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The Relationship Between Anxiety and Self-Efficacy Mediated by Cognitive Flexibility in Female University Students

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A B S T R A C T

The present study aimed to investigate the relationship between anxiety and self-efficacy with the mediating role of cognitive flexibility among female university students. This research was a fundamental and descriptive study using a path analysis method within a correlational design. The statistical population included all female students at the Islamic Azad University, Garmsar Branch, in 2024. Using purposive and convenience sampling, 295 valid questionnaires were collected. Data were gathered using the Sherer General Self-Efficacy Scale, the Beck Anxiety Inventory, and the Cognitive Flexibility Inventory by Dennis and Vander Wal. To analyze the data, Pearson correlation coefficients and multiple regression analyses within a structural equation modeling framework were conducted using SPSS version 25 and AMOS, with a significance level set at $p < .05$. Pearson correlation results showed that anxiety had a significant negative correlation with both self-efficacy ($r = -0.52$, $p < .001$) and cognitive flexibility ($r = -0.46$, $p < .001$), while cognitive flexibility had a significant positive correlation with self-efficacy ($r = 0.59$, $p < .001$). The structural model revealed that anxiety significantly and negatively predicted self-efficacy ($\beta = -0.38$, $p < .001$) and cognitive flexibility ($\beta = -0.36$, $p < .001$), whereas cognitive flexibility significantly and positively predicted self-efficacy ($\beta = 0.47$, $p < .001$). The indirect effect of anxiety on self-efficacy through cognitive flexibility was also significant ($\beta = -0.17$, $p < .001$), confirming the mediating role of cognitive flexibility. Model fit indices indicated a good fit ($\chi^2/df = 1.96$, GFI = 0.93, CFI = 0.96, RMSEA = 0.047). The findings highlight the critical role of cognitive flexibility in mitigating the negative impact of anxiety on self-efficacy. Enhancing cognitive flexibility in academic and clinical settings may serve as a valuable strategy to improve self-efficacy and reduce anxiety among female students.

Keywords: *Anxiety, Self-Efficacy, Cognitive Flexibility, Female University Students.*

1. Introduction

In recent years, the psychological well-being of university students has become an increasingly important area of study due to the multidimensional stressors they encounter during academic and personal development. Among the various psychological constructs associated with academic and emotional functioning, anxiety and self-efficacy stand out for their pervasive influence on students' cognitive, emotional, and behavioral regulation. Anxiety is often viewed as a disruptive emotional state that impairs concentration, motivation, and performance, especially in high-pressure environments like universities. Conversely,

self-efficacy is widely recognized as a protective psychological factor that enhances individuals' motivation and perseverance, enabling them to tackle challenges with greater confidence and resilience. The interplay between these two constructs has drawn significant scholarly interest, particularly when analyzed through mediating variables such as cognitive flexibility, which plays a crucial role in how individuals adapt to new information, shift perspectives, and regulate responses under stress.

Anxiety among university students is a global concern, impacting cognitive functioning, emotional regulation, and overall academic achievement. The chronic presence of anxiety can interfere with attentional processes and working memory, which are fundamental to learning and academic success (1). Additionally, elevated anxiety levels have been linked to impaired cognitive flexibility, defined as the ability to shift mental sets and adjust to changing task demands or environmental contingencies (2). Cognitive inflexibility, in turn, may contribute to maladaptive patterns of thinking such as rumination and experiential avoidance, both of which exacerbate emotional dysregulation and hinder effective coping mechanisms in anxious individuals (3, 4).

The concept of self-efficacy, introduced by Bandura, refers to an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments. This belief system not only affects the choices individuals make but also their level of effort, perseverance in the face of adversity, and resilience after setbacks. High self-efficacy is associated with enhanced problem-solving skills, emotional stability, and better stress management (5, 6). Research suggests that individuals with greater self-efficacy experience lower anxiety levels and are more likely to engage in goal-directed behavior even in the face of challenges (7, 8). In the academic context, self-efficacy has been consistently linked to improved motivation, self-regulation, and academic performance, while simultaneously serving as a buffer against test anxiety and academic stress (9, 10).

