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Comparison of the Effectiveness of Psychological Capital Training, Adolescent-Centered Mindfulness, and Healthy Human Theory Educational Packages on Frustration Tolerance and Hope among Female Upper Secondary School Students

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A B S T R A C T

Objective: The objective of this study was to compare the effectiveness of Psychological Capital Training, Adolescent-Centered Mindfulness, and Healthy Human Theory educational packages on frustration tolerance and hope in female upper secondary school students.

Methods and Materials: This quasi-experimental study employed a pretest–posttest control group design with a three-month follow-up. The statistical population consisted of female upper secondary school students in District 2 of Isfahan during the 2023–2024 academic year, from which 80 students were selected through multistage sampling and randomly assigned to three experimental groups and one control group. The experimental groups received Psychological Capital Training, Adolescent-Centered Mindfulness, or Healthy Human Theory interventions in ten weekly 60-minute sessions, while the control group received no intervention. Data were collected using the Frustration Tolerance Questionnaire and the Snyder Hope Scale at pretest, posttest, and follow-up. Repeated measures analysis of variance and Bonferroni post hoc tests were applied using SPSS-25.

Findings: Between-subjects analysis revealed significant differences among the groups for frustration tolerance ($F = 3.18$, $p < .05$) and hope ($F = 14.41$, $p < .001$). Within-subjects analysis indicated significant main effects of time for frustration tolerance ($F = 241.31$, $p < .001$) and hope ($F = 160.32$, $p < .001$), as well as significant time × group interactions for frustration tolerance ($F = 31.90$, $p < .001$) and hope ($F = 17.33$, $p < .001$). Post hoc comparisons showed that all three interventions significantly reduced frustration intolerance and increased hope relative to the control group, with mindfulness and healthy human interventions demonstrating stronger effects on hope at follow-up.

Conclusion: Psychological Capital Training, Adolescent-Centered Mindfulness, and Healthy Human Theory interventions are effective in enhancing frustration tolerance and hope among adolescent girls, with mindfulness and healthy human approaches yielding superior long-term improvements in hope.

Keywords: *Psychological Capital, Mindfulness, Healthy Human Theory, Frustration Tolerance, Hope*

1. Introduction

Adolescence represents a critical developmental stage characterized by heightened emotional reactivity, identity formation, and increasing academic and social demands, which together place adolescents at substantial psychological risk. Contemporary educational and psychological research increasingly emphasizes the role of internal psychological resources in buffering stress and promoting adaptive functioning during this sensitive period (Jones et al., 2023; Sharifian Motlaq & Mohammadi, 2025). Among these resources, frustration tolerance and hope have emerged as central constructs associated with emotional regulation, academic engagement, resilience, and overall mental health. Low frustration tolerance has been linked to academic burnout, maladaptive coping strategies, and vulnerability to emotional disorders in adolescents (Jo et al., 2013; Nordman & Adcock, 2023), whereas hope functions as a protective motivational system that facilitates goal pursuit, perseverance, and psychological well-being (Demirtaş & Uygun-Eryurt, 2022; Gruber, 2024). Consequently, identifying effective intervention models that strengthen these psychological capacities is a growing priority in educational psychology.

Frustration tolerance refers to the individual's capacity to endure emotional discomfort, obstacles, and setbacks without resorting to maladaptive behaviors or cognitive distortions. It plays a pivotal role in adolescents' academic persistence and emotional self-regulation (Jo et al., 2013; Zhou, 2023). Students with low frustration tolerance often exhibit heightened anxiety, impulsivity, emotional dysregulation, and academic disengagement, particularly under conditions of academic pressure and failure (Kim & Jang, 2022; Nordman & Adcock, 2023). Empirical evidence indicates that frustration tolerance is not merely a dispositional trait but a malleable psychological skill that can be enhanced through targeted interventions (Ashrafi et al., 2022; Setarei & Monazzami Tabar, 2022). Therefore, educational systems increasingly seek evidence-based approaches capable of strengthening frustration tolerance in adolescents to promote emotional stability and academic success.

Closely related to frustration tolerance is the construct of hope, conceptualized as a dynamic motivational-cognitive system encompassing goal-directed agency and pathways thinking. Hope enables individuals to generate effective strategies toward goal attainment and sustain motivation in the face of adversity (Demirtaş & Uygun-Eryurt, 2022; Jones et al., 2023). In school settings, higher hope levels are associated with stronger academic engagement, lower academic anxiety, and improved psychological well-being (Gruber, 2024; Sadri et al., 2021). Importantly, hope has also been identified as a critical mediator between environmental stressors and emotional outcomes in adolescents, including academic stress and mental health challenges (Demirtaş & Uygun-Eryurt, 2022; Jones et al., 2023). As such, enhancing hope has become a key objective of contemporary psychological interventions within educational contexts.

