Evaluating the Mediating Role of Cognitive Emotion Regulation in the Relationship Between Psychological Capital and Attachment Styles With Risky Behaviors in Lower Secondary School Girls

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Article Info	A B S T R A C T
Article type: *Original Research* **How to cite this article:** 	**Purpose:** The present study aimed to determine the relationship between risky behaviors based on psychological capital and attachment styles, with the mediating role of cognitive emotion regulation in lower secondary school girls. **Methods and Materials:** This research is applied in terms of purpose and descriptive-correlational in terms of data collection. The statistical population included all female students studying in lower secondary schools in Tehran during the academic year 2023–2024. A total of 385 participants were selected using a multistage cluster random sampling method. The study employed the Risky Behaviors Questionnaire by Zadehmohammadi et al. (2008), the Psychological Capital Questionnaire by Luthans et al. (2007), the Attachment Styles Questionnaire by Hazan and Shaver (1987), and the Cognitive Emotion Regulation Questionnaire by Garnefski et al. (2001). Data were analyzed using Pearson correlation and structural equation modeling (SEM) through SPSS v27 and LISREL v8.8. **Findings:** The findings revealed that psychological capital, secure attachment style, and positive cognitive emotion regulation had a significant negative direct effect on risky behaviors. In contrast, avoidant insecure attachment style and negative cognitive emotion regulation had a significant positive direct effect on risky behaviors. The results for the indirect effects showed that the relationship between psychological capital and attachment styles with risky behaviors was significantly mediated by cognitive emotion regulation (P < .05). **Conclusion:** Based on the findings, understanding the elements that may influence adolescents' propensity toward risky behaviors is crucial for designing effective intervention strategies to prevent such behaviors. ***Keywords:*** *Cognitive Emotion Regulation, Psychological Capital, Attachment Styles, Risky Behaviors*

1.　Introduction

Adolescence is a critical developmental stage marked by rapid biological, emotional, and cognitive changes, often accompanied by increased vulnerability to high-risk behaviors. These behaviors—ranging from substance use and unsafe sexual activity to aggressive conduct and emotional dysregulation—pose significant threats to adolescents' physical and psychological well-being, particularly among girls who face unique developmental, societal, and relational challenges (Krug et al., 2020; Wilkins et al., 2023). Understanding the psychosocial and cognitive mechanisms that underpin adolescents' engagement in such behaviors has become an urgent global concern for public health and psychological science alike.

High-risk behaviors in adolescents are multifactorial and are influenced by a constellation of intrapersonal and interpersonal variables, including psychological capital, attachment styles, and cognitive emotion regulation (Ballabrera et al., 2023; Enayati et al., 2025). Psychological capital—a construct comprising hope, resilience, optimism, and self-efficacy—has emerged as a protective factor that fosters adaptive coping and buffers against behavioral and emotional problems (Blasco-Giner et al., 2023; Gavanji et al., 2024; Jia et al., 2021). Adolescents with higher levels of psychological capital exhibit greater resistance to negative environmental influences and are better equipped to regulate their emotions in the face of stress and adversity (Bi & Jin, 2021; Xue et al., 2022).

Recent empirical evidence highlights the significant inverse relationship between psychological capital and risky behaviors in adolescents (Barahoyi et al., 2023; Singh, 2023; Zeng & Wei, 2023). Psychological capital promotes emotional resilience and constructive behavioral choices by enhancing self-regulatory capacity, particularly in contexts of emotional arousal or peer pressure (Fathi et al., 2024; Wang et al., 2021). Moreover, studies have shown that adolescents with higher self-efficacy and optimism are less likely to resort to risk behaviors as maladaptive coping mechanisms (Cannon & Rucker, 2022; Kumar et al., 2022). This protective influence is further reinforced by positive parenting practices and supportive school environments, which amplify the benefits of psychological capital (Paquette et al., 2023; Wilkins et al., 2023).

Attachment theory offers another explanatory lens through which adolescent risk-taking can be understood. Secure attachment relationships with caregivers are foundational to emotional regulation and social competence, while insecure attachments—particularly avoidant and ambivalent styles—are linked to deficits in affect regulation and heightened susceptibility to externalizing behaviors (Butakor et al., 2021; Cavicchioli et al., 2023; Kim, 2020). Securely attached adolescents are more likely to perceive social relationships as sources of support, facilitating adaptive responses to interpersonal stressors and reducing engagement in high-risk behaviors (Lawrence et al., 2023; Owino et al., 2021). Conversely, adolescents with insecure attachment patterns may engage in risk-taking as a means of coping with emotional insecurity, social rejection, or unmet relational needs (Chokan Sonbol et al., 2023; Saint-Eloi Cadely et al., 2020).