Cognitive flexibility serves as a crucial intermediary in the relationship between anxiety and self-efficacy. It facilitates the adaptive adjustment of thinking patterns in response to dynamic circumstances and contributes to the effective regulation of emotional responses. Cognitive flexibility enables individuals to reinterpret adverse situations, adopt alternative perspectives, and engage in constructive problem-solving, which collectively reduce the impact of anxiety and reinforce self-efficacy beliefs (11, 12). Empirical evidence supports the mediating role of cognitive flexibility in psychological outcomes. For instance, individuals with higher cognitive flexibility are less likely to catastrophize and more capable of emotion regulation, both of which mitigate anxiety and enhance self-perception of competence (13, 14).

The interplay between anxiety, self-efficacy, and cognitive flexibility has been examined in various psychological contexts. Studies have shown that anxiety impairs the executive functions necessary for flexible thinking, which in turn diminishes self-efficacy. Conversely, promoting cognitive flexibility through therapeutic interventions has led to measurable improvements in both anxiety reduction and self-efficacy enhancement (15, 16). Moreover, cultural factors may influence this dynamic, as collectivistic cultural norms have been associated with lower levels of perceived self-efficacy and cognitive flexibility due to increased social conformity and stress associated with academic failure (17). The complexity of these relationships underscores the importance of considering cognitive flexibility not merely as a cognitive trait but as a dynamic mediator with direct implications for intervention and support strategies among students.

Within the academic domain, anxiety and self-efficacy are often discussed in relation to learning outcomes and emotional resilience. Students with higher levels of self-efficacy are more likely to adopt mastery-oriented goals and demonstrate sustained effort, even when confronted with obstacles. Conversely, those with high anxiety often engage in avoidance behaviors, display low confidence in academic tasks, and are more prone to academic disengagement (18, 19). The presence of cognitive flexibility allows individuals to override these maladaptive tendencies by fostering the reinterpretation of threatening academic experiences and promoting alternative cognitive pathways that support academic success and psychological well-being (20, 21).

Despite the robust literature exploring the individual and combined effects of anxiety and self-efficacy on academic and emotional outcomes, limited attention has been paid to the mediating role of cognitive flexibility in this relationship, particularly among female university students—a group that

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may face unique sociocultural and psychological pressures in academic settings. Previous research has indicated that female students report higher levels of academic anxiety and lower levels of perceived self-efficacy compared to their male counterparts, often due to societal expectations, stereotype threat, and internalized performance standards (22, 23). Investigating the role of cognitive flexibility in this specific population may provide new insights into targeted interventions that address the unique challenges faced by female students in higher education.

In this regard, the current study aims to examine the relationship between anxiety and self-efficacy, with cognitive flexibility as a mediating variable, among female students at the Islamic Azad University of Garmsar. This study is theoretically grounded in the cognitive-behavioral framework, which emphasizes the role of cognitive processes in shaping emotional and behavioral outcomes. From this perspective, anxiety can impair flexible cognition, thereby reducing one's sense of self-efficacy. Conversely, strengthening cognitive flexibility may reduce anxiety's disruptive impact and enhance adaptive self-beliefs (24, 25). Moreover, this study draws upon empirical findings that validate the role of cognitive mediators in shaping psychological resilience, emotional stability, and functional behavior under stress.

By focusing on a sample of female university students, this research seeks to fill a gap in the literature regarding gender-specific mechanisms that influence the anxiety–self-efficacy relationship. Understanding the mediating function of cognitive flexibility may not only advance theoretical models of psychological adjustment but also contribute to the development of effective support programs and mental health interventions tailored to the needs of female students in university settings. Such findings hold particular importance in academic environments where high-performance expectations and competitive pressures heighten emotional vulnerability and compromise cognitive adaptability.

In sum, this study hypothesizes that anxiety will negatively predict self-efficacy both directly and indirectly through cognitive flexibility, which is expected to function as a significant mediator in this relationship. By exploring this mediational pathway, the research aims to contribute to a deeper understanding of how psychological and cognitive variables interact in shaping students' academic and emotional experiences. The findings are expected to inform the design of cognitive-behavioral training programs, stress-reduction workshops, and educational counseling services aimed at enhancing student well-being and academic achievement in higher education institutions.

