Nwaogu & Chan, 2022). Another study confirmed that resilience has an impact on students' anxiety levels (Devi et al., 2021). Additionally, research has shown that psychological resilience plays a mediator role in the relationship between emotion regulation and test anxiety (Liu et al., 2021).

Explaining this discovery involves mentioning that psychological resilience is the capacity, outcome, or iterative process of effectively adjusting to challenges, trauma, or other sources of stress, acting as a mediator between stress and mental well-being. For students with resilience, higher resilience may decrease the negative impacts of stress and anxiety. Hence, resilience serves as a crucial protective

E-ISSN: 2980-9681

factor against stress or traumatic experiences and can shield against psychological distress (Ran et al., 2020). Students with strong resilience tackle anxiety-inducing situations with optimism, self-assurance, and assertiveness, enabling them to perceive events as manageable. This positive outlook leads to improved information processing and the use of effective coping strategies, enhancing the ability to deal with difficult circumstances. Moreover, resilience enhances individuals' adaptability by increasing flexibility, promoting mental health, and diminishing anxiety levels by reducing negative emotions (Haghi, 2018).

This research study also encountered limitations. One such limitation was that it focused solely on female adolescents. Future research should investigate the influence of gender on the utilization of defense mechanisms among female students, considering the impossibility of controlling gender. The research included individuals preparing for entrance exams, resulting in challenges such as conflicting emotions, limited time, and issues with coordinating questionnaire completion. Similar to previous studies, this research relied on self-report methods for data collection. While self-report measures offer valuable insights, they are subject to biases such as social desirability and recall bias. Combining self-report measures with observations or interviews can help mitigate response bias. Although the sample size in this study was deemed adequate, a more diverse group of participants in terms of age, cultural background, and education level is necessary for generalizing the findings. It is important to note that due to restrictions set by teachers, students may have rushed through the questionnaire, potentially compromising the accuracy of the results. Extra caution should be taken when applying the research findings from Iran to countries with varying cultural and educational backgrounds.

The results of this study demonstrated the significance of resilience, defensive mechanisms, and coping skills in the test anxiety experienced by female students. Strengthened coping skills mature defensive style, and resilience can be beneficial in assisting students dealing with exam anxiety, with psychological resilience being a critical focus for interventions targeting mental health improvement. As educational institutions play a crucial role in identifying and preventing mental health issues early on, the promotion of resilience and coping skills aligns with this objective. It is suggested that schools provide students with educational videos and brochures about anxiety management techniques to help improve their well-being and address the effects of anxiety.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We hereby thank all individuals for participating and cooperating us in this study.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

References

Alghadir, A., Manzar, M. D., Anwer, S., Albougami, A., & Salahuddin, M. (2020). Psychometric properties of the generalized anxiety disorder scale among Saudi University male students. *Neuropsychiatric Disease and Treatment*, *16*, 1427-1432. https://doi.org/10.2147/NDT.S246526

Andrews, G., Singh, M., & Bond, M. (1993). Defense Style Questionnaire–40 (DSQ-40). *Journal of Nervous and Mental Disease*. https://doi.org/10.1037/t20765-000

Azimifar, A., & Zahmatkesh, Z. (2021). The relationship between self-hypnosis and five major personality factors with anxiety in Iranian entrance exam candidates. *Islamic Lifestyle Centered on Health*, *4*, 167-176. https://www.sid.ir/paper/413520/fa#downloadbottom

Billings, A. G., & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. *Journal of personality and social psychology*, *46*(4), 877. https://doi.org/10.1037/0022-3514.46.4.877

Bita, M., & Jafariharandi, R. (2018). Predicting life satisfaction in terms of personality traits and defense mechanisms. *Women's*

E-ISSN: 2980-9681

Studies Sociological and Psychological, *16*(1), 111-150. https://doi.org/10.22051/jwsps.2018.20570.1752

