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Emotion Regulation and Psychological Capital as Predictors of COVID-19 Anxiety: A Cross-Sectional Study

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ABSTRACT

The COVID-19 pandemic posed a serious threat to the mental health of university students. Accordingly, this study aimed to simultaneously examine the roles of psychological capital and emotion regulation strategies in predicting COVID-19-related anxiety in this population. This descriptive-correlational study was conducted online among 309 university students in Tehran between March and July 2021. The questionnaire link was distributed to students through WhatsApp groups. Data were collected using the Coronavirus Disease Anxiety Scale (CDAS), Psychological Capital Questionnaire (PCQ), and the short form of the Cognitive Emotion Regulation Questionnaire (CERQ). Data were analyzed using descriptive statistics, Pearson's correlation coefficient, independent-samples t test, Kruskal–Wallis test, and multiple linear regression analysis. The prevalence of severe anxiety in the study sample was 60.8%. Among the demographic variables, only sex was not significantly associated with anxiety. Marital status was significantly associated with anxiety, although the effect size was small. Younger students (aged <30 years) and undergraduate students reported significantly higher levels of anxiety than older students and those enrolled in postgraduate programs, respectively. The multiple regression model explained 63.7% of the variance in COVID-19-related anxiety. Based on the standardized beta coefficients, maladaptive emotion regulation strategies (β = 0.460) were the strongest positive predictor of anxiety, whereas self-efficacy (β = −0.284) was the strongest negative predictor. Hope (β = 0.163) also emerged as a positive predictor in the model. Resilience (β = −0.162) and optimism (β = −0.134) were significant negative predictors. Adaptive emotion regulation strategies (β = 0.032) were not statistically significant in the final model. The findings identified psychological capital, particularly self-efficacy, as a protective predictor of COVID-19-related anxiety, whereas maladaptive emotion regulation strategies emerged as the strongest positive predictor. Although the pandemic has ended, the high prevalence of anxiety among younger and undergraduate students during the peak of the crisis represents a concerning pattern. These findings underscore the need for targeted interventions that prioritize reducing maladaptive emotion regulation strategies and strengthening self-efficacy to enhance preparedness for similar crises in the future.

Keywords: COVID-19-related anxiety; emotion regulation; psychological capital; self-efficacy; maladaptive strategies; university students.

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Introduction

COVID-19-related anxiety can be conceptualized as a context-specific emotional response involving fear, worry, physiological arousal, threat monitoring, and concern regarding the direct and indirect consequences of coronavirus infection. Although some degree of anxiety is an understandable response to a potentially

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dangerous infectious disease, excessive or persistent anxiety can interfere with concentration, academic functioning, sleep, decision-making, social functioning, and general psychological well-being. The development of specific instruments for assessing coronavirus-related anxiety reflected the need to distinguish such reactions from more generalized forms of anxiety. In Iran, Alipour et al. developed the COVID-19 Anxiety Scale to assess psychological and somatic dimensions of anxiety specifically associated with the pandemic (1). Similarly, the Coronavirus Anxiety Scale proposed by Lee provided a brief screening instrument for dysfunctional anxiety responses specifically associated with COVID-19 (2). These developments highlighted the importance of assessing pandemic-related anxiety as a psychologically meaningful phenomenon rather than assuming that it was fully represented by conventional measures of general anxiety.

The intensity of anxiety experienced in response to a health crisis is not determined exclusively by the objective severity of the threat. Individual appraisal processes, coping resources, perceived control, self-efficacy, interpersonal support, resilience, and patterns of emotion regulation may shape whether exposure to the same external stressor results in manageable concern or clinically meaningful distress. Contemporary studies conducted both during and after the COVID-19 period increasingly support a multifactorial understanding of anxiety in which individual psychological resources interact with vulnerability factors. For example, research among young people living in socioeconomically deprived urban environments has demonstrated important relationships among anxiety, depression, resilience, and social capital, suggesting that psychological adaptation depends partly on the personal and social resources available to individuals (3). Likewise, among nursing students, psychological capital and social support have been shown to play mediating roles in the relationship between interpersonal sensitivity and anxiety symptoms (4). Such evidence suggests that identifying modifiable psychological resources may be particularly valuable when examining anxiety within populations exposed to acute or prolonged stress.

One construct that is highly relevant to this perspective is psychological capital. Psychological capital refers to a positive and developable psychological state composed of four interrelated resources: self-efficacy, hope, optimism, and resilience (5). Self-efficacy reflects confidence in one's capacity to mobilize the cognitive, emotional, and behavioral resources required to successfully address difficult tasks and challenging circumstances. Hope involves goal-directed agency together with the perceived ability to generate alternative pathways toward desired outcomes. Optimism reflects a generalized expectation that favorable outcomes can occur, whereas resilience concerns the capacity to withstand, adapt to, and recover from adversity. These dimensions are conceptually distinguishable but collectively represent a broader positive psychological resource that may support adaptive functioning under stressful conditions. Importantly, psychological capital is regarded as state-like and potentially modifiable rather than as a completely fixed personality characteristic, which gives it particular relevance for preventive and therapeutic interventions (5).

Evidence accumulated during the COVID-19 pandemic suggests that psychological capital may protect against anxiety and other forms of psychological distress. Among university students, Jiang found that psychological capital mediated the association between problematic social media use and anxiety during the pandemic, indicating that lower levels of positive psychological resources may constitute one pathway through which stressful behavioral patterns become associated with anxiety (6). Among Chinese medical

students, psychological capital also played a mediating role in the relationship between life satisfaction and symptoms of anxiety and depression, further demonstrating the importance of positive psychological resources in understanding emotional adjustment during COVID-19 (7). Iranian evidence has similarly shown a relationship between psychological capital and coronavirus anxiety, with self-compassion and empathy also contributing to the explanatory model (8). Together, these findings support the proposition that psychological capital may function as a psychological buffer when individuals encounter uncertainty, threat, and disruption.

The individual components of psychological capital may also influence anxiety through partly different psychological mechanisms. Self-efficacy is especially relevant because threatening situations are likely to generate greater anxiety when individuals doubt their ability to manage the demands associated with those situations. During the early stages of the pandemic, perceived self-efficacy was shown to mediate the relationship between perceived threat and psychological anxiety among college students, suggesting that the emotional consequences of threat depend partly on whether individuals believe they possess adequate coping capabilities (9). More recent evidence also demonstrates that regulatory emotional self-efficacy and resilience contribute to the relationship between shyness and social anxiety among college students, indicating that beliefs about one's capacity to manage emotions remain important beyond the specific context of COVID-19 (10). Accordingly, higher self-efficacy may reduce feelings of helplessness, increase perceived control, and facilitate more effective behavioral responses to stressful circumstances.

