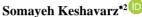# The Relationship between the Perception of Family Functioning and Distress Tolerance with Academic Self-Discipline: The Mediating Role of Mental Vitality

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A R T I C L E I N F O

ABSTRACT

The present study aimed to investigate the relationship between perceived family functioning, distress tolerance, and academic self-regulation, with the mediating role of mental vitality. The research method was correlational, using structural equation modeling. The statistical population included all students at Imam Khomeini International University (IKIU) during the 2023-2024 academic year, from which 260 individuals were selected as the study sample through cluster random sampling. The research instruments included questionnaires on family functioning, academic self-regulation, distress tolerance, and mental vitality. The collected data were analyzed using structural equation modeling (SEM) via AMOS-24 software. The findings indicated that the conceptual model of the study had a good fit. Examination of direct paths revealed that family functioning and distress tolerance had a positive relationship with academic self-regulation. Additionally, the results of indirect path analysis showed that mental vitality mediated the relationship between academic self-regulation and both family functioning and distress tolerance. Family functioning, distress tolerance, and mental vitality can be considered key factors in enhancing students' academic self-regulation.

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Introduction

The transition to university life exposes students to various academic, emotional, and social challenges, requiring them to adopt effective strategies for success. Among the factors influencing students' ability to manage these challenges, family functioning emerges as a key foundational context. The family environment not only plays a crucial role in personal and social development but can also be a determining factor in students' adaptation to the academic setting. One critical factor nurtured within the family context is academic self-regulation (Ardavan Takin, 2024).

Academic self-regulation refers to the ability to regulate behavior, set and achieve long-term academic goals, and resist short-term distractions or temptations (Erol et al., 2024). This capacity encompasses essential skills such as time management, perseverance, and self-control, which are vital for navigating the demands of higher education (Maboloka et al., 2021). Numerous studies have demonstrated that self-regulation is a strong predictor of academic performance, underscoring its central role in determining educational outcomes (Sanardi et al., 2022; Zimmerman & Kitsantas, 2014). However, the development and maintenance of academic self-discipline are not solely individual endeavors; they are influenced by broader psychological and environmental factors (Neslen, 2011).

One of the most influential external factors shaping academic self-regulation is perceived family functioning. Family functioning refers to the degree to which a family system is cohesive, supportive, and effective in addressing its members' needs (Hung et al., 2021). A well-functioning family environment provides emotional security, problem-solving skills, and a strong foundation of resilience—all of which are essential for fostering academic self-regulation (Wang et al., 2021). Conversely, dysfunctional families, characterized by poor communication, high conflict, or lack of support, can undermine students' ability to maintain focus, regulate emotions, and persist in academic tasks (Agustin, 2024). Family functioning, particularly in dimensions such as emotional support, cohesion, and parenting practices, can enhance students' academic motivation and planning (Gillies et al., 2021).

Another factor influencing academic self-regulation is distress tolerance. Students with higher distress tolerance are typically better at managing their emotions and maintaining focus on academic tasks despite stressors and pressures. This trait enables them to allocate time and resources more effectively, sustaining motivation and performance in challenging academic situations (Eisenbeck et al., 2019). Distress tolerance is a key factor in

students' ability to maintain academic self-regulation under stress. This variable, shaped within the family context, reflects an individual's capacity to manage negative emotions and persist in goal-directed behaviors even in challenging circumstances (Jabin & Dildar, 2023; Larazabal et al., 2022). A supportive family environment that provides a safe space for emotional expression, positive parenting strategies, and emotional security can enhance this ability. In contrast, families marked by high internal conflict, authoritarian parenting, or insecure attachment patterns may diminish children's distress tolerance, making them more vulnerable to academic stressors (Agustin, 2024).