Buffart, L. M., Schreurs, M. A., Abrahams, H. J., Kalter, J., Aaronson, N. K., Jacobsen, P. B., Newton, R. U., Courneya, K. S., Armes, J., Arving, C., & Braamse, A. M. (2020). Effects and moderators of coping skills training on symptoms of depression and anxiety in patients with cancer: Aggregate data and individual patient data meta-analyses. *Clinical psychology review*, *80*, 101882. https://doi.org/10.1016/j.cpr.2020.101882

Byrd-Bredbenner, C., Eck, K., & Quick, V. (2020). Psychometric properties of the generalized anxiety disorder-7 and generalized anxiety disorder-mini in United States university students. *Frontiers in psychology*, *11*, 550533. https://doi.org/10.3389/fpsyg.2020.550533

Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Academic Press. https://www.taylorfrancis.com/books/mono/10.4324/9780203771587/statistical-power-analysis-behavioral-sciences-jacob-cohen

Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety*, *18*(2), 76-82. https://doi.org/10.1002/da.10113

Darbani, S. A., & Parsakia, K. (2023). Investigating the effectiveness of strength-based counseling on adolescent resilience. *Journal of Adolescent and Youth Psychological Studies (JAYPS)*, *4*(5), 169-175. https://doi.org/10.61838/kman.jayps.4.5.16

Devi, H. M., Purborini, N., & Chang, H. J. (2021). Mediating effect of resilience on association among stress, depression, and anxiety in Indonesian nursing students. *Journal of Professional Nursing*, *37*(4), 706-713. https://doi.org/10.1016/j.profnurs.2021.04.004

Di Giuseppe, M., Ciacchini, R., Piarulli, A., Nepa, G., & Conversano, C. (2019). Mindfulness dispositions and defense style as positive responses to psychological distress in oncology professionals. *European Journal of Oncology Nursing*, *40*, 104-110. https://doi.org/10.1016/j.ejon.2019.04.003

Di Giuseppe, M., Nepa, G., Prout, T. A., Albertini, F., Marcelli, S., Orrù, G., & Conversano, C. (2021). Stress, burnout, and resilience among healthcare workers during the COVID-19 emergency: The role of defense mechanisms. *International journal of environmental research and public health*, *18*(10), 5258. https://doi.org/10.3390/ijerph18105258

Ferrajão, P., Dias, J., & Elklit, A. (2022). Defense mechanisms mediate associations between exposure to adverse childhood experiences and anxiety and depression in Kenyan adolescents. *Traumatology*. https://doi.org/10.1037/trm0000426

Fullerton, D. J., Zhang, L. M., & Kleitman, S. (2021). An integrative process model of resilience in an academic context: Resilience resources, coping strategies, and positive adaptation. *PLoS One*, *16*(2), e0246000. https://doi.org/10.1371/journal.pone.0246000

Golparvar, M., & Parsakia, K. (2023). Building Resilience: Psychological Approaches to Prevent Burnout in Health Professionals. *KMAN Counseling & Psychology Nexus*, *1*(1), 159-166. https://doi.org/10.61838/kman.psychnexus.1.1.18

Haghi, S. (2018). The effect of resilience training on anxiety of patients with deformity due to burning injuries. *Journal of Health and Care*, *20*(3), 196-206. https://doi.org/10.29252/jhc.20.3.196

Hinds, J. A., & Sanchez, E. R. (2022). The role of the hypothalamus–pituitary–adrenal (HPA) axis in test-induced anxiety: Assessments, physiological responses, and molecular details. *Stresses*, *2*(1), 146-155. https://doi.org/10.3390/stresses2010011

Jozan, A., Fardin, M. A., & Sanagooe Moharer, G. (2023). The effectiveness of coping skills training on resilience of students who have recovered from COVID-19. *Sociology of Education*, *9*(2), 285-294. https://doi.org/10.22034/ijes.2023.1988012.1382

Liu, Y., Pan, H., Yang, R., Wang, X., Rao, J., Zhang, X., & Pan, C. (2021). The relationship between test anxiety and emotion regulation: The mediating effect of psychological resilience. *Annals of General Psychiatry*, *20*, 1-9. https://doi.org/10.1186/s12991-021-00360-4