Hope and optimism may similarly influence responses to prolonged uncertainty. Longitudinal research during the pandemic showed that hope was associated with subsequent changes in COVID-19 stress, anxiety, and well-being, supporting its potential role as a psychological resource during periods of sustained crisis (11). Subsequent research examining trajectories across the pandemic further indicated that hope and optimism were associated with COVID-19 stress, health anxiety, and well-being over time (12). These findings are theoretically meaningful because a pandemic simultaneously threatens individuals' current sense of safety and their expectations regarding the future. Hope may preserve motivation by enabling individuals to identify alternative routes toward valued goals despite disruption, whereas optimism may reduce the tendency to interpret uncertain future events in exclusively negative terms. However, because these psychological capital components are interrelated, their bivariate associations with anxiety may differ from their unique contributions when considered simultaneously in multivariable analyses.

Resilience constitutes another central component of psychological capital and has received substantial attention in research on adaptation to COVID-19. Among Malaysian medical students, psychological resilience and coping strategies were significantly associated with anxiety during the pandemic, suggesting that students' capacity to adapt to adversity was important in determining emotional outcomes under conditions of academic and health-related stress (13). Research among older European adults likewise showed that resilience and optimism played important roles in psychological functioning during the pandemic (14). Although the populations in these studies differ, their findings converge on the broader principle that resilience may reduce psychological vulnerability by promoting recovery, flexibility, and continued functioning when individuals face circumstances that cannot be easily controlled or eliminated.

Assessment of psychological capital also requires culturally appropriate measurement. The Psychological Capital Questionnaire is one of the most frequently employed instruments for assessing self-efficacy, hope,

resilience, and optimism. Evidence regarding the Persian version of the 24-item Psychological Capital Questionnaire has supported its psychometric adequacy in an Iranian context, providing methodological support for its use in Persian-speaking samples (15). This is particularly important because constructs such as optimism, hope, and self-efficacy may be expressed within culturally influenced patterns of social expectation, coping, and perceived control. Therefore, examining psychological capital among Iranian university students using a validated Persian measure can contribute evidence from a sociocultural context that has been comparatively underrepresented in the international literature.

Although positive psychological resources may protect individuals from excessive anxiety, vulnerability may also arise from the ways emotions are cognitively processed and regulated. Emotion regulation broadly refers to the processes by which individuals influence which emotions they experience, when those emotions occur, and how they are experienced and expressed (16). Regulation may involve changes in attention, interpretation, appraisal, behavioral response, or emotional expression. Importantly, emotion regulation should not be conceptualized simply as suppression of negative emotions; rather, it concerns the dynamic management of emotional responses in accordance with situational demands and personal goals. Contemporary models emphasize that regulatory strategies differ in their effects depending on timing, context, flexibility, and the individual's ability to implement them effectively (16).

Within this broader framework, cognitive emotion regulation concerns the thoughts and cognitive strategies individuals employ after encountering negative or stressful events. Some strategies, such as positive reappraisal, positive refocusing, planning, putting events into perspective, and acceptance, are generally classified as relatively adaptive. In contrast, rumination, catastrophizing, self-blame, and blaming others are typically regarded as maladaptive because they can maintain threat-focused attention and prolong emotional distress. During a crisis such as COVID-19, maladaptive regulation may become particularly consequential. Repeatedly focusing on infection, imagining catastrophic health outcomes, blaming oneself for possible exposure, or persistently dwelling on uncontrollable events may amplify rather than reduce perceived threat. Consistent with this interpretation, maladaptive emotion regulation strategies were found to predict increased anxiety during the COVID-19 pandemic in a psychologically vulnerable population (17).

Recent evidence also reinforces the relationship between emotion regulation difficulties and anxiety beyond the immediate context of COVID-19. Zaid et al. demonstrated that the management of sadness was meaningfully associated with symptoms of depression and anxiety, illustrating the broader relevance of emotional regulatory processes to internalizing psychopathology (18). Secgin and Koc further showed that emotion regulation difficulties contribute to the relationship between sensory processing sensitivity and anxiety, alongside anxiety sensitivity, emphasizing the role of deficient regulatory capacity in translating vulnerability into anxious symptoms (19). Similarly, in individuals with anxiety disorders, emotion regulation skills have been examined together with self-compassion and mindfulness as mechanisms connecting early maladaptive schemas to psychological distress (20). These findings suggest that emotion regulation is not merely a transient coping response but a broader psychological process with implications for vulnerability to anxiety across different populations and stress contexts.

Nevertheless, classification of strategies into “adaptive” and “maladaptive” categories should be interpreted cautiously. The effectiveness of a coping or regulatory strategy may depend on the nature of the stressor, perceived controllability, timing, and the availability of alternative responses. Coping flexibility

theory proposes that successful adaptation depends not only on whether an individual uses a particular strategy, but also on the ability to discontinue an ineffective strategy and replace it with another response that better fits changing situational demands (21). This perspective is particularly relevant to COVID-19 because the pandemic involved rapidly changing circumstances in which strategies effective at one stage might have been less useful at another. Consequently, even strategies conventionally regarded as adaptive may not demonstrate strong inverse relationships with anxiety when analyzed without considering context, implementation quality, or flexibility.

Anxiety during a pandemic may therefore be understood as the product of both resource-related and regulation-related processes. Psychological capital concerns whether individuals possess positive beliefs and capacities that enable them to confront difficulty with confidence, persistence, realistic positive expectations, and resilience. Cognitive emotion regulation, by contrast, concerns how individuals mentally process stressful experiences and manage the emotional consequences of those experiences. These domains are related but theoretically distinct. Someone may possess relatively high optimism or hope but still engage in rumination or catastrophizing, whereas another individual may use constructive cognitive strategies despite having weaker confidence in personal coping ability. Examining both domains simultaneously can therefore clarify whether anxiety is more strongly associated with a deficit in positive psychological resources, greater reliance on maladaptive regulatory strategies, or a combination of both.

This simultaneous approach also addresses an important limitation of previous research. Much of the available literature has examined psychological capital, resilience, self-efficacy, hope, optimism, coping, or emotion regulation separately, frequently focusing on mediation between one vulnerability factor and one mental health outcome. Although these studies have substantially advanced understanding of individual mechanisms, fewer investigations have directly compared the relative contributions of multiple components of psychological capital and broader categories of adaptive and maladaptive cognitive emotion regulation within the same predictive model. Such an analysis is particularly useful because shared variance among psychological constructs can produce different patterns at the bivariate and multivariate levels. A variable may correlate strongly with anxiety but make only a small independent contribution once conceptually related predictors are considered simultaneously.

Demographic characteristics may further contribute to differences in anxiety and should not be overlooked. Studies conducted during COVID-19 reported variations in anxiety according to gender and other sociodemographic variables, although findings were not always consistent across cultural contexts (22). Age, educational stage, relationship status, social responsibilities, and exposure to academic disruption may influence perceived threat and available coping resources. For university students, younger age and undergraduate status may coincide with less experience managing prolonged uncertainty and fewer established occupational or economic resources. At the same time, demographic variables are unlikely to fully explain individual differences in anxiety, making it important to evaluate them alongside more proximal and potentially modifiable psychological factors.