Students with high distress tolerance and strong family support can navigate academic adversities—such as heavy workloads, exam pressure, and educational expectations—without losing focus or motivation. Rather than reacting with negative emotions or avoidance, they employ more effective coping strategies and remain committed to their academic goals (Azjan, 2024). Conversely, students raised in high-conflict or emotionally unsupportive families often exhibit lower distress tolerance, leading to heightened anxiety, frustration, or task avoidance, which directly undermines their academic self-regulation. Research indicates that low distress tolerance, often rooted in early family experiences, is associated with procrastination, reduced concentration, and heightened negative emotional responses under pressure—all of which hinder time management and academic goal pursuit (Robinson et al., 2021; Slabbert et al., 2021). Importantly, distress tolerance not only directly affects self-discipline but also interacts with other psychological factors, such as mental vitality.

Mental vitality, defined as psychological energy and motivation, sustains active engagement in meaningful activities and plays a central role in linking environmental and psychological factors to academic self-regulation. Students with high mental vitality demonstrate greater resilience, enthusiasm, and focus, enabling them to persevere through challenges and maintain constructive habits (Rahaei & Taghvaeenia, 2024). The mediating role of mental vitality in the relationship between perceived family functioning, distress tolerance, and academic self-regulation is a key aspect of understanding these variables' interplay. A positive, supportive family environment enhances psychological support, which in turn boosts mental vitality. Mental vitality, as a positive and active psychological state, helps individuals cope more effectively with life's stressors and challenges (Shamshadi et al., 2023). In other words, individuals with higher mental vitality not only manage distress better but also apply self-regulatory skills more effectively. Despite academic pressures, they maintain focus and optimally allocate mental energy to tasks (Rahaei et al., 2024). Overall, mental

vitality acts as a mediator in this process, enabling individuals to balance psychological capacities with environmental demands, ultimately improving academic self-regulation. Thus, family supports that enhances mental vitality may indirectly strengthen academic self-regulation by improving distress tolerance. Mental vitality is strongly linked to psychological well-being, enhancing not only academic performance but also overall life satisfaction (Fathi et al., 2023). These interrelated variables—academic self-regulation, perceived family functioning, distress tolerance, and mental vitality—form a dynamic framework for understanding student academic success. Despite the individual importance of each factor, limited research has examined their collective impact in the university context. This study addresses this gap by investigating how family functioning and distress tolerance, mediated by mental vitality, influence academic self-regulation. By exploring these relationships, this research seeks to understand the interplay between academic self-regulation, family functioning, distress tolerance, and mental vitality to address the challenges students face in achieving academic success. While these factors have been studied separately, their combined effects remain underexplored. Given the increasing academic and psychological pressures on university students, identifying these interconnected pathways is critical for developing targeted interventions and support systems. By elucidating these relationships, this study not only advances theoretical understanding but also provides practical insights for educators, counselors, and policymakers to enhance student well-being and performance. Based on the aforementioned points, the main research question of the present study is whether there is a relationship between perceived family functioning and distress tolerance with students' academic self-regulation, mediated by mental vitality?

Methods

The research methodology employed in this study was descriptive and correlational, based on structural equation modeling (SEM). The statistical population consisted of all students at Imam Khomeini International University during the 2023–2024 academic year. From this population, 260 individuals were selected as the research sample using a cluster random sampling method. The sample size was determined based on the rule of thumb for observed variables, which recommends five, ten, fifteen, or twenty participants per observed variable (Kline, 2015). Considering a criterion of fifteen participants per observed variable and the presence of 16 observed variables in the model (Figure 1), a sample size of 260 participants was finalized (slightly above the threshold and after excluding data from 20 individuals who had incompletely responded to the questionnaires). Inclusion

criteria consisted of Enrollment at Imam Khomeini International University and absence of diagnosed psychological disorders. exclusion criteria was Presence of diagnosed psychological disorders. for demographic and descriptive analysis (mean and standard deviation), SPSS software version 26 was used. To assess the goodness-of-fit of the proposed model with the collected data and to test research hypotheses, Amos software version 24 was utilized.