Motallebi, M., Pour, M. S., Mehrnia, N., Behnaz, M., & Nia, N. M. (2023). Investigating the relationship between stress and oral health-related behaviors changes in final year of high school students prior to university entrance exam. https://www.sid.ir/paper/1116708/fa#downloadbottom

Nemati, S., Imanzadeh, A., Fouruhi, N., Mahdavi, M., & Afshin, H. (2019). The relationship between religious coping strategy, resiliency, and marital satisfaction. *Journal of Modern Psychological Researches*, *14*(53), 317-331. https://doi.org/20.1001.1.27173852.1398.14.53.15.8

Nwaogu, J. M., & Chan, A. P. (2022). The impact of coping strategies and individual resilience on anxiety and depression among construction supervisors. *Buildings*, *12*(12), 2148. https://doi.org/10.3390/buildings12122148

Pour, H., & Mansouri, A. (2021). The mediating role of worry and rumination in the relationship between behavioral brain systems and generalized anxiety disorder in students. *Clinical Psychology and Personality*, *19*(1), 121-130. https://doi.org/10.22070/cpap.2020.3047

Prekazi, L., Hajrullahu, V., Bahtiri, S., Kryeziu, B., Hyseni, B., Taganoviq, B., & Gallopeni, F. (2021). The impact of coping skills in post-traumatic growth of healthcare providers: When mental health is deteriorating due to the COVID-19 pandemic. *Frontiers in psychology*, *12*, 791568. https://doi.org/10.3389/fpsyg.2021.791568

Ran, L., Wang, W., Ai, M., Kong, Y., Chen, J., & Kuang, L. (2020). Psychological resilience, depression, anxiety, and somatization symptoms in response to COVID-19: A study of the general population in China at the peak of its epidemic. *Social Science & Medicine*, *262*, 113261. https://doi.org/10.1016/j.socscimed.2020.113261

Sarason, I. G. (1984). Stress, anxiety, and cognitive interference: Reactions to tests. *Journal of personality and social psychology*, *46*(4), 929. https://doi.org/10.1037/0022-3514.46.4.929

Soltani, E., Shareh, H., Bahrainian, S. A., & Farmani, A. (2013). The mediating role of cognitive flexibility in correlation of coping styles and resilience with depression. *Pajoohandeh Journal*, *18*(2), 88-96. http://pajoohande.sbmu.ac.ir/article-1-1518-fa.html

Sun, J., Liang, K., Chi, X., & Chen, S. (2021). Psychometric properties of the generalized anxiety disorder scale-7 item (GAD-7) in a large sample of Chinese adolescents. *Healthcare*, *9*(12), 1709. https://doi.org/10.3390/healthcare9121709

Tabe Bordbar, F., & Kaveh, M. (2021). Investigating the relationship between various defense mechanisms and coronavirus anxiety. *Armaghane Danesh*, *25*, 921-936. https://doi.org/10.52547/armaghanj.25.S1.921

Trindade, S. C., Sousa, L. F., & Carreira, L. B. (2021). Generalized anxiety disorder and prevalence of suicide risk among medical students. *Revista Brasileira de Educação Médica*, *45*(2), e061. https://doi.org/10.1590/1981-5271v45.2-20200043.ING

E-ISSN: 2980-9681

Vaillant, G. E. (2020). Defense mechanisms. In *Encyclopedia of Personality and Individual Differences* (pp. 1024-1033). https://doi.org/10.1007/978-3-319-24612-3_1372

Walker, G., & McCabe, T. (2021). Psychological defense mechanisms during the COVID-19 pandemic: A case series. *The European Journal of Psychiatry*, *35*(1), 41-45. https://doi.org/10.1016/j.ejpsy.2020.10.005

Zhu, W., Wei, Y., Meng, X., & Li, J. (2020). The mediation effects of coping style on the relationship between social support and anxiety in Chinese medical staff during COVID-19. *BMC Health Services Research*, *20*, 1-7. https://doi.org/10.1186/s12913-020-05871-6

E-ISSN: 2980-9681