Taken together, the existing literature indicates that COVID-19-related anxiety was a multifaceted psychological response influenced not only by exposure to health-related threat but also by positive psychological resources, appraisal processes, resilience, perceived self-efficacy, and emotion regulation patterns. Psychological capital appears relevant to anxiety across student and clinical populations, whereas

maladaptive emotion regulation represents a consistent vulnerability factor. Recent studies further demonstrate that resilience, social capital, regulatory emotional self-efficacy, and emotion regulation difficulties continue to be important correlates of anxiety in the post-pandemic literature (3, 4, 10, 19). Consequently, analyzing psychological capital and emotion regulation together may provide a more integrated explanation of why some students experienced severe anxiety during the COVID-19 crisis while others showed greater psychological adaptation.

Accordingly, the aim of the present study was to simultaneously examine psychological capital and its components—self-efficacy, hope, optimism, and resilience—together with adaptive and maladaptive cognitive emotion regulation strategies as predictors of COVID-19-related anxiety among university students.

Methods and Materials

Study Design and Participants

This descriptive-correlational study was conducted between March and July 2021 among university students in Tehran, Iran. Convenience sampling was used, and data were collected online through Google Forms. The online approach was adopted because of the restrictions and concerns regarding face-to-face contact during the COVID-19 pandemic.

The sample size was determined based on the study objectives and the number of variables examined. According to the guideline proposed by Tabachnick and Fidell (Tabachnick & Fidell, 2013) for multiple regression analysis, the minimum sample size can be estimated using the formula $N \geq 50+8m$ for testing the overall regression model and $N \geq 104+m$ for assessing individual predictors, where m represents the number of predictors. Given the number of predictors examined in the present study, a sample of 309 participants was considered adequate for the planned correlation and multiple regression analyses. Ultimately, 309 university students participated in the study.

The inclusion criteria were being enrolled at a university in Tehran, being an active internet or social media user, and providing informed consent to participate. Participants who did not consent to participate or submitted incomplete questionnaires were excluded from the study. To verify student status, information regarding participants' educational level and academic status was collected at the beginning of the online questionnaire created using Google Forms.

Data were collected online using a questionnaire developed in Google Forms. At the beginning of the questionnaire, participants were provided with a brief explanation of the study, information regarding the confidentiality and anonymity of their responses, and a statement emphasizing the voluntary nature of participation. Participants were asked not to provide their names or any other directly identifying information. The researcher's email address was also provided for participants who wished to make inquiries about the study.

Written informed consent was obtained from all participants before their inclusion in the study. The questionnaire link was then initially distributed to three volunteer students, who were asked to share it within their educational and professional WhatsApp groups. Participants completed the questionnaire voluntarily after providing informed consent. The researcher monitored the number of completed responses, and data collection was discontinued once the predetermined sample size had been reached.

The study was conducted following approval by the Ethics Committee of the Islamic Azad University, Science and Research Branch, Tehran, under ethical approval code IR.IAU.SRB.REC.1399.175, dated February 16, 2021 (26/11/1399). Participants' information was kept confidential, and the data were analyzed only in aggregate form and for research purposes.

Data Collection Tools

COVID-19-related anxiety was assessed using the Corona Disease Anxiety Scale (CDAS) developed by Alipour et al (Alipour et al., 2020). The scale consists of 18 items rated on a four-point response scale ranging from 0 (never) to 3 (always), with total scores ranging from 0 to 54. Higher scores indicate greater COVID-19-related anxiety. Scores of 0–16, 17–29, and 30–54 represent mild or no anxiety, moderate anxiety, and severe anxiety, respectively. The original validation study demonstrated satisfactory psychometric properties, with a Cronbach's alpha coefficient of 0.91 (Alipour et al., 2020) In the present study, the CDAS demonstrated excellent internal consistency, with a Cronbach's alpha of 0.97.

Psychological capital was measured using the Psychological Capital Questionnaire (PCQ) developed by Luthans et al (Luthans et al., 2006). The 24-item questionnaire assesses four components of psychological capital: self-efficacy, hope, resilience, and optimism, with six items assessing each component. Items are rated on a six-point Likert scale ranging from strongly disagree to strongly agree, with higher scores indicating greater psychological capital. Previous research has supported the reliability and validity of the PCQ. In Iran, Mohsenabadi et al (Mohsenabadi et al., 2022) reported satisfactory internal consistency for psychological capital. In the present study, Cronbach's alpha coefficients were 0.84 for self-efficacy, 0.93 for hope, 0.89 for optimism, and 0.86 for resilience.

Cognitive emotion regulation was assessed using the short form of the Cognitive Emotion Regulation Questionnaire (CERQ-Short) developed by Garnefski and Kraaij (Garnefski & Kraaij, 2006). The 18-item questionnaire assesses nine cognitive emotion regulation strategies: self-blame, rumination, catastrophizing, other-blame, acceptance, positive refocusing, refocus on planning, positive reappraisal, and putting into perspective. Each strategy is assessed using two items rated on a five-point scale ranging from 1 (almost never) to 5 (almost always).The nine strategies are commonly grouped into maladaptive and adaptive cognitive emotion regulation dimensions. Maladaptive regulation includes self-blame, rumination, catastrophizing, and other-blame, whereas adaptive regulation includes acceptance, positive refocusing, refocus on planning, positive reappraisal, and putting into perspective. Higher scores indicate greater use of the corresponding strategies.In Iran, Besharat and Bazzazian (Basharat & Bazzazian, 2015) reported satisfactory psychometric properties for the CERQ in an Iranian sample. In the present study, the maladaptive cognitive emotion regulation dimension demonstrated a Cronbach's alpha coefficient of 0.73, and the adaptive dimension showed a Cronbach's alpha of 0.77.

Data Analysis

Data were analyzed using SPSS version 24 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequencies, means, and standard deviations, were used to summarize the study variables and participants' demographic characteristics. Pearson's correlation coefficients were calculated to examine the

associations among the study variables. Multiple linear regression analysis was conducted to identify the variables that predicted COVID-19 anxiety. A p value < .05 was considered statistically significant.

Findings and Results

Tables 1A–1C present the demographic characteristics of the participants, descriptive statistics for the psychological variables, and the distribution of COVID-19-related anxiety severity, respectively. Section A presents the frequencies and percentages of the demographic variables; Section B reports the score range, mean, standard deviation, skewness, kurtosis, and Kolmogorov–Smirnov test results; and Section C presents the frequency and percentage distribution of COVID-19-related anxiety severity.