Instruments

Family Assessment Device (FAD): This scale was developed by Epstein and colleagues in 1983 with the aim of assessing family functioning based on the McMaster model. This model defines structural, occupational, and interactive characteristics of families and identifies six dimensions of family functioning. The scale consists of 53 items scored on a Likert scale ranging from "strongly agree" (score 1) to "strongly disagree" (score 4). A total score below 110 indicates family dysfunction. These dimensions include: problem-solving, communication, roles, affective involvement, affective responsiveness, behavioral control, and general family functioning. Accordingly, the Family Assessment Test aligns with these six dimensions and comprises six subscales to measure them, along with one additional subscale related to general family functioning. The creators of the questionnaire evaluated its criterion validity using the Locke-Wallace marital satisfaction scale, reporting a correlation coefficient of .73 and Cronbach's alpha coefficients for reliability ranging from .72 to .92. Yusefi (2011) determined the divergent and convergent validity of this questionnaire with the communication patterns scale and locus of control scale as follows: .46, .36, -.41, and -.43 respectively, and obtained a Cronbach's alpha coefficient of .86 for the scale. The internal consistency of the total score in this study sample was calculated using Cronbach's alpha method as .78.

Distress Tolerance Scale: The Distress Tolerance Scale, developed by Simons and Gaher in 2005, is a 15-item self-report tool that asks participants to rate their level of agreement or disagreement with statements on a 5-point Likert scale ranging from "strongly agree" (1) to "strongly disagree" (5). Higher scores indicate greater distress tolerance. This scale evaluates four aspects of distress tolerance: 1) tolerance, 2) appraisal, 3) absorption, and 4) regulation. Distress tolerance has shown significant negative correlations with measures of emotional distress (-.59) and dysregulation (-.51), and a positive significant correlation with measures of positive affectivity (.26). Cronbach's alpha coefficients for the subscales—tolerance, appraisal, absorption, and regulation—were reported as .73, .84, .7**7**, and .76, respectively (Simons & Gaher, 2005). in Iran, Tafangchi and colleagues assessed the psychometric

properties of this scale and found actor loadings for all components above .45 through confirmatory factor analysis. The reliability of the scale was calculated using Cronbach's alpha method as .84. Furthermore, the internal consistency of the total score in the current research sample was computed using Cronbach'**s** alpha method as .88**.**

The Self-Regulation Questionnaire for Academic Achievement: It was developed by Afrouz in 2007 to assess academic self-regulation and consists of 31 questions organized into four primary dimensions of academic self-regulation: external regulation, introjected regulation, identified regulation, and intrinsic motivation. Each dimension addresses a specific aspect, allowing researchers to obtain a comprehensive picture of participants' learning and study habits. Responses to the questionnaire are based on a four-point Likert scale, where respondents choose from "not at all true," "not very true," "somewhat true," or "very true," with scores ranging from 1 to 4. The total score for academic self-regulation is calculated by summing the scores for all questions. The content validity of the questionnaire was confirmed using factor analysis, with factor loads for all questions exceeding .40, indicating that the questions comprehensively cover various aspects of academic self-regulation. The reliability of the questionnaire was assessed using Cronbach's alpha, with value**s** above .85, and internal consistency ranged from .81 to .93, reflecting high reliability and trustworthiness in measuring academic self-regulation. In the current study, the reliability coefficient for this tool was estimated at .82 using Cronbach's alpha.

The Mental Vitality Scale: it was designed by Ryan and Frederick in 1997, is used to assess individuals' level of vitality and mental well-being. This scale consists of 7 questions, each directly addressing the experience of vitality and well-being in life. The score range for this scale is between 7 and 49, with higher scores indicating greater mental vitality. Responses are based on a 7-point Likert scale, varying from "strongly disagree" to "strongly agree." The scale is unidimensional, measuring a single aspect of mental vitality. The validity of the scale was confirmed using factor analysis in the original version, with factor loads for all questions exceeding .40, and reliability was calculated using Cronbach's alpha as .89. In Iran, Rashwanlu and colleagues (2018) validated the scale, reporting factor loads above .44 through confirmatory factor analysis and a reliability coefficient of.81 using Cronbach's alpha. In the current study, the reliability coefficient for this tool was estimated at .69 using Cronbach's alpha.