Among the most influential psychological intervention frameworks aimed at strengthening internal resources is Psychological Capital (PsyCap). Psychological Capital comprises hope, optimism, resilience, and self-efficacy, representing a synergistic system of positive psychological capacities that foster adaptive functioning and mental health. Extensive empirical research confirms that PsyCap-based interventions significantly improve emotional regulation, distress tolerance, resilience, and academic performance across diverse populations (Mokhtari et al., 2020; Raeisi et al., 2020). In adolescent and family contexts, PsyCap training has demonstrated effectiveness in increasing hope, emotional self-regulation, and coping competence (Mokhtari et al., 2020; Raeisi et al., 2020). These findings underscore the relevance of PsyCap as a foundational framework for promoting adolescent well-being.

Parallel to PsyCap, mindfulness-based interventions have gained substantial empirical support as effective tools for enhancing emotional regulation, distress tolerance, and cognitive flexibility. Mindfulness involves purposeful, nonjudgmental awareness of present-moment experiences, enabling individuals to disengage from maladaptive cognitive patterns and emotional reactivity (Brem et al., 2019; Burdick, 2014). Research consistently demonstrates that mindfulness training improves distress tolerance, reduces emotional dysregulation, and enhances psychological resilience among adolescents and adults (Ashrafi et al., 2022; Hassannejad Emamchay & Zabihi, 2024; Setarei & Monazzami Tabar, 2022). More recent studies further reveal that mindfulness enhances frustration tolerance and buffers the negative effects of academic and emotional stress (Timajchi et al., 2025; Zhong et al., 2025). Adolescent-centered mindfulness programs, specifically tailored to developmental needs, have shown strong efficacy in strengthening emotional stability and self-regulatory capacity (Burdick, 2014; Sharifian Motlaq & Mohammadi, 2025).

JAYPS Adolescent and Youth Psychological Studies
E-ISSN: 2981-2526

A third integrative framework with growing empirical support is Healthy Human Theory (HHT), developed by Aghaei. Healthy Human Theory conceptualizes psychological health as the harmonious development of meaning, emotional balance, cognitive flexibility, self-transcendence, and moral-spiritual growth (Aghaei, 2018, 2019). Unlike symptom-focused models, HHT emphasizes existential meaning-making, adaptive emotional regulation, self-compassion, and purposeful living as core determinants of psychological well-being. Empirical studies indicate that HHT-based interventions significantly improve self-compassion, cognitive flexibility, emotional regulation, academic engagement, and mental health outcomes across diverse populations (Amini et al., 2023; Sadri et al., 2021). By cultivating deep existential resilience and adaptive coping, HHT provides a holistic framework for strengthening adolescents' capacity to manage frustration and sustain hope.

While each of these three approaches—Psychological Capital Training, Adolescent-Centered Mindfulness, and Healthy Human Theory—has demonstrated individual effectiveness, few studies have directly compared their relative impact on frustration tolerance and hope, particularly among adolescent girls. Existing evidence suggests that mindfulness may exert stronger effects on distress tolerance and emotional regulation (Brem et al., 2019; Zhong et al., 2025), whereas PsyCap interventions may more directly enhance hope and motivational resources (Mokhtari et al., 2020; Raeisi et al., 2020). Meanwhile, HHT interventions appear uniquely positioned to integrate existential meaning, emotional balance, and motivational growth into a unified therapeutic model (Amini et al., 2023; Sadri et al., 2021). However, systematic comparative research examining these three frameworks within the same adolescent population remains scarce.

Moreover, the psychological challenges faced by adolescent girls warrant special attention. Gender-based differences in emotional processing, social stress exposure, and vulnerability to internalizing disorders place adolescent girls at heightened risk for emotional dysregulation, low frustration tolerance, and diminished hope (Demirtaş & Uygun-Eryurt, 2022; Kim, 2018). Educational environments further compound these risks through performance pressures, social comparison, and identity conflicts. Therefore, the identification of optimal intervention models for strengthening psychological resilience in adolescent girls constitutes a critical priority for educational psychologists and mental health practitioners.

Given the converging evidence on the importance of frustration tolerance and hope for adolescent functioning, and the demonstrated efficacy of PsyCap, mindfulness, and Healthy Human interventions, a rigorous comparative evaluation of these approaches is urgently needed. Such research not only advances theoretical understanding of psychological resource development but also informs evidence-based practice in educational and clinical settings (Cebrián et al., 2020; Gruber, 2024). By clarifying the differential and overlapping mechanisms through which these interventions operate, educators and clinicians can more effectively tailor prevention and intervention programs to adolescents' developmental needs.