Table 1A. Frequency Distribution of Participants' Demographic Characteristics

Variable	Level	n	%
Gender	Female	217	70.2
	Male	92	29.8
Marital status	Single	156	50.5
	Married	153	49.5
Age group	< 30 years	183	59.2
	30–40 years	99	32.0
	> 40 years	27	8.7
Education level	Associate's degree	1	0.3
	Bachelor's degree	165	53.4
	Master's degree	130	42.1
	Doctorate	13	4.2

As shown in Table 1A, most participants were female (70.2%). Regarding marital status, 50.5% were single and 49.5% were married. In terms of age, 59.2% of participants were younger than 30 years, 32.0% were aged 30–40 years, and 8.7% were older than 40 years. Regarding educational attainment, the largest proportion of participants held a bachelor's degree (53.4%), followed by a master's degree (42.1%).

Table 1B. Descriptive Statistics and Kolmogorov–Smirnov Normality Test Results for the Psychological Variables

Variable	Min	Max	M	SD	Skewness	Kurtosis	K–S (Z)	Sig.
Psychological capital	56.00	142.00	92.20	20.57	.299	-.187	0.080	<.001
Resilience	8.00	36.00	22.55	7.92	.219	-1.468	.181	<.001
Optimism	12.00	36.00	22.16	5.94	.541	-.995	.185	<.001
Hope	8.00	36.00	25.08	6.91	-.345	-.927	.087	<.001
Self-efficacy	15.00	36.00	22.40	4.28	.704	-.127	.140	<.001
Adaptive strategies	18.00	50.00	33.75	7.16	.041	-.705	.069	.001
Maladaptive strategies	9.00	38.00	24.71	5.99	-.239	-.944	.129	<.001
Covid-19 anxiety	0.00	52.00	31.57	16.01	-.492	-1.391	.198	<.001

Regarding the descriptive indices, skewness values ranged from −0.492 to 0.704, whereas kurtosis values ranged from −1.468 to −0.127. Although the Kolmogorov–Smirnov test was statistically significant for all variables (all $p \leq .001$), the magnitude of deviation from symmetry based on the skewness and kurtosis indices was not substantial. Given the sensitivity of formal normality tests to minor deviations in relatively large samples, statistical significance of the Kolmogorov–Smirnov test alone was not considered sufficient grounds for rejecting the assumption of normality. In the regression analysis, the normality of the model residuals was assessed using a histogram and a P–P plot, with the results presented in the corresponding section on regression analysis.

Table 1C. Frequency Distribution of COVID-19-Related Anxiety Severity Based on Cutoff Scores

Anxiety level	Score range	n	%
Mild	0–16	84	27.2
Moderate	17–29	37	12.0
Severe	30–54	188	60.8
Total	—	309	100.0

As shown in Table 1C, 60.8% of participants had severe COVID-19-related anxiety, 27.2% had mild anxiety, and 12.0% had moderate anxiety. Thus, severe COVID-19-related anxiety was the most prevalent category in the study sample. The negative skewness of COVID-19-related anxiety scores (−0.492) was also consistent with a relative concentration of scores at higher values and a longer tail toward lower scores.

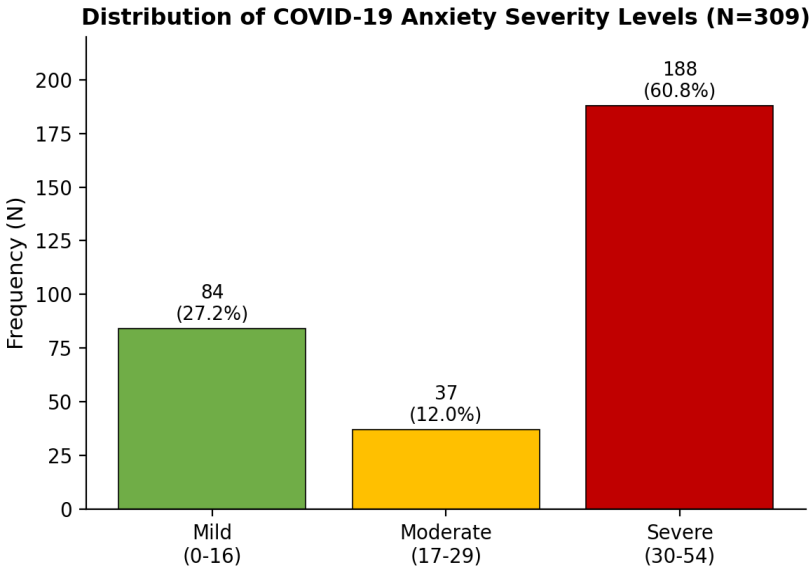


Figure 1. Percentage Distribution of COVID-19-Related Anxiety Severity Levels Based on CDAS Scores. Score ranges: mild = 0–16, moderate = 17–29, severe = 30–54.

As shown in Figure 1, the percentage distribution of anxiety severity levels confirms the pattern described above, with severe anxiety accounting for the largest proportion of the sample.

To examine differences in COVID-19-related anxiety across demographic variables, the assumption of homogeneity of variances was first assessed using Levene's test. The results indicated that this assumption was violated for age group and educational level, whereas no significant violation was observed for gender or marital status. Accordingly, independent-samples *t* tests were used for the two-level variables of gender and marital status. For age group and educational level, the nonparametric Kruskal–Wallis test was used because each variable comprised more than two groups and the assumption of homogeneity of variances was violated. When the Kruskal–Wallis test yielded a significant result, pairwise comparisons were conducted using the Mann–Whitney *U* test, with a Bonferroni correction applied to control the familywise Type I error associated with multiple comparisons. Because three pairwise comparisons were performed for each variable, the adjusted significance level was set at $\alpha = .05/3 = .0167$. Participants with an associate degree ($n = 1$) were excluded from the pairwise comparisons for educational level because of the extremely small subgroup size.

Table 2A. Results of Independent-Samples t Tests and the Kruskal–Wallis Test for Comparing COVID-19-Related Anxiety Across Demographic Variables

Variable	Test type	Test statistic	df	Sig.	Effect size	Interpretation	Direction of difference
Gender	Independent t	t = -0.232	307	0.817	d = -0.03	Negligible	Not significant
Marital status	Independent t	t = -2.161	307	0.031*	d = -0.25	Small	Married > Single
Age group	Kruskal–Wallis	H = 42.817	2	<.001**	$\eta^2 \approx .133$	Medium to large	Overall significant
Education level	Kruskal–Wallis	H = 30.664	3	<.001**	$\eta^2 \approx .091$	Medium	Overall significant

As shown in Table 2, among the four demographic variables examined, gender was the only variable that was not significantly associated with COVID-19-related anxiety, with a negligible effect size (d = –.03).

Marital status was significantly associated with anxiety, although the magnitude of the effect was small (d = −.25). In contrast, age group showed a medium-to-large effect size ($\eta^2 \approx .133$), whereas educational level showed a medium effect size ($\eta^2 \approx .091$).