The method of execution was as follows: Initially, five faculties were randomly selected from a total of seven faculties, including Islamic Research

Sciences, Social Sciences, Basic Sciences, Engineering, and Humanities. Then, five classes were randomly chosen from each faculty. After explaining the research objectives and ethical principles, participants were invited to participate in the study and respond to self-reporting tools (which did not require disclosure of names). The ethical principles in this study included informed and voluntary consent, the right to withdraw from the research, confidentiality/privacy, and avoidance of causing harm or damage resulting from participation in the research.

Findings

57.70% (150 individuals) of the sample group consisted of female students, and 42.30% (110 individuals) consisted of male students. 78% (203 individuals) of the sample group were between the ages of 18 to 25, while 22% (57 individuals) were between 26 to 35 years old. 55.8% (145ndividuals) of the sample group were enrolled in the undergraduate level, 32.6% (85 individuals) in the master's level, and 11.6% (30 individuals) in the doctoral level. The descriptive indices of the variables are reported in Table 1.

Table1. Descriptive Findings of the scales

	subscales	Mean	Standard Deviation	Skewness	Kurtosis
Family Functioning	Problem-Solving	11.53	3.03	.18	-.14
	Communication	14.27	3.21	.20	.04
	Roles	19.66	3.57	-.03	.24
	Affective Involvement	15.87	2.92	.31	.01
	Affective Responsiveness	18.25	4.83	.25	.02
	Behavioral Control	18.72	3.45	.11	-.07
	General Family Functioning	26.25	5.65	-.38	-.22
	Tolerance	8.53	2.63	.14	-.30

	subscales	Mean	Standard Deviation	Skewness	Kurtosis
Distress Tolerance	Absorption	9.23	2.96	.04	.70
	Appraisal	19.58	4.76	-.09	-.10
	Regulation	8.31	2.87	.32	.58
Mental Vitality	Mental Vitality	32.32	7.61	-.56	-.09
Academic Self-Regulation	External Regulation	25.10	4.34	-.11	-.34
	Introjected Regulation	24.52	5.01	-.17	.30
	Identified Regulation	19.99	3.44	-.69	1.76
	Intrinsic Motivation	18.96	4.26	-.21	-.02

Based on the obtained results, the values of skewness and kurtosis indicate that the research variables have a normal distribution. One of the assumptions of structural equation modeling is the multivariate normality of the distribution. For this purpose, the multivariate kurtosis coefficient of Mardia is used in the AMOS software. The Mardia coefficient for the present study's data is 3.12, indicating that the assumption of multivariate normality holds. To assess univariate normality, a general criterion suggests that if skewness and kurtosis are not outside the range of (-2, 2), the data can be considered normal or approximately normal. According to the data in Table 1, the skewness and kurtosis indices of all indicators are within the range of (-2, 2), and thus they can be regarded as normal or approximately normal. To evaluate the absence of multicollinearity between the independent variables of tolerance and variance inflation factor, the results are presented in the table below.

Table2: Tolerance and variance inflation factor (VIF) to evaluate the absence of multicollinearity between independent variables

Predictor variables	Tolerance	Variable inflation factor
Problem Solving	.66	1.53
Communication	.67	1.52
Roles	.59	1.70
Affective Involvement	.63	1.59
Affective Responsiveness	.81	1.23
Behavioral Control	.84	1.18
General Performance	.79	1.26
Tolerance	.58	1.72
Absorption	.63	1.59
Evaluation	.80	1.25
Adjustment	.68	1.51
Mental Vitality	.59	1.71

In the table above, since the tolerance index is close to 1, none of the predictor variables have multicollinearity with other predictor variables. Additionally, the variance inflation factor (VIF) is less than 2, indicating that there is no multicollinearity among the predictor variables. considering that the basis of structural equation modeling relies on the variance-covariance or correlation matrix between variables, the correlation matrix among the research variables is reported in the table below.