The influence of attachment on adolescent behavior is not merely direct; it is intricately mediated by emotion regulation processes. Emotion regulation—the capacity to monitor, evaluate, and modulate emotional reactions—is critical in adolescence, a period characterized by increased emotional reactivity and stress sensitivity (Cummings et al., 2023; Guetta et al., 2022). Adolescents who lack effective cognitive emotion regulation strategies are more likely to act impulsively, exhibit aggression, or turn to harmful coping mechanisms, such as substance use or risky sexual behavior (Fischer et al., 2022; Francesconi et al., 2023). On the other hand, those who employ adaptive strategies, such as reappraisal and problem-solving, demonstrate lower levels of psychopathology and behavioral maladjustment (Sefidrood & Hobbi, 2023; Yousefi et al., 2023).

Cognitive emotion regulation serves as a central mediating mechanism in the relationship between both psychological capital and attachment styles with high-risk behaviors. Adolescents with higher psychological capital are more likely to employ positive cognitive regulation strategies, which mitigate the emotional impulsivity that often precedes risk-taking (Wang et al., 2021; Zeng & Wei, 2023). Similarly, securely attached individuals are more adept at recognizing and managing their emotions, while insecurely attached adolescents often struggle with maladaptive strategies such as rumination, suppression, or catastrophizing, which in turn exacerbate behavioral risk (Mohammadi Hosseini Asl et al., 2022; Noroozi & Janjani, 2023).

In this context, the interplay of psychological capital, attachment styles, and emotion regulation is of critical relevance in adolescent risk prevention frameworks. Despite the growing body of literature supporting these relationships individually, comprehensive models that incorporate these

variables simultaneously remain limited, especially in Middle Eastern contexts, where sociocultural dynamics uniquely shape adolescent development and gender-specific vulnerabilities (Miranda et al., 2021; Porzoor & Hajipour, 2023). Furthermore, while many prior studies have focused on male populations or mixed-gender samples, research on adolescent girls—a group often underrepresented despite being disproportionately affected by certain types of high-risk behaviors—warrants focused attention (Mohammadzadeh et al., 2020; Saladino et al., 2024).

The present study seeks to address these gaps by evaluating the mediating role of cognitive emotion regulation in the relationship between psychological capital and attachment styles with high-risk behaviors in female adolescents.

2. Methods and Materials

2.1. Study Design and Participants

This study is applied in terms of objective and descriptive-correlational in terms of data collection method. The statistical population consisted of female students enrolled in lower secondary schools in Tehran during the 2023–2024 academic year. Researchers suggest that a minimum sample size of 200 is required for structural equation modeling. Considering potential attrition, a sample size of 396 was determined for this study. After removing outliers, data from 385 female students were analyzed. The sampling method was multi-stage cluster random sampling. The inclusion criteria were being within the age range of 12 to 16 years and willingness to participate in the study. Exclusion criteria included having an observable psychological disorder based on the researcher's observation and school health records, and lack of consent to participate in the study.

After obtaining the necessary approvals, the researchers contacted the Tehran Department of Education. One educational district was randomly selected, from which six girls' lower secondary schools were randomly chosen. Within each school, three classes were selected, and from each class, 22 students were chosen, totaling 396 participants.

2.2. Measures

Youth Risk Behaviors Scale (YRBS): This questionnaire was developed and validated by Zadehmohammadi, HamdAbadi, and Heydari (2008). It consists of 38 items measuring adolescents' vulnerability to seven categories of risky behaviors, including violence, smoking, drug use, alcohol consumption, dangerous driving, sexual behavior, and opposite-gender relations. Responses are rated on a 5-point Likert scale ranging from "Strongly Agree" (5) to "Strongly Disagree" (1), yielding a total score between 38 and 190. Higher scores indicate greater risk-proneness. Zadehmohammadi et al. (2008) reported that exploratory factor analysis with principal components explained 64.84% of the variance. Cronbach's alpha was .94 for the total scale, and between .74 to .93 for its subscales (Zadeh Mohammadi et al., 2011). Enayati et al. (2025) reported a total scale reliability of .87 using Cronbach's alpha (Enayati et al., 2025). In the present study, the Cronbach's alpha for the full scale was .89.