Table 2B. Post Hoc Pairwise Comparisons of Age Groups and Educational Levels Using the Mann–Whitney U Test with Bonferroni Correction

Pairwise comparison	U	Z	Adjusted p	r	Effect size	Direction of difference
Age group						
< 30 years vs. 30–40 years	7833.00	-1.877	.180[a]	.112	Small	Not significant
< 30 years vs. > 40 years	577.00	-6.432	<.001[a]**	.444	Medium	< 30 > > 40
30–40 years vs. > 40 years	447.50	-5.290	<.001[a]**	.471	Medium	30–40 > > 40
Education level						
Bachelor's vs. Master's	7725.00	-4.129	<.001[a]**	.240	Small	Bachelor's > Master's
Bachelor's vs. Doctorate	282.00	-4.427	<.001[a]**	.332	Medium	Bachelor's > Doctorate
Master's vs. Doctorate	509.00	-2.361	.054[a]	.197	Small	Not significant

The pairwise comparisons showed that, among the age groups, participants younger than 30 years reported higher levels of anxiety than those older than 40 years, and participants aged 30–40 years also reported higher anxiety than those older than 40 years. However, the difference between participants younger than 30 years and those aged 30–40 years was not statistically significant. Regarding educational level, participants with a bachelor's degree reported higher anxiety than those with a master's or doctoral degree; however, the difference between participants with master's and doctoral degrees was not statistically significant after Bonferroni correction.

Table 3. Pearson Correlation Matrix for COVID-19-Related Anxiety, Psychological Capital, Its Components, and Emotion Regulation Strategies

Variable	1	2	3	4	5	6	7	8
1. Anxiety	—	-.54**	-.608**	-.499**	-.137**	-.622**	.240**	.680**
2. Psych. capital		—	.860**	.922**	.719**	.744**	-.018	-.401**
3. Optimism			—	.768**	.373**	.721**	.005	-.449**
4. Resilience				—	.562**	.605**	-.058	-.331**
5. Hope					—	.282**	-.034	-.169**
6. Self-efficacy						—	.068	-.419**
7. Adaptive strategies							—	.486**
8. Maladaptive strategies								—

According to Table 3, psychological capital was significantly and negatively correlated with COVID-19-related anxiety (r = −.540, p < .01). All four components of psychological capital were likewise significantly and negatively correlated with COVID-19-related anxiety, including optimism (r = −.608, p < .01), resilience (r = −.499, p < .01), hope (r = −.137, p < .01), and self-efficacy (r = −.622, p < .01). Among the components of psychological capital, self-efficacy showed the strongest negative correlation with COVID-19-related

anxiety, whereas hope showed the weakest. In contrast, adaptive emotion regulation strategies were significantly and positively correlated with COVID-19-related anxiety ($r = .240$, $p < .01$), while maladaptive strategies showed a stronger positive correlation with anxiety ($r = .680$, $p < .01$). Thus, maladaptive emotion regulation strategies showed the strongest positive correlation with COVID-19-related anxiety in the correlation matrix.

Assessment of the assumptions underlying the regression analysis indicated that they were generally satisfied. The Durbin–Watson statistic (1.431) indicated relative independence of the residuals. The normality of the residuals was assessed using a histogram and P–P plot, homoscedasticity was evaluated using a residual scatterplot, and the absence of severe multicollinearity was supported by tolerance values above 0.28 and VIF values below 3.54. Overall, the primary assumptions of multiple linear regression were adequately met in the present analysis. The regression results are presented in Tables 4–6.

Table 4. Multiple Linear Regression Model Summary for Predicting COVID-19-Related Anxiety Based on the Predictor Variables

Model	R	R^2	Adjusted R^2	SE of the estimate	Durbin–Watson
1	.798	.637	.630	9.744	1.431

Table 5. Analysis of Variance (ANOVA) for the Multiple Regression Model

Source	Sum of squares	df	Mean square	F	Sig.
Regression	50297.93	6	8382.99	88.285	0.000
Residual	28675.96	302	94.95	—	—
Total	78973.89	308	—	—	—

Table 6. Standardized and Unstandardized Regression Coefficients for Predicting COVID-19-Related Anxiety

Predictor variable	B	SE	Beta	t	Sig.	95% CI for B	VIF
Constant	28.474	5.245	—	5.428	.000	18.15–38.80	—
Optimism	-0.361	0.176	-.134	-2.051	.041*	-0.71 to -0.02	3.538
Resilience	-0.328	0.126	-.162	-2.597	.010*	-0.58 to -0.08	3.239
Adaptive strategies	0.072	0.096	.032	.752	.453	-0.12–0.26	1.536
Maladaptive strategies	1.229	0.129	.460	9.528	.000**	0.98–1.48	1.935
Self-efficacy	-1.062	0.196	-.284	-5.405	.000**	-1.45 to -0.68	2.292
Hope	0.377	0.098	.163	3.849	.000**	0.18–0.57	1.484

As shown in Table 4, the regression model including six predictor variables explained 63.7% of the variance in COVID-19-related anxiety ($R^2 = .637$; adjusted $R^2 = .630$). As reported in Table 5, the overall regression model was statistically significant, $F(6, 302) = 88.285$, $p < .001$. According to Table 6, five of the six predictors made significant contributions to the prediction of COVID-19-related anxiety. Maladaptive strategies had the largest positive standardized coefficient ($\beta = .460$, $p < .001$). Among the components of psychological capital, self-efficacy showed the largest negative standardized coefficient ($\beta = -.284$, $p < .001$), followed by resilience ($\beta = -.162$, $p = .010$) and optimism ($\beta = -.134$, $p = .041$). Hope also made a significant

positive contribution to the model after simultaneously controlling for the other predictors (β = .163, p < .001). In contrast, adaptive strategies did not make a statistically significant contribution to the prediction of COVID-19-related anxiety (β = .032, p = .453).

Discussion and Conclusion

The present study examined the simultaneous contributions of psychological capital and cognitive emotion regulation strategies to COVID-19-related anxiety among university students. The findings revealed a substantial psychological burden in the study population, with 60.8% of participants classified as having severe COVID-19-related anxiety. Demographic analyses further showed that gender was not significantly associated with anxiety, whereas marital status was significantly associated with anxiety with a small effect size. Age and educational level demonstrated more pronounced differences: students younger than 30 years and those aged 30–40 years reported greater anxiety than participants older than 40 years, while students at the bachelor's level reported greater anxiety than those enrolled in master's and doctoral programs. At the correlational level, total psychological capital and all four of its components were inversely associated with COVID-19-related anxiety, whereas both adaptive and maladaptive emotion regulation strategies showed positive correlations with anxiety, with the latter relationship being markedly stronger. Most importantly, the multiple regression model explained 63.7% of the variance in COVID-19-related anxiety. Maladaptive emotion regulation strategies emerged as the strongest positive predictor (β = .460), whereas self-efficacy was the strongest negative predictor (β = −.284). Resilience (β = −.162) and optimism (β = −.134) also independently predicted lower anxiety, while hope unexpectedly showed a positive coefficient (β = .163) after the simultaneous inclusion of other predictors. Adaptive emotion regulation strategies did not independently predict anxiety in the final model. These findings collectively indicate that vulnerability to COVID-19-related anxiety was associated not only with demographic characteristics but, more importantly, with the balance between positive psychological resources and maladaptive cognitive-emotional processes.