Table3. Correlation Matrix of Observed Variables in the Study

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Problem solving	1															
2. Communication	.48	1														
3. Roles	.48	.59	1													
4. Affective Involvement	.44	.57	.64	1												
5. Affective Responsiveness	.57	.55	.42	.63	1											
6. Behavioral control	.38	.62	.42	.27	.71	1										
7. General performance	.61	.33	.55	.47	.37	.55	1									
8. Tolerance	.28	.29	.29	.38	.33	.47	.23	1								
9. Absorption	.55	.37	.38	.34	.41	.32	.41	.48	1							
10. Evaluation	.50	.23	.12	.40	.29	.47	.50	.34	.13	1						
11. Adjustment	.27	.33	.43	.45	.58	.47	.08	.11	.55	.29	1					
12. Mental vitality	.44	.34	.36	.39	.45	.56	.22	.61	.45	.33	.28	1				
13. External regulation	.27	.58	.57	.51	.48	.45	.30	.48	.31	.39	.23	.11	1			
14. Introjected regulation	.51	.08	.28	.33	.41	.52	.30	.13	.32	.10	.28	.34	.08	1		
15. Identified regulation	.58	.34	.41	.32	.43	.09	.28	.33	.22	.27	.52	.32	.47	.23	1	
16. Intrinsic motivation	.44	.40	.59	.47	.50	.34	.41	.32	.42	.45	.35	.40	.30	.29	.44	1

The results of the above table indicate that the relationship between the research variables is significant at a 95% confidence level (*P-value* < .01). In this section, the findings related to the fit of the measurement model are first reported.

Table 4. coefficients and significance of factor loadings for measurement models

Scale	Component	Standardized Weight	t-statistic	p-value
Family Functioning	Problem Solving	.87	-	.001
	Communication	.79	16.30	.001
	Roles	.84	17.98	.001
	Affective Involvement	.76	15.23	.001
	Affective Responsiveness	.88	19.73	.001
	Behavior Control	.75	15.02	.001
	General Functioning	.92	22.02	.001
Mental Vitality	Item 1	.56	-	.001
	Item 2	.60	11.21	.001
	Item 3	.68	11.37	.001
	Item 4	.56	10.99	.001
	Item 5	.65	11.30	.001
	Item 6	.66	11.33	.001
	Item 7	.63	11.27	.001
Distress Tolerance	Tolerance	.84	-	.001
	Absorption	.86	15.17	.001
	Appraisal	.80	14.33	.001
	Regulation	.81	14.37	.001
Academic Self-Regulation	External Regulation	.78	-	.001
	Introjected Regulation	.69	11.03	.001
	Identified Regulation	.87	14.90	.001
	Intrinsic Motivation	.75	12.02	.001

The results from the table above indicate that all factors across the scales exhibit significant factor loadings at a 95% confidence level. The findings related to the initial model implementation in standardized form, along with some of the most important goodness-of-fit indices for the initial model, are presented in the figure and table below. The goodness-of-fit indices in Table 5 demonstrate that the research model has an acceptable fit. It should be noted that covariances were established between the errors of certain components to improve the model's fit indices. To evaluate the fit of the measurement model, indices such as the ratio of chi-square to degrees of freedom, root mean square error of approximation (RMSEA), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), incremental fit index (IFI), comparative fit index (CFI), and the parsimonious goodness of fit index

(PGFI) were used. The coefficient of determination for academic self-regulation in the revised model is 0.47, indicating that exogenous and mediating variables can predict 47% of variance in academic self-regulation.

Table 5. Goodness-of-Fit Indices of the Research Model

Fit Indices	χ^2/df	GFI	PCFI	PNFI	CFI	IFI	RMSEA
Research Model	1.964	.912	.784	.791	.949	.928	.060

Acceptable Thresholds for Fit Indices: PCFI, PNFI (> .5), CFI, GFI, IFI (> .9), RMSEA (< .8), CMIN/DF (< 3 is good, < 5 is acceptable)

Figure 1. The model in the standardized coefficients state

Table6. Coefficients and significance of the direct effects of research variables

Criterion Variable	Predictor Variable	Type of Effect	Unstandardized Coefficient	Standardized β	t	p-value
Academic Self-Regulation	Perceived Family Performance	Direct	.63	.29	4.56	.001
Academic Self-Regulation	Distress Tolerance	Direct	.87	.44	7.89	.001
Academic Self-Regulation	Mental Vitality	Direct	.73	.45	7.91	.001
Mental Vitality	Perceived Family Performance	Direct	.58	.32	4.64	.001
Mental Vitality	Distress Tolerance	Direct	.79	.39	5.86	.001