Therefore, the present study aimed to compare the effectiveness of Psychological Capital Training, Adolescent-Centered Mindfulness, and Healthy Human Theory educational packages on frustration tolerance and hope among female upper secondary school students.

2. Methods and Materials

2.1. Study Design and Participants

The present study was a quasi-experimental research with a pretest–posttest control group design and a three-month follow-up period. The statistical population consisted of female upper secondary school students in District 2 of Isfahan during the 2023–2024 academic year. The selection of the educational district was based on the feasibility of conducting the study and the researcher's accessibility. From this population, 80 participants were selected using a multistage sampling procedure. In the first stage, four girls' upper secondary schools were randomly selected from District 2. In the second stage, one class was randomly selected from each school. In the third stage, based on the inclusion criteria of the study, an equal number of female students were purposively selected. Of the four selected schools, three were assigned to the three experimental conditions, and one school was assigned to the control group. The exclusion criteria included unwillingness to continue participation in the study, use of antidepressant or anxiolytic medications, substance abuse, simultaneous participation in other psychological treatments, and absence from more than two intervention sessions. The first experimental group received Healthy Human Theory Counseling (Aghaei, 2018) in 10 weekly 60-minute sessions. The second experimental group received Adolescent-Centered Mindfulness Training based on the therapeutic training package developed by Bordick (2014) in 10 weekly

60-minute sessions. The third experimental group received Psychological Capital Training derived from the therapeutic training package developed by Luthans (Alipour et al., 2013) in 10 weekly 60-minute sessions. The control group did not receive any counseling intervention. Finally, participants completed the study questionnaires at three time points: pretest, posttest, and follow-up.

2.2. Measures

Frustration Tolerance Questionnaire: This scale was developed by Harrington (2005) to assess individuals' level of frustration tolerance in goal pursuit. The questionnaire consists of four factors and is scored on a five-point Likert scale (5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree). Lower total scores indicate higher frustration tolerance, whereas higher total scores indicate lower frustration tolerance. Babaresisi and Alimehdi (2014) reported Cronbach's alpha coefficients of .84 for the total scale, .50 for emotional intolerance, .61 for discomfort intolerance, .52 for achievement intolerance, and .71 for injustice intolerance. Moreover, Cronbach's alpha coefficients in Harrington's original sample were higher than those reported in the Iranian sample, ranging from .78 for discomfort intolerance to .94 for the total scale. In the present study, the reliability of the questionnaire, calculated using Cronbach's alpha, was .82.

Snyder Hope Scale (SHS): This questionnaire, developed by Snyder et al. (1991) to measure hope, consists of 12 items and is administered as a self-report measure. Of these items, four assess agency thinking, four assess pathways thinking, and four are filler items. Accordingly, the scale includes two subscales: agency and pathways. Numerous studies support the reliability and validity of this instrument as a measure of individuals' level of hope. The internal consistency of the total scale ranges from .74 to .84, and the test–retest reliability is .80, increasing further over intervals longer than 8 to 10 weeks. The internal consistency of the agency subscale ranges from .71 to .76, and that of the pathways subscale ranges from .63 to .80. In addition, substantial evidence supports the concurrent validity of the Hope Scale and its predictive capability. For example, the scale correlates between .50 and .60 with measures of optimism, goal expectancy, and self-esteem. Its correlations with the Beck Hopelessness Scale ($r = -.51$) and the Beck Depression Inventory ($r = -.42$) further confirm its validity. In the present study, the reliability of the Hope Scale, calculated using Cronbach's alpha, was .85.

2.3. Interventions

The Psychological Capital Training intervention was implemented in ten structured weekly sessions designed to enhance hope, optimism, self-efficacy, and adaptive attributional styles. The program began with conceptual clarification of hope and hopelessness and the identification of characteristics of hopeful individuals, followed by an assessment of participants' existing levels of hope and life satisfaction and the development of motivational readiness. Subsequent sessions focused on increasing awareness of learned helplessness and its detrimental effects on optimism and self-efficacy, educating participants on the central role of goal-setting in fostering hope, and introducing attribution processes and locus of control concepts. Participants were trained to formulate clear, attainable goals and to differentiate between internal–external, global–specific, and stable–unstable attributions and their influence on optimism and hope. The intervention further emphasized breaking large goals into manageable subgoals, using mental imagery to strengthen positive experiences and self-efficacy, developing positive internal attributions through modeling of highly self-efficacious individuals, and cultivating daily goal-setting behaviors. Later sessions addressed transforming obstacles into challenges, identifying personal and environmental strengths, and reinforcing successful experiences through direct and vicarious reinforcement. The final session integrated all learned skills through review and applied exercises aimed at consolidating hope and optimism.