2. Methods and Materials

2.1. Study Design and Participants

The present study is a fundamental research in terms of its aim and, given the nature of the subject, a descriptive study using a path analysis method within the framework of correlational research. The statistical population consisted of all students at the Islamic Azad University, Garmsar Branch, in the year 2024. The sampling method employed was purposive sampling. According to research guidelines related to correlational studies and based on the recommendations of Tabachnick and Fidell (2007)—who suggest that for correlational studies, five participants should be selected per item—the sample size was determined. Given that the total number of items was 58, the required sample size was calculated to be 290 participants. In the present study, using convenience sampling and excluding incomplete questionnaires, a total of 295 completed questionnaires were collected.

2.2. Measures

2.2.1. Self-Efficacy

The General Self-Efficacy Scale developed by Sherer et al. (1982) was designed to assess individuals' generalized self-efficacy beliefs and to serve as a reliable tool for future research. The original version included 36 items, but based on factor analysis, only 23 items with factor loadings above 0.40 on general and social self-efficacy were retained. Of these, 17 items measure general self-efficacy with a reported mean of 99.57 and a standard deviation of 12.08. Reliability analysis showed a Cronbach's alpha of 0.86 for the general self-efficacy subscale and 0.71 for the social subscale. The items assess dimensions such as the tendency to initiate behavior, persistence in the face of obstacles, and sustained effort despite failure. Participants rate each item on a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly

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agree" (5). For specific items (1, 3, 8, 9, 13, 15), scoring is done in the standard left-to-right order, while the remaining items are reverse scored. The total score is interpreted based on thresholds indicating low (17–34), moderate (34–51), and high (above 51) self-efficacy levels. Construct validity has been confirmed through correlations with other scales. Criterion validity was supported by studies showing that individuals with successful experiences in education, employment, or military service exhibited higher self-efficacy scores. In Iran, the scale was used by Barati in 1997, who reported satisfactory validity and reliability, with a split-half reliability coefficient of 0.76 and Guttman's method yielding 0.75, confirming the tool's utility in assessing general self-efficacy in diverse populations (11).

2.2.2. *Cognitive Flexibility*

The Cognitive Flexibility Inventory (CFI), developed by Dennis and Vander Wal (2010), is a 20-item self-report instrument designed to measure an individual's ability to replace maladaptive thoughts with more adaptive alternatives, particularly within the context of cognitive-behavioral therapy. It assesses the specific type of cognitive flexibility needed to challenge dysfunctional beliefs and to adopt more constructive perspectives in response to difficult situations. The scale is suitable for both clinical and non-clinical populations and is particularly useful in assessing progress in therapeutic interventions for depression and related disorders. Each item is rated on a 7-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7), resulting in a total score ranging from 20 to 140. In the Iranian adaptation by Shareh and colleagues, three subscales were identified—Alternatives, Control, and Alternatives for Human Behaviors—although the component scores were not separately reported in the present study. The CFI demonstrated strong psychometric properties, including a convergent validity coefficient of 0.75 with Martin and Rubin's Cognitive Flexibility Scale and a negative correlation of -0.39 with the Beck Depression Inventory-II (BDI-II), supporting its construct validity. In Iranian validation studies, the scale showed excellent internal consistency with a Cronbach's alpha of 0.90 and a test-retest reliability coefficient of 0.71, confirming the stability of the measure over time. This instrument has proven valuable for both diagnostic and intervention purposes in assessing flexible thinking patterns, especially among populations vulnerable to emotional distress (12, 24).