According to the test of coefficients in Figure 1 and the results of the above table, the standardized path coefficients were significant at a 95% confidence level. The direct relationship between family performance perception and academic self-regulation was (t = 4l56, β = o29), the direct relationship between distress tolerance and academic self-regulation was (t = 7.89, β = .44), the direct relationship between mental vitality and academic self-regulation was (t = 7.91, β = .45), the direct relationship between family performance perception and mental vitality was (t = 4.64, β = .32), and the direct relationship between distress tolerance and mental vitality was (t = 5.86, β = .39). To examine the mediating role of mental vitality in the relationship between family performance perception and distress tolerance with academic self-regulation among students, the bootstrap test was used, and the results are presented in Table 5.

Table7. Coefficients and significance of the indirect effect of perceived family performance and Distress Tolerance on academic self-regulation

Criterion Variable	Predictor Variable	Type of Effect	Standardized Coefficient	Error	Lower Limit	Upper Limit	*P-value*
Academic Self-Regulation	Perceived Family Performance	Mediated by Mental Vitality	.144	.057	.182	.330	.001
Academic Self-Regulation	Distress Tolerance	Mediated by Mental Vitality	.176	.064	.217	.428	.001

The results of the above table indicate that the lower bound of the confidence interval for mental vitality as a mediator between perceived family performance and academic self-regulation is .182, and the upper bound is .330. Similarly, the lower bound of the confidence interval for mental vitality as a mediator between distress tolerance and academic self-regulation is .217, and the upper bound is .428. The confidence level for this interval is 95%, and the number of bootstrap samples is 2000. Since zero is outside this confidence interval and is statistically significant, mental vitality acts as a mediator in the relationship between family performance and distress tolerance with academic self-regulation among students.

Discussion & Conclusion

The aim of this study was to examine the relationship between perceived family functioning and distress tolerance with academic self-regulation, mediated by mental vitality among students. The findings revealed that perceived family functioning is a significant predictor of academic self-regulation, reinforcing the idea that a supportive family environment serves as a foundation for academic success. Students who live in families characterized by intimacy, open communication, and supportive relationships tend to develop higher levels of discipline and self-regulation, as they can model positive behaviors and access emotional support when facing challenges (Nelsen, 2011). These results underscore the importance of family-based interventions, particularly during early developmental stages, as they can enhance resilience, emotional regulation, and goal-setting abilities essential for academic achievement.

Conversely, students who perceive their family environment as dysfunctional—characterized by conflict, neglect, or emotional

unavailability—may struggle with emotional regulation, making it harder for them to focus on academic goals and demonstrate discipline (Galilzo et al., 2021). These students may also experience higher levels of stress, which can undermine their academic performance. Our study indicates that perceived family functioning not only directly affects academic self-regulation but also influences other psychological variables like mental vitality, which in turn contribute to academic success. These findings have significant implications for interventions aimed at improving students' academic performance. Supporting families in fostering positive communication strategies, emotional support, and conflict resolution can enhance students' capacity to develop self-discipline and other academic skills. Moreover, family therapy or counseling may be particularly beneficial for students from high-conflict or dysfunctional families by mitigating the negative effects on their academic progress.