The high prevalence of severe anxiety observed in the present sample is understandable in the context of the extraordinary uncertainty that characterized the COVID-19 pandemic. COVID-19 anxiety involved not only concern about infection but also fear of adverse health outcomes, transmission to family members, interruption of education, social isolation, and uncertainty regarding future academic and occupational plans. Measures specifically designed to assess coronavirus-related anxiety have demonstrated that the pandemic produced a distinct pattern of psychological and somatic anxiety symptoms (1, 2). Previous studies similarly documented substantial anxiety during the pandemic among university students and the general population (7, 13, 22). Students may have been especially vulnerable because the pandemic disrupted educational routines while simultaneously reducing ordinary social and institutional sources of support. Thus, the high level of anxiety observed in this study should be interpreted within a historical context characterized by prolonged uncertainty, perceived threat, and limited control over rapidly changing conditions.

Regarding demographic variables, the absence of a significant gender difference contrasts with some studies reporting greater anxiety among women during COVID-19. For example, Özdin and Bayrak Özdin identified gender as an important correlate of anxiety, depression, and health anxiety during the pandemic (22). Nevertheless, gender differences are not necessarily consistent across samples, and the present finding

suggests that pandemic-specific threat may have affected male and female students relatively similarly in this population. Differences in cultural context, sample composition, instruments, exposure to pandemic-related stressors, and the proportion of women and men included in the analysis may partly account for discrepant results. Moreover, because the present study assessed anxiety specifically related to COVID-19 rather than generalized anxiety, conventional gender patterns in internalizing symptoms may not necessarily be reproduced.

Married participants reported significantly higher anxiety than single participants, although the small effect size indicates that marital status alone was not a major determinant of COVID-19-related anxiety. One interpretation is that married students may have experienced additional concerns regarding infection transmission to spouses, children, or other household members. The pandemic transformed health-related anxiety from an individual concern into a relational concern in which one's own exposure potentially endangered close others. However, because the effect was small, marital status should not be interpreted as a strong independent risk factor. Rather, it may represent one contextual characteristic whose relevance depends on the psychological and social resources available to the individual. The broader literature suggests that anxiety during crises is more adequately understood through interaction among situational demands, social resources, resilience, and psychological capital than through demographic variables alone (3, 4).

The significantly greater anxiety observed among younger students and those enrolled at the undergraduate level is also noteworthy. Younger students may possess less experience managing severe health crises and may have fewer established economic, occupational, and interpersonal resources. Undergraduate students may also experience greater uncertainty regarding academic progression and future employment. In contrast, older and postgraduate students may have developed more stable coping patterns, greater confidence in managing stress, or stronger academic and professional identities. The importance of resilience and coping among students during the pandemic has been demonstrated previously, particularly among medical students exposed to considerable academic and health-related pressures (13). More generally, evidence that resilience and social capital are negatively associated with anxiety in young people supports the proposition that access to personal and contextual resources may partly explain why some younger individuals are particularly vulnerable to psychological distress (3). These interpretations should nevertheless remain cautious because the present design did not directly test the mechanisms underlying age- and education-related differences.

The most prominent finding of the study was the strong positive predictive effect of maladaptive emotion regulation strategies on COVID-19-related anxiety. This finding is consistent with the theoretical proposition that the regulation of emotional responses is central to adaptation under stress. Emotion regulation involves the processes through which individuals influence the occurrence, intensity, duration, and expression of emotional states (16). When individuals rely heavily on strategies such as rumination, catastrophizing, self-blame, or blaming others, negative emotional experiences may be maintained or amplified rather than effectively processed. Under pandemic conditions, catastrophizing may increase the perceived probability or severity of infection-related outcomes, while rumination may repeatedly redirect attention toward threatening information. Self-blame may additionally produce guilt regarding perceived failures to avoid exposure or protect family members. Consistent with the present results, maladaptive emotion regulation strategies have previously been identified as predictors of increased anxiety during the COVID-19 pandemic

(17). More recent evidence also confirms that emotion regulation difficulties remain strongly implicated in anxiety beyond the pandemic context (18-20).

The magnitude of the coefficient for maladaptive strategies is particularly important because these strategies remained the strongest positive predictor even after psychological capital components were entered simultaneously. This suggests that the manner in which individuals cognitively processed pandemic-related stress may have had a more direct association with anxiety than merely possessing lower levels of positive psychological resources. Persistent rumination and catastrophic interpretation can maintain physiological and cognitive arousal, making it difficult for the individual to disengage from perceived threat. Consequently, even individuals with some degree of hope, resilience, or optimism may remain vulnerable if they repeatedly employ maladaptive cognitive strategies. This finding is compatible with Gross's conceptualization of emotion regulation as a dynamic process with major implications for psychological adjustment (16). It also supports findings showing that difficulties in managing emotional experiences constitute an important pathway toward anxiety symptoms (19).

In contrast, adaptive emotion regulation strategies were positively correlated with anxiety at the bivariate level but did not significantly predict anxiety in the multivariable model. This pattern suggests that the simple correlation between adaptive strategies and anxiety may have reflected shared variance with other emotion regulation processes rather than a unique harmful effect of adaptive strategies. Individuals experiencing greater anxiety may actively attempt to use more adaptive strategies, such as positive reappraisal, acceptance, or planning, precisely because they are experiencing greater distress. Thus, frequency of strategy use should not automatically be interpreted as evidence of successful regulation. The effectiveness of regulation may depend on whether a strategy is appropriate for the situation, implemented skillfully, and changed when it proves ineffective. This interpretation is consistent with Kato's coping flexibility hypothesis, which emphasizes the capacity to discontinue ineffective coping and employ alternative strategies rather than assuming that any single strategy is universally adaptive (21). The pandemic constituted a rapidly changing and only partially controllable stressor, and therefore the effectiveness of adaptive cognitive strategies may have depended strongly on situational fit.

Among psychological capital dimensions, self-efficacy showed the strongest negative relationship with COVID-19-related anxiety in the regression model. This is theoretically plausible because self-efficacy reflects individuals' beliefs regarding their capacity to manage demands, overcome obstacles, and effectively respond to challenging circumstances. During a pandemic, individuals with higher self-efficacy may perceive themselves as more capable of following preventive measures, accessing information, managing educational disruption, and coping with uncertainty. Such perceptions can reduce helplessness and increase perceived control. Zhang et al. similarly reported that self-efficacy mediated the relationship between perceived threat and psychological anxiety among college students during the early stage of COVID-19, indicating that perceptions of coping capability substantially influence emotional responses to threat (9). The importance of regulatory emotional self-efficacy is also evident in more recent research demonstrating its mediating role in the relationship between shyness and social anxiety among college students (10). Taken together, these findings suggest that anxiety depends not solely on how threatening an event appears but also on whether the individual believes that the event and its emotional consequences can be managed effectively.