Psychological Capital Questionnaire (PCQ): Developed by Luthans et al. (2007), this instrument comprises 24 items across four subscales: self-efficacy, hope, resilience, and optimism. Responses are scored on a 6-point Likert scale from "Strongly Disagree" (1) to "Strongly Agree" (6), with a total possible score ranging from 24 to 144. The original developers reported a Cronbach's alpha of .80 for the overall scale and between .72 and .85 for the subscales (Luthans et al., 2007). Construct validity was supported by a chi-square value of 24.6 and model fit indices of CFI = .97 and RMSEA = .08. Confirmatory factor analysis confirmed the intended factor structure (Bahadori Khosroshah et al., 2012). Several studies have validated this tool's psychometric properties in Iran, with Cronbach's alpha values above .73 (Moradimoghadam & Delavarpour, 2023). Gavanji et al. (2024) reported a reliability of .88 (Gavanji et al., 2024). In this study, the overall Cronbach's alpha was .89.

Attachment Styles Questionnaire: Originally developed by Hazan and Shaver (1987), this self-report measure contains 21 items based on Ainsworth's three attachment styles: secure, avoidant-insecure, and ambivalent-insecure. It uses a 5-point Likert scale (1 = Not at all, 5 = Very much). Higher scores reflect stronger endorsement of a given attachment style. Hazan and Shaver (1987) reported test–retest reliability of .81 and Cronbach's alpha of .78 (Hazan & Shaver, 1987). In Iran, test–retest reliability coefficients for a sample of 300 participants over a four-week interval were .87, .83, and .84 for secure, avoidant, and ambivalent styles among women, and .88, .83, and .83 among men, respectively. Content validity was evaluated by 15 psychology experts using Kendall's coefficient of concordance, yielding .80, .61, and .57 for secure, avoidant, and ambivalent styles (Besharat, 2003). In the study by

Hasantehrani and Moharami (2024), Cronbach's alpha values for secure, avoidant-insecure, and ambivalent-insecure styles were .87, .85, and .89, respectively (Hasantehrani & Moharami, 2024). In the present study, these values were .77, .79, and .80, respectively.

Cognitive Emotion Regulation Questionnaire (CERQ): Developed by Garnefski et al. (2001), this multidimensional self-report tool consists of 36 items and has versions for both adults and children. It assesses two dimensions: positive and negative cognitive emotion regulation strategies. Items are rated on a 5-point Likert scale: (1) Never, (2) Rarely, (3) Sometimes, (4) Often, and (5) Always. Garnefski et al. (2001) reported Cronbach's alpha coefficients ranging from .71 to .81 and content validity coefficients (Kendall's agreement) between .73 and .87 across subscales (Garnefski et al., 2001). The Persian version was validated by Samani and Sadeghi (2010) (Samani & Sadeghi, 2010). In a study by Yousefi et al. (2023), Cronbach's alpha was .77 for positive strategies and .81 for negative strategies (Yousefi et al., 2023). In the present study, these values were replicated: .77 for positive and .81 for negative strategies.

2.3.   Data Analysis

To test the structural model of the hypothesized relationships, the two-step approach of Anderson and Gerbing (1988) was applied. First, the reliability and validity of the questionnaires were confirmed via confirmatory factor analysis (CFA). Then, the proposed structural model was assessed using structural equation modeling (SEM). This approach emphasizes the need to confirm instrument validity and the relationships between observed and latent variables through CFA prior to evaluating structural relationships. In this study, psychological capital and attachment styles were treated as latent exogenous variables, cognitive emotion regulation as the mediating variable, and risky behaviors as the latent endogenous variable. Data analysis involved Pearson correlation and SEM, using SPSS v27 and LISREL v8.8. Sobel's test was used to examine indirect effects, and the Variance Accounted For (VAF) index was applied to determine the strength of mediation effects.

3.   Findings and Results

A total of 385 female students participated in this study, with a mean age of 14.26 years and a standard deviation of 0.91, ranging from 12 to 16 years. Among the participants, 23.1% (n = 89) were in the seventh grade, 37.7% (n = 145) in the eighth grade, and 39.2% (n = 151) in the ninth grade. Regarding birth order, 49.4% (n = 190) were firstborns, 43.1% (n = 166) were second-borns, 5.5% (n = 21) were third-borns, and 2.1% (n = 8) were fourth-born or later.