2.2.3. *Anxiety*

The Beck Anxiety Inventory (BAI), developed by Beck et al. in 1988, is a widely recognized and empirically validated tool designed to assess the severity of anxiety symptoms in adolescents and adults. The inventory consists of 21 items, each reflecting a common symptom of anxiety, including cognitive, somatic, and panic-related features. Respondents are asked to rate how much they have been bothered by each symptom during the past week on a 4-point Likert scale ranging from 0 (not at all) to 3 (severely), yielding a total score that ranges from 0 to 63. The BAI is especially useful for distinguishing between anxiety and depression and is frequently used in clinical, research, and therapeutic contexts. The internal consistency of the BAI is high, with a Cronbach's alpha of 0.92, and test-retest reliability over one week is reported at 0.75. Item-total correlations range from 0.30 to 0.76, further confirming the scale's reliability. Various types of validity—including content, concurrent, construct, diagnostic, and factorial—have been established in both international and Iranian contexts, supporting its robustness as a clinical instrument. Although specific scoring guidelines and interpretations were provided in a PDF format in the original study, it is well established that scores between 0–21 indicate low anxiety, 22–35 moderate anxiety, and 36 or higher reflect severe anxiety (25). In this study, the BAI provided a reliable and comprehensive assessment of participants' anxiety levels, facilitating its use in path analysis models to examine the relationship between anxiety, cognitive flexibility, and self-efficacy.

2.3. *Data Analysis*

To analyze the research data, multiple regression analysis and Pearson correlation were used. All statistical analyses were conducted using SPSS software version 25 and Amos, with the significance level set at $p < .05$.

3. Findings and Results

The participants in the study had a mean age of 23.41 years with a standard deviation of 6.45. Regarding marital

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status, 182 participants (61.7%) were single, 112 participants (38%) were married, and one participant was divorced. One individual did not respond to the marital status question. In terms of educational attainment, 103 participants (34.9%) held a high school diploma, 145 participants (49.2%) had a bachelor's degree, 44 participants (14.9%) held a master's degree, and 3 participants (1%) had a doctoral degree.

Table 1

Means, Standard Deviations, Skewness, and Kurtosis of the Study Variables

Variable	Mean	Standard Deviation	Kurtosis	Skewness
Anxiety	41.75	3.76	-0.09	-0.29
Self-Efficacy	78.93	11.62	-0.41	0.74
Cognitive Flexibility	90.22	8.99	0.34	0.63

The results presented in Table 1 indicate that the distributions of the variables—anxiety, self-efficacy, and cognitive flexibility—are normal. This is supported by the skewness and kurtosis values for all variables, which fall within the acceptable range of ±1, suggesting no significant deviation from normality and supporting the use of parametric statistical tests.

Before conducting the main analyses, the assumptions of multiple regression and path analysis were examined. The assumption of normality was assessed through skewness and kurtosis values, which were found to be within the acceptable range (±2), indicating that the data were approximately normally distributed. Linearity was confirmed through scatterplots, showing a linear relationship between the variables. The assumption of multicollinearity was tested using Variance Inflation Factor (VIF) values, all of which were below the threshold of 10, indicating no serious multicollinearity issues. Additionally, the Durbin-Watson statistic was within the acceptable range (1.5–2.5), confirming the independence of residuals. Homoscedasticity was also supported based on the examination of residual plots, indicating that the variance of the errors was constant across all levels of the independent variables.

Table 2

Pearson Correlation Coefficients and Significance Levels Between Study Variables

Variable	1	2	3
1. Anxiety	—	-0.52** (p < .001)	-0.46** (p < .001)
2. Self-Efficacy	—	0.59** (p < .001)	
3. Cognitive Flexibility	—		

As shown in Table 2, anxiety was significantly and negatively correlated with both self-efficacy (r = -0.52, p < .001) and cognitive flexibility (r = -0.46, p < .001), indicating that higher levels of anxiety are associated with lower levels of these two variables. Moreover, there was a significant positive correlation between self-efficacy and cognitive flexibility (r = 0.59, p < .001), suggesting that as cognitive flexibility increases, so does self-efficacy.

Table 3

Goodness-of-Fit Indices for the Structural Equation Model

Fit Index	Value	Recommended Threshold
χ^2 (Chi-Square)	174.38	—
df (Degrees of Freedom)	89	—
χ^2/df	1.96	< 3
GFI	0.93	≥ 0.90
AGFI	0.90	≥ 0.90
CFI	0.96	≥ 0.95
TLI	0.95	≥ 0.95
RMSEA	0.047	< 0.06

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The model fit indices presented in Table 3 indicate an acceptable to excellent model fit. The chi-square statistic (χ^2 = 174.38, df = 89) and the ratio of chi-square to degrees of freedom (χ^2/df = 1.96) fall within the acceptable range. Additionally, GFI (0.93), AGFI (0.90), CFI (0.96), and TLI (0.95) all exceed the recommended thresholds of 0.90 or higher. The RMSEA value of 0.047 indicates a good fit, being well below the cutoff of 0.06. These results confirm the structural model's adequacy for further analysis.