Resilience also emerged as a significant negative predictor. This result is consistent with evidence showing that resilience contributes to lower anxiety and more effective coping during stressful circumstances. Among medical students during COVID-19, resilience and coping strategies were associated with anxiety levels (13). Lee likewise demonstrated the relevance of resilience and optimism to adaptation during the pandemic among older European adults (14). Resilience may reduce anxiety by supporting recovery following stressful events, maintaining behavioral functioning despite adversity, and allowing individuals to adapt to changing circumstances. It may also facilitate greater persistence and flexibility when previously effective coping strategies become unavailable. Findings from non-pandemic settings similarly indicate that resilience and social resources are associated with lower anxiety among vulnerable young populations (3). Accordingly, the negative contribution of resilience observed here fits a broader literature identifying resilience as a protective psychological capacity.

Optimism also independently predicted lower COVID-19-related anxiety. Optimistic individuals may be less inclined to interpret uncertain events as inevitably leading to negative outcomes and may maintain more favorable expectations regarding recovery, treatment, and the eventual resolution of a crisis. Long et al. demonstrated that hope and optimism were related to trajectories of COVID-19 stress, health anxiety, and well-being over the course of the pandemic (12). Optimism may therefore protect against anxiety by reducing persistent negative forecasting and supporting continued engagement with future goals. However, the comparatively smaller standardized effect of optimism in the present multivariable model suggests that some of its protective association may overlap with other psychological capital components. This is conceptually consistent with psychological capital theory, in which efficacy, hope, resilience, and optimism are understood as interrelated positive psychological resources rather than fully independent constructs (5).

An especially interesting finding concerned hope. At the bivariate level, hope showed a weak negative correlation with COVID-19-related anxiety, whereas in the regression model its coefficient became significantly positive after the effects of optimism, resilience, self-efficacy, and emotion regulation strategies were simultaneously controlled. The negative zero-order relationship is consistent with longitudinal evidence showing beneficial associations between hope and COVID-19 stress, anxiety, and well-being (11, 12). The reversal of direction in the regression model therefore should not be interpreted as evidence that hope is intrinsically harmful. Rather, the pattern is compatible with a suppression or shared-variance effect. Because hope overlaps conceptually and statistically with other psychological capital components, controlling for self-efficacy, optimism, and resilience may isolate a residual portion of hope that differs from the broader protective construct measured at the bivariate level. The strong interrelations among components of psychological capital make such coefficient changes plausible (5). Accordingly, the zero-order negative correlation and the multivariable positive coefficient should be considered jointly rather than treating the latter as evidence that greater hope increases anxiety.

The overall explanatory power of the regression model further emphasizes the combined importance of psychological capital and emotion regulation. Explaining 63.7% of the variance in COVID-19-related anxiety indicates that these psychological constructs captured a substantial portion of individual differences in anxiety within this sample. Previous research has similarly demonstrated that psychological capital can mediate associations between potentially stressful experiences and anxiety. Psychological capital mediated the relationship between problematic social media use and anxiety among university students during

COVID-19 (6), and it also mediated the association between life satisfaction and anxiety and depressive symptoms among medical students (7). In Iranian research, psychological capital has likewise been associated with coronavirus anxiety in models involving self-compassion and empathy (8). Evidence from nursing students further indicates that psychological capital can mediate the relationship between interpersonal sensitivity and anxiety symptoms (4). The present findings extend this literature by demonstrating that psychological capital components retain meaningful associations when maladaptive and adaptive emotion regulation strategies are considered simultaneously.

Taken together, the findings support an integrated interpretation of COVID-19-related anxiety in which emotional vulnerability reflects both the presence of maladaptive regulatory processes and the relative availability of positive psychological resources. Psychological capital may provide individuals with confidence, future orientation, adaptability, and positive expectations, whereas maladaptive cognitive emotion regulation may repeatedly reinforce threat and distress. Importantly, these processes need not operate independently. Poor emotion regulation can undermine the effective use of psychological resources, while stronger self-efficacy and resilience may facilitate more flexible responses to distress. Contemporary evidence showing relationships between emotional regulation, resilience, regulatory self-efficacy, psychological capital, and anxiety across various populations supports such an integrated perspective (4, 10, 18, 19). Although the acute phase of COVID-19 has ended, understanding these relationships remains relevant for future public health emergencies, natural disasters, and other large-scale crises requiring prolonged adaptation under conditions of uncertainty.

The findings should be interpreted in light of several limitations. First, the cross-sectional and correlational design does not permit conclusions regarding temporal precedence or causality; therefore, psychological capital and emotion regulation strategies can be described as predictors in a statistical sense but not as demonstrated causes of COVID-19-related anxiety. Second, all variables were assessed through self-report questionnaires, increasing the possibility of common-method variance, recall bias, and socially desirable responding. Third, convenience sampling and online recruitment may have produced selection bias because students with greater internet engagement or particular levels of psychological distress may have been more likely to participate. Fourth, women constituted a substantial majority of the sample, which may limit the generalizability of the findings across gender groups. Fifth, participants were university students from Tehran, and the results may not generalize to students in other regions, nonstudent populations, or populations with different socioeconomic and cultural characteristics. Finally, variables such as previous psychiatric history, exposure to COVID-19 infection, bereavement, socioeconomic stress, social support, academic disruption, and severity of pandemic restrictions were not included and may have influenced anxiety levels.

Future studies should employ longitudinal designs to determine whether psychological capital and emotion regulation prospectively predict changes in anxiety across different stages of a crisis. Repeated assessments could clarify whether self-efficacy, resilience, optimism, and hope remain stable protective resources or vary according to changes in external threat. Experimental and intervention studies are also required to determine whether strengthening psychological capital or reducing maladaptive emotion regulation produces measurable reductions in anxiety. Future research should recruit larger and more representative samples from multiple universities and geographical regions and should achieve greater

balance in gender and educational level. Investigating psychological capital as a higher-order construct alongside its individual components may also clarify the unexpected positive regression coefficient for hope and distinguish suppression effects from substantive associations. Structural equation modeling could be used to examine direct, indirect, and reciprocal relationships among psychological capital, emotion regulation, social support, perceived threat, and anxiety. Finally, future studies should examine emotion regulation flexibility and strategy–situation fit rather than relying solely on fixed classifications of strategies as adaptive or maladaptive.