In terms of mothers' educational levels: 27% (n = 104) had less than a high school diploma or a diploma, 16.1% (n = 62) had an associate degree, 34.5% (n = 133) had a bachelor's degree, and 22.3% (n = 86) had a master's degree or higher. Regarding mothers' occupations: 62.3% (n = 240) were homemakers, 1.0% (n = 4) were laborers, 7.3% (n = 28) were self-employed, 24.2% (n = 93) were employees, and 5.2% (n = 20) were retired.

For fathers, 16.9% (n = 65) had a high school diploma or lower, 12.5% (n = 48) had an associate degree, 24.9% (n = 96) had a bachelor's degree, and 45.7% (n = 176) had a master's degree or higher. Regarding fathers' occupations: 3.1% (n = 12) were laborers, 10.9% (n = 42) were self-employed, 77.4% (n = 298) were employees, and 8.6% (n = 33) were retired.

Table 1

Descriptive Statistics and Normality of the Research Variables

Variables	Mean	SD	Skewness	Kurtosis
Risky Behavior Tendencies				
Dangerous driving	12.39	4.84	0.16	-0.34
Violence	14.94	4.62	0.16	-0.25
Smoking	14.99	4.83	0.21	-0.32
Drug use	20.52	9.29	0.21	-1.20
Alcohol consumption	13.97	6.71	0.63	-0.70
Opposite-gender friendship	13.72	4.49	0.12	-0.84
Sexual relationship/behavior	5.89	4.79	0.16	-1.03
Total risky behaviors score	96.42	30.43	0.28	-0.50
Psychological Capital				
Self-efficacy	26.80	6.74	-0.98	0.02
Hope	26.69	6.98	-0.86	-0.34

Resilience	26.55	6.74	-0.90	0.01
Optimism	26.20	6.52	-0.95	0.05
Total psychological capital	106.23	25.51	-0.92	-0.17
Attachment Styles				
Secure attachment	25.46	7.20	-0.67	-0.51
Avoidant insecure attachment	14.44	6.20	0.97	-0.14
Ambivalent insecure attachment	16.56	6.76	0.69	-0.68
Cognitive Emotion Regulation				
Negative regulation strategies	59.81	16.12	-0.16	-0.49
Positive regulation strategies	52.09	9.77	-0.40	-1.23

Table 1 presents the descriptive statistics, including the means and standard deviations, for scores on risky behavior tendencies, psychological capital, attachment styles, and cognitive emotion regulation. The skewness values for all variables fell within the acceptable range of -2 to +2, indicating that the data were normally distributed in terms of skewness. Similarly, the kurtosis values also ranged between -2 and +2, confirming that the distributions of all study variables exhibit acceptable levels of peakedness. Thus, the distributions of risky behaviors, psychological capital, attachment styles, and cognitive emotion regulation can be considered statistically normal.

Table 2

Pearson Correlation Matrix of Research Variables

Variables	1	2	3	4	5	6	7
1. Risky Behavior Tendencies	1						
2. Psychological Capital	−.62	1					
3. Secure Attachment Style	−.65	.70	1				
4. Avoidant Insecure Attachment	.59	−.63	−.65	1			
5. Ambivalent Insecure Attachment	.64	.66	−.77	.68	1		
6. Negative Cognitive Emotion Reg.	.59	−.53	−.56	.55	.56	1	
7. Positive Cognitive Emotion Reg.	−.54	.54	.50	−.40	−.49	−.47	1

According to the Pearson correlation results presented in Table 2, risky behavior tendencies were significantly and negatively correlated with psychological capital ($r = -.62$, $p < .01$), secure attachment style ($r = -.65$, $p < .01$), and positive cognitive emotion regulation ($r = -.54$, $p < .01$), at the 99% confidence level. Conversely, risky behavior tendencies were significantly and positively correlated with avoidant insecure attachment style ($r = .59$, $p < .01$), ambivalent insecure attachment style ($r = .64$, $p < .01$), and negative cognitive emotion regulation ($r = .59$, $p < .01$), also at the 99% confidence level. These correlations provide a foundation for testing the mediating role of cognitive emotion regulation in the relationship between psychological capital and attachment styles with risky behaviors.

To investigate the relationship between psychological capital and attachment styles with risky behavior tendencies through the mediating role of cognitive emotion regulation, structural equation modeling (SEM) was employed. Prior to analysis, the necessary assumptions for SEM were tested.