According to the study's results, distress tolerance plays a crucial role in influencing academic self-regulation. Previous studies have also confirmed this relationship; for instance, research by Ozcan (2024) and Larrazabal et al. (2022) demonstrated that distress tolerance is associated with better coping strategies, lower levels of procrastination, and higher persistence when dealing with academic stress. This ability helps students manage negative emotions arising from academic pressures and consequently control their academic behaviors more effectively. Specifically, the ability to tolerate distress enables individuals to remain engaged in their academic activities during periods of psychological pressure and instead focus more effectively on their academic goals using adaptive strategies. This effect is particularly evident in stressful academic situations such as exams, projects, and tight deadlines, where students with higher levels of distress tolerance can manage their stress without being overwhelmed by negative emotions and use it as a motivation to strive harder. Therefore, these findings suggest that students with greater distress tolerance not only reduce negative emotions but also maintain higher motivation and pursue their academic goals more effectively. The findings also revealed an interaction between distress tolerance and mental vitality. Students with lower distress tolerance are more likely to experience emotional exhaustion, fatigue, and apathy (Larrazabal et al., 2022; Razavian et al., 2021), which can diminish their mental vitality and reduce their ability to focus and be productive. This finding highlights that distress tolerance is not only essential for managing stressors but also critical for maintaining long-term motivation and academic self-regulation. In this regard, interventions aimed at increasing distress tolerance—such as mindfulness practices, cognitive-behavioral strategies, or emotion regulation training—can be beneficial in enhancing resilience and promoting academic success. Our study demonstrates that students who can effectively regulate

their emotions are better able to maintain focus, manage distractions, and persist in challenging tasks. Thus, fostering distress tolerance may be as important as developing academic self-regulation since it provides the emotional flexibility needed to navigate the demands of university life.

A key contribution of this study is identifying mental vitality as a mediator on the relationship between perceived family functioning, distress tolerance, and academic self-regulation. The findings align with research conducted by Razavian et al. (2021), Shamshadi et al. (2023), and Fathi et al. (2022). Mental vitality—as a reflection of psychological energy, motivation, and enthusiasm—amplifies the positive effects of supportive family environments and high distress tolerance on academic self-regulation. Students with higher mental vitality who demonstrate greater engagement with their academic tasks are more likely to sustain consistent effort over time and exhibit stronger motivation to achieve their educational goals (Fathi et al., 2022). The role of mental vitality as a mediator is particularly significant because it illustrates how emotional and psychological resources—such as a positive family environment and distress tolerance—foster positive academic behaviors. Mental vitality not only facilitates persistence in facing challenges but also enhances cognitive performance, focus, and overall well-being—all of which contribute to academic success (Rahaei & Taghvaei Nia, 2024). Our findings suggest that mental vitality is not merely an outcome of academic engagement but an active driver of self-discipline that influences how students approach their studies, cope with stressors, and sustain motivation over the long term.

when students receive emotional and psychological support from their families, this sense of psychological security enhances their ability to cope with stressors and maintain motivation when confronting academic challenges. Particularly for families with positive functioning patterns, fostering confidence while reducing psychological anxiety can elevate an individual's mental vitality (Shamshadi et al., 2023). In other words, positive family functioning creates an environment filled with support and affection that helps students feel more empowered to tackle their academic difficulties. On the other hand, distress tolerance also plays a crucial role in boosting mental vitality. Students with higher abilities to tolerate stress are less affected by negative emotions triggered by challenges; this enables them to focus more effectively on their studies (Razavian et al., 2021). This characteristic becomes even more impactful when combined with familial support since individuals are better equipped to confront educational stress without feelings of confusion or helplessness while managing their psychological energy more efficiently.

This insight emphasizes the importance of cultivating mental vitality among students as it serves as a critical link between emotional/familial resources and their educational progress. Strategies aimed at enhancing mental vitality—such as promoting physical activity, mindfulness exercises, or providing educational support—can help students generate the psychological energy required for educational advancement. Additionally, creating environments that encourage emotional well-being and a sense of purpose can boost students' motivation and engagement while further strengthening their self-discipline in academics. Academic self-regulation among students can be improved through enhancing perceptions of family functioning, increasing distress tolerance levels, and fostering mental vitality. Like many studies in this field, this research faced limitations. Due to its cross-sectional design, inferring causal relationships between variables was challenging. Furthermore, since data were collected through self-reported questionnaires from participants, they were subject to biases such as social desirability bias. Therefore, future research should explore these variables within longitudinal designs or qualitative interviews for deeper insights into these relationships.

Ethical Considerations

Data availability The data supporting this study are not publicly available due to (reasons for data not being publicly available). For access, please contact the corresponding author via email.

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