Table 4

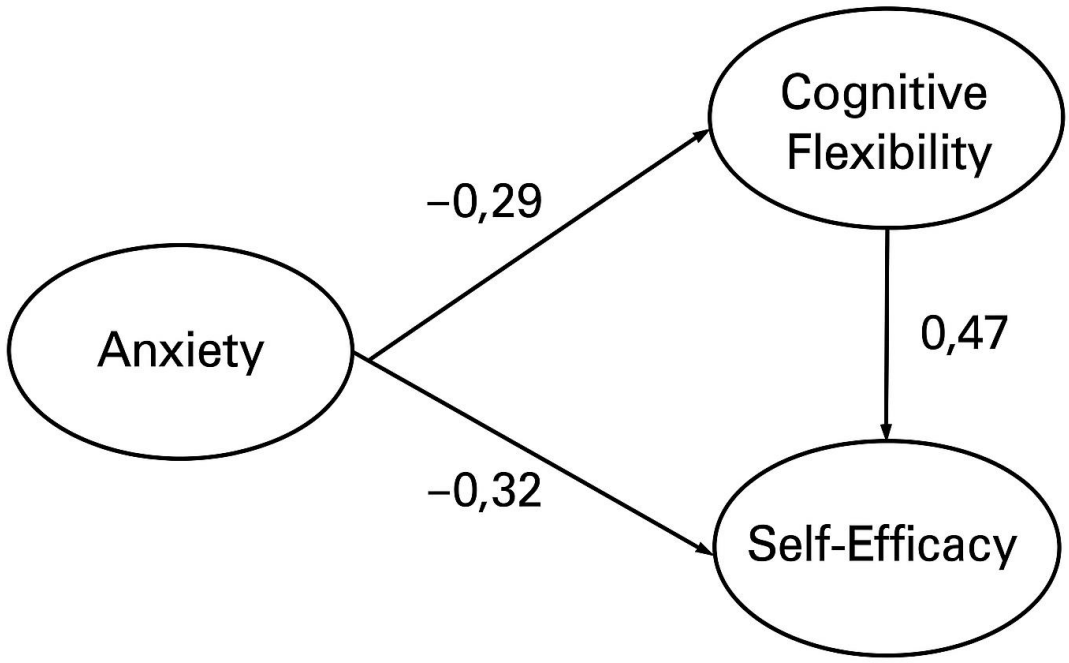
Total, Direct, and Indirect Effects of the Structural Model Paths

Path	b	S.E.	Beta	p
Anxiety → Self-Efficacy (Direct)	-0.51	0.08	-0.38	< .001
Anxiety → Cognitive Flexibility	-0.44	0.07	-0.36	< .001
Cognitive Flexibility → Self-Efficacy	0.63	0.09	0.47	< .001
Anxiety → Self-Efficacy (Indirect)	-0.28	0.06	-0.17	< .001
Anxiety → Self-Efficacy (Total)	-0.79	0.07	-0.55	< .001

As shown in Table 4, the direct path from anxiety to self-efficacy was significant (b = -0.51, β = -0.38, p < .001), indicating that higher anxiety is directly associated with lower self-efficacy. Additionally, anxiety negatively predicted cognitive flexibility (b = -0.44, β = -0.36, p < .001), and cognitive flexibility, in turn, positively predicted self-efficacy (b = 0.63, β = 0.47, p < .001). The indirect effect of anxiety on self-efficacy through cognitive flexibility was also significant (b = -0.28, β = -0.17, p < .001), supporting the mediating role of cognitive flexibility. The total effect of anxiety on self-efficacy (combining direct and indirect effects) was substantial and significant (b = -0.79, β = -0.55, p < .001), suggesting that anxiety affects self-efficacy both directly and through cognitive flexibility.