One of the critical assumptions is the absence of multicollinearity among predictor variables, which was examined using tolerance and variance inflation factor (VIF). Tolerance values close to or below 0.20 and VIF values greater than 5 suggest high multicollinearity (Chatterjee & Simonoff, 2013). In this study, the VIF (and corresponding tolerance values in parentheses) for psychological capital, secure attachment, avoidant insecure attachment, ambivalent insecure attachment, negative cognitive emotion regulation, and positive cognitive emotion regulation were 2.47 (.40), 3.06 (.33), 2.25 (.45), 2.99 (.33), 1.72 (.58), and 1.56 (.64), respectively. These values indicate low multicollinearity among predictors, thus meeting the assumption for SEM.

Additionally, the Durbin–Watson statistic was 1.59, which falls within the acceptable range of 1.5 to 2.5, indicating that the assumption of independence of residuals was not violated. The standardized path coefficients of the final research model are illustrated in Figure 1.

Figure 1

Model Fit Indices

Chi-Square=5878.22, df=2190, P-value=0.00000, RMSEA=0.066
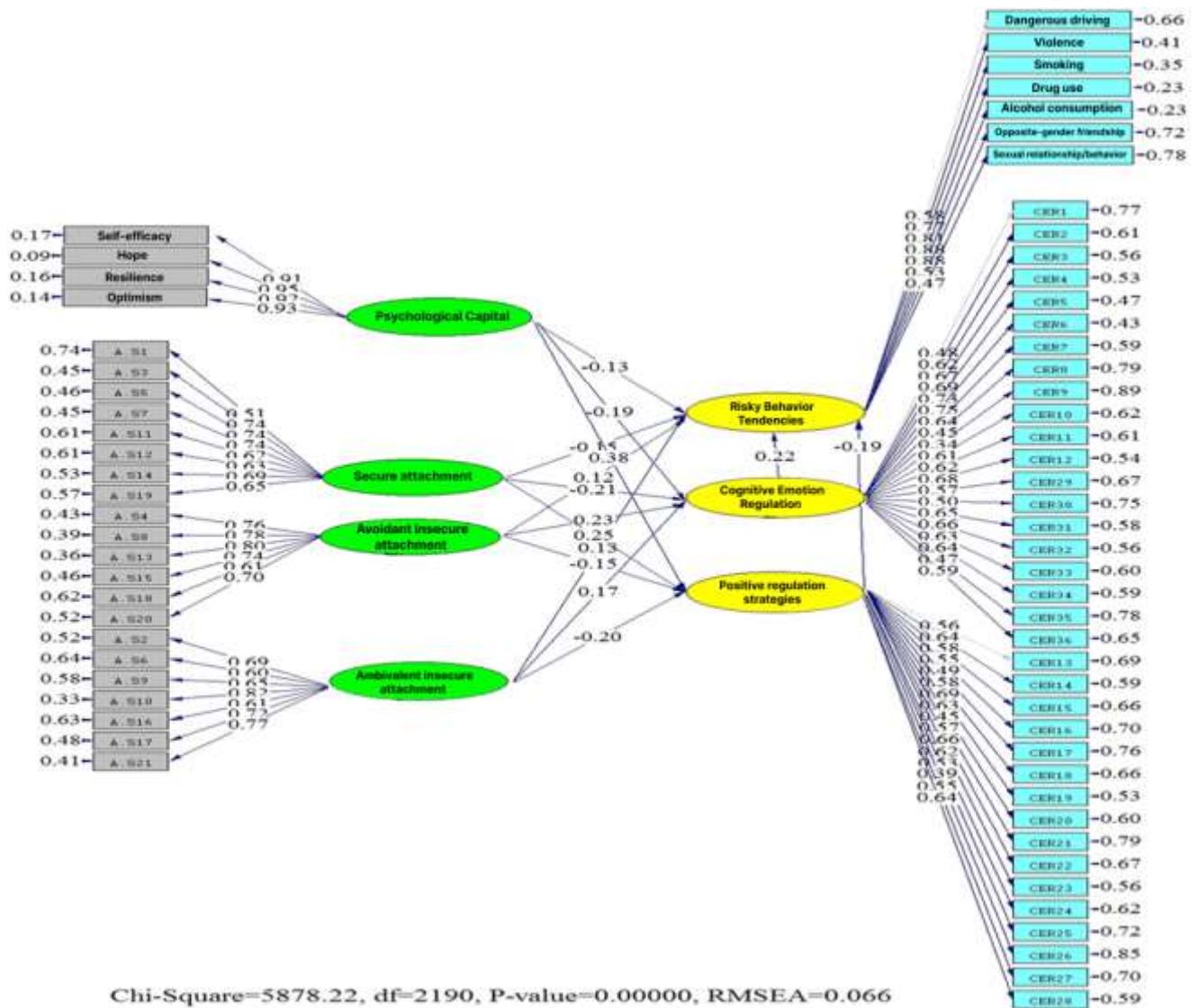
Table 3