University counseling centers and mental health services should incorporate psychological capital and emotion regulation into crisis-preparedness programs. Interventions may be particularly useful when they focus on reducing rumination, catastrophizing, self-blame, and other maladaptive cognitive patterns while simultaneously strengthening self-efficacy, resilience, and realistic optimism. Because younger and undergraduate students showed higher anxiety, preventive screening and early psychological support could prioritize these groups during large-scale health or social crises. Programs should move beyond simply teaching a list of supposedly adaptive coping strategies and instead train students to evaluate whether a strategy is effective in a given situation and to shift strategies when necessary. Psychoeducational workshops, brief cognitive-behavioral interventions, resilience training, problem-solving exercises, and self-efficacy enhancement could be integrated into university mental health services. Developing these capacities before the occurrence of future crises may improve students' preparedness, reduce psychological vulnerability, and support more effective adaptation when prolonged uncertainty and uncontrollable stressors arise.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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References

1. Alipour A, Ghadami A, Farsham A, Dorri N. A New Self-Reported Assessment Measure for COVID-19 Anxiety Scale (CDAS) in Iran: A Web-Based Study. Iranian Journal of Public Health. 2020;49(7):1316. doi: 10.18502/ijph.v49i7.3585.
2. Lee SA. Coronavirus Anxiety Scale: A Brief Mental Health Screener for COVID-19 Related Anxiety. Death Studies. 2020;44(7):393-401. doi: 10.1080/07481187.2020.1748481.
3. Martinez JCC, Diez-Canseco F, Brusco LI, Malagón NR, Fung C, Cepeda-Gil M, et al. Depression, Anxiety, and Comorbid Anxiety-Depression and Their Relationship to Social Capital and Resilience in Young People from Deprived Urban Areas: A Cross-Sectional Study in South America. Revista Colombiana de Psiquiatría. 2025.
4. Mi Y, Wang Z, Peng L, Zhang C, Xu H. Exploring the Impact of Interpersonal Sensitivity on Anxiety Symptoms: The Mediating Role of Psychological Capital and Social Support Among Nursing Students. BMC Psychology. 2025;13(1). doi: 10.1186/s40359-025-02621-3.
5. Luthans F, Youssef-Morgan CM. Psychological Capital: An Evidence-Based Positive Approach. Annual Review of Organizational Psychology and Organizational Behavior. 2017;4:339-66. doi: 10.1146/annurev-orgpsych-032516-113324.
6. Jiang Y. Problematic Social Media Usage and Anxiety Among University Students During the COVID-19 Pandemic: The Mediating Role of Psychological Capital and the Moderating Role of Academic Burnout. Frontiers in Psychology. 2021;12:612007. doi: 10.3389/fpsyg.2021.612007.
7. Wang S, Li H, Chen X, Yan N, Wen D. The Mediating Role of Psychological Capital in the Association Between Life Satisfaction and Depressive and Anxiety Symptoms Among Chinese Medical Students During the COVID-19 Pandemic: A Cross-Sectional Study. BMC Psychiatry. 2023;23(1):398. doi: 10.1186/s12888-023-04894-7.
8. Garavand H. Causal Relationship Between Self-Compassion and Psychological Capital with Corona Anxiety: Mediating Role of Empathy. Iranian Journal of Health Psychology. 2022;5(4):19-34. doi: 10.30473/ijohp.2023.62163.1222.
9. Zhang W, Xiong S, Zheng Y, Wu J. Response Efficacy and Self-Efficacy Mediated the Relationship Between Perceived Threat and Psychic Anxiety Among College Students in the Early Stage of the COVID-19 Pandemic. International Journal of Environmental Research and Public Health. 2022;19(5):2832. doi: 10.3390/ijerph19052832.
10. Wang Y, Zhao Y. The Impact of Shyness on Social Anxiety among College Students: Mediating Role of Regulatory Emotional Self-Efficacy and Resilience. PLOS ONE. 2026;21(3):e0344809. doi: 10.1371/journal.pone.0344809.
11. Gallagher MW, Smith LJ, Richardson AL, D'Souza JM, Long LJ. Examining the Longitudinal Effects and Potential Mechanisms of Hope on COVID-19 Stress, Anxiety, and Well-Being. Cognitive Behaviour Therapy. 2021;50(3):234-45. doi: 10.1080/16506073.2021.1877341.
12. Long LJ, Viana AG, Zvolensky MJ, Lu Q, Gallagher MW. The Influence of Hope and Optimism on Trajectories of COVID-19 Stress, Health Anxiety, and Wellbeing During the COVID-19 Pandemic. Journal of Clinical Psychology. 2024;80(12):2387-404. doi: 10.1002/jclp.23746.
13. Teh BLS, Ang JK, Koh EBY, Pang NTP. Psychological Resilience and Coping Strategies with Anxiety Among Malaysian Medical Students During the COVID-19 Pandemic. International Journal of Environmental Research and Public Health. 2023;20(3):1894. doi: 10.3390/ijerph20031894.
14. Lee S. Exploring the Role of Resilience and Optimism During the COVID-19 Pandemic in Older European Adults. Research on Aging. 2023;45(9-10):643-53. doi: 10.1177/01640275231152570.
15. Mohsenabadi H, Fathi-Ashtiani A, Ahmadizadeh MJ. Psychometric Properties of the Persian Version of the Psychological Capital Questionnaire-24 (PCQ-24) in a Military Unit. Journal of Military Medicine. 2022;23(9):738-49. doi: 10.30491/JMM.23.9.738.
16. Gross JJ. Emotion Regulation: Current Status and Future Prospects. Psychological Inquiry. 2015;26(1):1-26. doi: 10.1080/1047840X.2014.940781.
17. Brehl AK, Schene A, Kohn N, Fernández G. Maladaptive Emotion Regulation Strategies in a Vulnerable Population Predict Increased Anxiety During the COVID-19 Pandemic: A Pseudo-Prospective Study. Journal of Affective Disorders Reports. 2021;4:100113. doi: 10.1016/j.jadr.2021.100113.
18. Zaid SM, Hutagalung FD, Abd Hamid HSB, Taresh SM. The Power of Emotion Regulation: How Managing Sadness Influences Depression and Anxiety? BMC Psychology. 2025;13(1):38-49. doi: 10.1186/s40359-025-02354-3.
19. Secgin P, Koc V. The Role of Anxiety Sensitivity and Emotion Regulation Difficulties in the Relationship Between Sensory Processing Sensitivity and Anxiety. European Journal of Mental Health. 2026;21:1-13. doi: 10.5708/EJMH.21.2026.0052.

20. Zamani Nezami A, Noforasti A, Farahani H. Early Maladaptive Schemas and Psychological Distress in Individuals with Anxiety Disorders: The Mediating Role of Self-Compassion, Mindfulness, and Emotion Regulation Skills. Applied Psychological Research. 2026;17(1):129-46.
21. Kato T. Examination of the Coping Flexibility Hypothesis Using the Coping Flexibility Scale-Revised. Frontiers in Psychology. 2020;11:561731. doi: 10.3389/fpsyg.2020.561731.
22. Özdin S, Bayrak Özdin Ş. Levels and Predictors of Anxiety, Depression and Health Anxiety During COVID-19 Pandemic in Turkish Society: The Importance of Gender. International Journal of Social Psychiatry. 2020;66(5):504-11. doi: 10.1177/0020764020927051.