Figure 1

Model with Beta Coefficients



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4. Discussion and Conclusion

The present study examined the relationship between anxiety and self-efficacy among female university students, with a focus on the mediating role of cognitive flexibility. The results provided strong empirical support for the proposed structural model. Specifically, anxiety was found to have a significant and negative direct effect on self-efficacy. Furthermore, anxiety negatively predicted cognitive flexibility, and cognitive flexibility positively influenced self-efficacy. Importantly, the indirect effect of anxiety on self-efficacy through cognitive flexibility was also statistically significant, confirming the mediating role of this cognitive variable. These findings highlight the complex psychological interplay between emotional distress and personal competence beliefs in academic contexts, especially for female students who often face heightened academic and social pressures.

The significant and negative relationship between anxiety and self-efficacy observed in this study aligns with existing literature that has consistently demonstrated the detrimental impact of anxiety on individuals' perceptions of their abilities. Previous studies have shown that heightened anxiety impairs concentration, decreases motivation, and fosters avoidance behaviors—all of which undermine self-efficacy (7, 9). In the present study, participants who reported higher levels of anxiety tended to exhibit lower self-efficacy scores, which supports the idea that anxiety operates as a cognitive and emotional barrier to effective performance and goal-directed behavior. Bandura's social cognitive theory posits that emotional states, including anxiety, serve as one of the major sources of efficacy information—especially when individuals interpret physiological arousal as a sign of anticipated failure rather than a challenge to overcome (9).

Additionally, the study confirmed a significant negative relationship between anxiety and cognitive flexibility. This result is consistent with research showing that anxiety constricts executive functioning, particularly mental set-shifting and attentional control—core components of cognitive flexibility (2, 3). Cognitive inflexibility among anxious individuals may manifest as rumination, catastrophizing, and repetitive negative thinking, all of which limit their ability to shift mental frameworks or consider alternative solutions (4, 13). The current study supports this perspective, as students with higher anxiety demonstrated reduced capacity for flexible thinking. This finding is also corroborated by evidence that anxiety reduces the brain's ability to engage prefrontal regulatory networks, thereby impairing adaptability and resilience (3).

The significant positive association between cognitive flexibility and self-efficacy found in this study is supported by a range of previous research. Individuals with greater cognitive flexibility are better equipped to reappraise challenging situations, generate alternative solutions, and maintain a sense of agency in the face of setbacks (11, 14). These adaptive strategies strengthen self-efficacy by reinforcing the belief that one can manage future difficulties effectively. The participants in this study who reported higher levels of cognitive flexibility also showed increased self-efficacy, consistent with theoretical frameworks that position flexible thinking as a precursor to positive self-beliefs (12, 24). Moreover, self-efficacy itself is shaped through mastery experiences, vicarious learning, and emotional regulation—processes that are facilitated by flexible cognitive processing (5).

One of the key contributions of this study is the confirmation of cognitive flexibility as a significant mediator in the relationship between anxiety and self-efficacy. The data indicated that anxiety diminishes self-efficacy not only directly but also indirectly by impairing cognitive flexibility. This mediating pathway is in line with cognitive-behavioral models which posit that maladaptive emotional responses influence outcomes primarily through their effects on cognitive processing (11, 12). The significant indirect path observed in this study provides a mechanistic explanation for how anxiety undermines self-efficacy—namely, by reducing the individual's ability to shift perspectives, regulate negative thoughts, and engage in problem-solving. This aligns with the findings of Landi (2022), who demonstrated that enhancing cognitive flexibility through intervention reduced anxiety symptoms and improved self-efficacy in university students (15).

The cultural and gender-specific context of this study further strengthens the relevance of these findings. Research has shown that female students often report higher anxiety and lower self-efficacy than their male counterparts, particularly in academic settings where societal expectations and performance pressure are prevalent (22, 23). Cognitive

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flexibility, in this context, may serve as a psychological buffer that allows female students to manage these stressors more effectively. The results support the view that enhancing cognitive adaptability could be especially beneficial for populations vulnerable to academic anxiety and self-doubt (17). By promoting cognitive restructuring and perspective-taking, educational institutions can help female students develop stronger self-efficacy beliefs despite cultural or systemic challenges.