Model Fit Indices

Fit Index	Value	Acceptable Range	Result
Chi-square/df	2.68	Less than 3	Acceptable
RMSEA (Root Mean Square Error)	.066	Good: < .08; Moderate: .08–.10	Good
CFI (Comparative Fit Index)	.93	Greater than .90	Acceptable
GFI (Goodness-of-Fit Index)	.92	Greater than .90	Acceptable
AGFI (Adjusted Goodness-of-Fit)	.86	Greater than .80	Acceptable

The structural model fit indices are presented in Table 3. As shown, all values fall within the acceptable or good range, indicating that the proposed model has a good fit with the data. Therefore, the hypothesized model structure is supported.

Table 4

Direct Effects in the Research Model

Pathway	Path Coefficient (β)	T-value	Standard Error	Significance
Psychological Capital → Risky Behaviors	–0.13	–2.51	0.103	p < .05
Psychological Capital → Negative Cognitive Emotion Reg.	–0.19	–3.47	0.042	p < .05
Psychological Capital → Positive Cognitive Emotion Reg.	0.38	6.29	0.018	p < .05
Secure Attachment → Risky Behaviors	–0.15	–2.80	0.082	p < .05
Secure Attachment → Negative Cognitive Emotion Reg.	–0.21	–3.68	0.035	p < .05
Secure Attachment → Positive Cognitive Emotion Reg.	0.25	4.37	0.022	p < .05
Avoidant Attachment → Risky Behaviors	0.12	2.37	0.112	p < .05
Avoidant Attachment → Negative Cognitive Emotion Reg.	0.23	4.05	0.028	p < .05
Avoidant Attachment → Positive Cognitive Emotion Reg.	–0.15	–2.92	0.054	p < .05
Ambivalent Attachment → Risky Behaviors	0.13	2.56	0.099	p < .05
Ambivalent Attachment → Negative Cognitive Emotion Reg.	0.17	3.09	0.048	p < .05
Ambivalent Attachment → Positive Cognitive Emotion Reg.	–0.20	–3.55	0.038	p < .05
Negative Cognitive Emotion Regulation → Risky Behaviors	0.22	3.83	0.031	p < .05
Positive Cognitive Emotion Regulation → Risky Behaviors	–0.19	–3.39	0.035	p < .05

As shown in Table 4, all direct path coefficients between the research variables were statistically significant at $p < .05$. Specifically, risky behavior tendencies in adolescent girls had a significant negative direct relationship with psychological capital (β = –0.13, T = –2.51), secure attachment style (β = –0.15, T = –2.80), and positive cognitive emotion regulation (β = –0.19, T = –3.39). Conversely, significant positive direct relationships were found between risky behaviors and avoidant attachment style (β = 0.12, T = 2.37), ambivalent attachment style (β = 0.13, T = 2.56), and negative cognitive emotion regulation (β = 0.22, T = 3.83).

To examine the indirect effects of psychological capital and attachment styles on risky behaviors through the mediating role of cognitive emotion regulation, the Sobel test was conducted. The magnitude of indirect effects was assessed using the VAF (Variance Accounted For) statistic. Results are presented in Table 5.

Table 5

Analysis of Indirect Effects

Indirect Pathway	T-Sobel	Standardized Indirect Effect	VAF	Significance	Conclusion
Psychological Capital → Neg. Emotion Reg. → Risky Behaviors	3.951	0.042	0.243	p < .05	Confirmed
Psychological Capital → Pos. Emotion Reg. → Risky Behaviors	7.552	0.072	0.357	p < .05	Confirmed
Secure Attachment → Neg. Emotion Reg. → Risky Behaviors	4.581	0.046	0.235	p < .05	Confirmed
Secure Attachment → Pos. Emotion Reg. → Risky Behaviors	5.482	0.048	0.241	p < .05	Confirmed
Avoidant Attachment → Neg. Emotion Reg. → Risky Behaviors	5.371	0.051	0.297	p < .05	Confirmed
Avoidant Attachment → Pos. Emotion Reg. → Risky Behaviors	2.676	0.029	0.192	p < .05	Confirmed
Ambivalent Attachment → Neg. Emotion Reg. → Risky Behaviors	3.482	0.037	0.223	p < .05	Confirmed
Ambivalent Attachment → Pos. Emotion Reg. → Risky Behaviors	3.731	0.038	0.226	p < .05	Confirmed

Based on the T-Sobel values in Table 5 (all exceeding the critical range of ±1.96), the indirect effects of psychological capital and attachment styles on risky behavior tendencies are statistically significant. This confirms that, in addition to direct effects, psychological capital and attachment styles also influence risky behaviors indirectly through cognitive emotion regulation.

Specifically, 24.3% of the effect of psychological capital, 23.5% of the effect of secure attachment, 29.7% of the effect of avoidant attachment, and 22.3% of the effect of ambivalent attachment on risky behaviors were explained through negative cognitive emotion regulation. Additionally, 35.7% of the effect of psychological capital, 24.1% of secure attachment, 19.2% of avoidant attachment, and 22.6% of ambivalent attachment on risky behaviors were explained through positive cognitive emotion regulation.

4. Discussion and Conclusion

The findings of this study confirmed the significant role of psychological capital and attachment styles in predicting high-risk behaviors in adolescent girls, with cognitive emotion regulation serving as a mediating mechanism. Direct path analysis revealed that higher psychological capital significantly predicted lower tendencies toward risky behaviors. Secure attachment styles were also negatively associated with these behaviors, while avoidant and ambivalent insecure attachment styles showed significant positive relationships with high-risk tendencies. Furthermore, positive cognitive emotion regulation strategies were negatively associated with risky behaviors, whereas negative emotion regulation strategies showed a positive and significant link. The indirect path analysis using Sobel's test supported the mediating role of both positive and negative cognitive emotion regulation in the relationship between psychological capital and attachment styles with risky behavior tendencies.

The inverse association between psychological capital and risky behaviors observed in this study is consistent with previous research emphasizing the protective nature of psychological capital in adolescent populations. Psychological capital, comprising resilience, optimism, hope, and self-efficacy, equips adolescents with internal resources to navigate challenging life situations without resorting to maladaptive coping mechanisms such as substance use or aggression (Ballabrera et al., 2023; Barahoyi et al., 2023). These findings align with studies suggesting that adolescents with high psychological capital are more likely to regulate their emotions effectively, engage in goal-directed behaviors, and make constructive decisions in high-risk situations (Bi & Jin, 2021; Blasco-Giner et al., 2023; Gavanji et al., 2024). Jia et al. (Jia et al., 2021) also demonstrated that psychological capital significantly mediates the relationship between socioeconomic stressors and risk-taking behavior, reinforcing its role as a critical buffer against behavioral maladjustment.

Moreover, the results demonstrated that psychological capital positively predicted the use of adaptive cognitive emotion regulation strategies (e.g., positive reappraisal, acceptance) and negatively predicted maladaptive strategies (e.g., catastrophizing, rumination). This finding supports earlier work by Wang et al. (Wang et al., 2021), who found that psychological capital strengthens emotional resilience and moderates the impact of negative emotions on behavioral outcomes. Similarly, Xue et al. (Xue et al., 2022) identified psychological capital as a key moderator in the relationship between stress and PTSD symptoms through the mediating effect of maladaptive cognitive emotion regulation, which echoes the pathways identified in the current study. Thus, psychological capital can be considered not only a direct protective factor but also an indirect enhancer of adaptive emotion regulation strategies that reduce adolescents' vulnerability to high-risk behaviors.

The present study also corroborates a well-documented relationship between attachment styles and adolescent risk-taking behaviors. Secure attachment was associated with fewer risky behaviors, whereas both avoidant and ambivalent insecure attachments were linked to increased risk-taking. These findings are in line with the theoretical framework of attachment theory, which posits that securely attached adolescents develop internal working models of trust, safety, and emotional stability, allowing for better emotion regulation and less susceptibility to external influences (Cavicchioli et al., 2023; Kim, 2020). In contrast, insecure attachment styles are associated with emotional dysregulation and heightened vulnerability to maladaptive behavioral patterns such as substance use, aggression, or risky sexual behaviors (Chokan Sonbol et al., 2023; Mohammadi Hosseini Asl et al., 2022). These associations have been confirmed across different cultural settings and demographic groups (Lawrence et al., 2023; Mohammadzadeh et al., 2020; Owino et al., 2021).