The results also highlight the need for targeted interventions within university settings. Given the strong correlations between cognitive flexibility and both anxiety and self-efficacy, university counseling services could incorporate cognitive flexibility training into their existing programs. Techniques such as mindfulness-based cognitive therapy, cognitive restructuring, and adaptive problem-solving have shown promise in previous research for improving cognitive flexibility and reducing emotional distress (11, 14). The current findings reinforce the importance of these strategies, not only for reducing anxiety but also for enhancing students' confidence in their abilities to succeed academically and emotionally.

The theoretical implications of these findings also contribute to a broader understanding of academic success and psychological resilience. Traditionally, predictors of academic performance have focused on cognitive intelligence and motivation. However, this study supports more integrative models that incorporate emotional and cognitive variables such as anxiety regulation, self-efficacy, and cognitive flexibility (18, 20). Students who possess higher levels of cognitive flexibility are better able to adapt to shifting academic demands, reinterpret failures as learning opportunities, and maintain engagement with challenging material. These cognitive traits, in turn, promote stronger self-efficacy and reduce the paralyzing effects of academic anxiety (19, 21).

In sum, the findings of this study support a dynamic interaction between anxiety, cognitive flexibility, and self-efficacy in female university students. Anxiety was shown to negatively influence both self-efficacy and cognitive flexibility, while cognitive flexibility positively predicted self-efficacy. Most notably, cognitive flexibility served as a significant mediator, explaining part of the mechanism through which anxiety exerts its detrimental effects on self-efficacy. These results not only confirm prior theoretical models and empirical research but also offer a nuanced understanding of the psychological processes that shape academic resilience and well-being in university populations. Given the significance of these findings, greater emphasis should be placed on enhancing flexible cognitive skills as part of psychological interventions aimed at improving students' academic confidence and emotional health.

Despite the valuable findings, this study has certain limitations that should be acknowledged. First, the cross-sectional design limits the ability to infer causal relationships among the variables. Although the structural model supports a directional hypothesis, longitudinal data would be needed to confirm temporal ordering. Second, the study relied entirely on self-report measures, which may be subject to response biases such as social desirability or inaccurate self-assessment. Third, the sample was limited to female students from a single branch of the Islamic Azad University, which may restrict the generalizability of the findings to other populations or cultural contexts. Lastly, while the study focused on cognitive flexibility as a mediator, other potential mediating or moderating variables—such as emotional intelligence, coping strategies, or social support—were not examined.

Future research should consider adopting longitudinal designs to examine the directionality and stability of the relationships between anxiety, cognitive flexibility, and self-efficacy over time. Experimental studies that include cognitive flexibility training interventions would be particularly valuable in determining the effectiveness of such programs in reducing anxiety and enhancing self-efficacy. Moreover, expanding the sample to include male students, students from other academic institutions, or cross-cultural samples would enhance the generalizability and robustness of the findings. Additionally, future studies could explore the role of other cognitive and emotional variables—such as metacognitive beliefs, attentional control, or resilience—as mediators or moderators in this psychological network.

University counselors, psychologists, and educators should prioritize interventions that enhance cognitive flexibility as part of broader efforts to support students' mental health. Training programs that include mindfulness,

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cognitive restructuring, and adaptive problem-solving can help students reinterpret stressors, manage anxiety, and build stronger self-efficacy. Academic support services should integrate psychological skill-building into workshops and seminars, helping students to develop flexible thinking habits that contribute to academic persistence and emotional resilience. Furthermore, creating supportive and non-judgmental learning environments can reduce anxiety and promote confidence, particularly among female students who may experience heightened performance-related stress. These strategies can contribute to fostering a healthier, more adaptive, and successful academic experience.

Authors' Contributions

M. M. D. B. developed the research framework, conducted the literature review, and collected the data. H. K. designed the methodology, performed statistical analyses, and interpreted the results. Both authors contributed to writing and revising the manuscript and approved the final version for publication.

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.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki. Ethical considerations included obtaining informed consent, ensuring confidentiality and anonymity, and avoiding any harm to participants.

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