Further, the study found that attachment styles significantly predicted both positive and negative emotion regulation strategies. Secure attachment was positively associated with adaptive regulation, while insecure attachments were associated with maladaptive strategies. These findings support the results of Noroozi and Janjani (Noroozi & Janjani, 2023), who demonstrated that difficulty in emotional regulation mediates the relationship between insecure attachment and rumination in adolescent girls exhibiting risky behaviors. Likewise, Sefidrood and Hobbi (Sefidrood & Hobbi, 2023) emphasized the role of attachment styles and cognitive regulation in predicting tendencies toward risk behaviors. Thus, this study expands on prior evidence by showing that attachment styles not only influence behavior directly but also shape the adolescent's emotional regulation repertoire, which in turn affects behavioral outcomes.

The findings regarding the mediating role of cognitive emotion regulation offer important insights into the mechanisms underlying risky behavior. Positive strategies like reappraisal and planning were found to mediate the relationship between both psychological capital and secure attachment with lower risky behaviors, while negative

strategies such as rumination and self-blame mediated the link between insecure attachments and increased risky behavior. These results are in line with Francesconi et al. (Francesconi et al., 2023), who found that poor emotion regulation underlies decision-making deficits that contribute to behavioral issues. Guo et al. (Guo et al., 2023) also reported that cognitive emotion regulation strategies and depression serially mediate the relationship between childhood maltreatment and internet addiction, underscoring the relevance of emotional processes in adolescent psychopathology.

Singh and Singh (Singh, 2023) and Tucker et al. (Tucker et al., 2022) also provide supporting evidence, showing that emotion regulation difficulties contribute significantly to the likelihood of adolescents engaging in health-risk behaviors such as alcohol use and risky sexual activity. In another relevant study, Cummings et al. (Cummings et al., 2023) demonstrated that emotion regulation-focused interventions reduced risky sexual behaviors among at-risk adolescents, suggesting that improving cognitive regulation skills can directly reduce behavioral vulnerability. These findings highlight the potential for cognitive emotion regulation to serve as an actionable target for intervention, particularly for adolescents with low psychological capital or insecure attachment patterns.

Despite the strengths of the present study, including the use of structural equation modeling and a well-powered sample, several limitations should be acknowledged. First, the cross-sectional nature of the design limits the ability to infer causality among the studied variables. Longitudinal designs would provide more definitive evidence regarding the temporal order of effects and the development of high-risk behaviors over time. Second, the reliance on self-report questionnaires introduces the possibility of response bias, particularly in the domain of risky behaviors, where social desirability and fear of disclosure may affect the accuracy of reporting. Third, while the study focused on female adolescents in an urban Iranian context, its findings may not be generalizable to male adolescents, rural populations, or adolescents in other sociocultural contexts. Additionally, the exclusion of variables such as peer influence, parental monitoring, and mental health status may have limited the scope of the model. Finally, although cognitive emotion regulation was assessed in both positive and negative dimensions, the study did not analyze the role of specific strategies (e.g., suppression vs. rumination) independently, which could offer more nuanced insights.

Future studies should consider longitudinal designs that track adolescents over time to establish causal relationships among psychological capital, attachment, emotion regulation, and risky behaviors. Additionally, future research would benefit from integrating multi-informant data—such as parent or teacher reports—to corroborate adolescents' self-reports and reduce bias. Studies should also examine these dynamics in more diverse populations, including boys, non-binary adolescents, and youth from various cultural, socioeconomic, and rural backgrounds. Expanding the scope of mediating variables to include self-esteem, peer influence, and executive functioning could enrich existing models. Finally, experimental studies implementing targeted interventions on psychological capital and emotion regulation could further validate their protective effects and offer evidence for scalable prevention programs in schools and communities.

To reduce adolescents' engagement in high-risk behaviors, practitioners should focus on strengthening psychological capital through resilience-building, optimism enhancement, and self-efficacy training programs. Emotion regulation skills should be explicitly taught in school curricula, using evidence-based approaches such as mindfulness, cognitive-behavioral strategies, and socio-emotional learning frameworks. Parents and caregivers should be supported in developing secure attachment relationships with their children through family-based interventions and parenting workshops. School psychologists and counselors should also be trained to identify adolescents with insecure attachment patterns or poor emotion regulation and provide early, individualized support. Educational policymakers must prioritize mental health resources in school settings to provide equitable access to psychological services, especially in underserved communities. Ultimately, a multisystemic approach that integrates schools, families, and community organizations will be most effective in promoting adolescent well-being and preventing risk behaviors.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

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

Transparency Statement

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

Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent. The ethics committee of Islamic Azad University, Science and Research Branch, approved this study with ethics code IR.IAU.R.REC.1403.022.

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