The Adolescent-Centered Mindfulness Training program was delivered across ten weekly sessions and focused on cultivating present-moment awareness, emotional regulation, and adaptive cognitive processing. The program began with an introduction to mindfulness, clarification of its purpose, and training in planning and integrating mindfulness exercises into daily life. Participants practiced mindful breathing and diaphragmatic breathing, explored the distinction between an agitated and calm mind through experiential demonstrations, and engaged in regular home practice. Progressive sessions incorporated body scan meditation, awareness of the present moment through sensory exercises, mindful movement, and systematic training in five-sense mindfulness, including mindful eating, listening, touching, smelling, and seeing. Emotional mindfulness was strengthened through exercises focused on observing emotions without reactivity, compassion-based meditation, and strategies for remaining grounded during emotional challenges. Later sessions introduced mindfulness

JAYPS Adolescent and Youth Psychological Studies
E-ISSN: 2981-2526

of thoughts using cognitive defusion techniques, depression-relief meditation, progressive muscle relaxation, sleep meditation, journaling of mindfulness experiences, and mindfulness application in everyday activities. The final session consolidated these practices through reflection on participants' experiences, repetition of core mindfulness exercises, compassion meditation, and reinforcement of sustained mindfulness in daily life.

The Healthy Human Theory intervention was conducted in ten sessions aimed at cultivating psychological well-being through meaning-making, emotional balance, self-transformation, and moral-spiritual growth. The initial sessions focused on group formation, orientation, administration of baseline assessments, and comprehensive training in the concept of meaning, including identification of personal meanings and differentiation between constructive and maladaptive life meanings. Subsequent sessions addressed emotional regulation through techniques for achieving and maintaining inner calm, developing flow experiences, and using cognitive reappraisal and positive transformation strategies. Participants engaged in structured activities to develop contentment, transform desires into realistic goals, and practice generosity and self-reflection. Forgiveness skills were introduced with emphasis on unconditional forgiveness, personal satisfaction, self-renewal, and consultative reflection. Hope enhancement strategies were taught alongside energy-activation techniques and stressor identification. Additional sessions cultivated enjoyment of life through sensory awareness, grief processing through authentic emotional understanding, development of compassionate relationships with self, others, and transcendent values, and deepening existential awareness. The final session focused on metacognitive development through experiential analysis, acceptance strategies, knowledge expansion, integration of core principles of the Healthy Human model, posttest administration, and comprehensive program synthesis.

2.4. Data Analysis

The collected data were analyzed using repeated measures analysis of variance and Bonferroni post hoc tests in SPSS version 25.

3. Findings and Results

The descriptive findings of the demographic variables are presented in Table 1.

Table 1

Demographic Variables by Group

Variable	Category	Psychological Capital Training	Adolescent-Centered Mindfulness	Healthy Human Theory	Control	χ^2 (p)
Grade	Tenth	8 (40%)	9 (45%)	8 (40%)	9 (45%)	2.64 (.853)
	Eleventh	9 (45%)	6 (30%)	10 (50%)	8 (40%)	
	Twelfth	3 (15%)	5 (25%)	2 (10%)	3 (15%)	
Field of Study	Humanities	10 (50%)	10 (50%)	7 (35%)	4 (20%)	5.86 (.439)
	Experimental Sciences	7 (35%)	6 (30%)	9 (45%)	12 (60%)	
	Mathematics	3 (15%)	4 (20%)	4 (20%)	4 (20%)	

The results of the chi-square test indicated that there were no statistically significant differences among the four groups in terms of grade level and field of study ($p > .05$). The descriptive statistics of the research variables are presented in Table 2.

Table 2

Descriptive Statistics of Research Variables by Group and Measurement Stage

Variable	Group	Pretest Mean	SD	Posttest Mean	SD	Follow-up Mean	SD
Frustration Tolerance	Psychological Capital Training	109.35	13.69	94.65	15.05	97.30	16.12
	Adolescent-Centered Mindfulness	113.10	14.91	98.15	13.37	100.90	14.49
	Healthy Human Theory	113.65	11.98	96.40	10.30	97.90	9.40
	Control	111.45	11.33	111.80	11.79	112.75	11.61

JAYPS Adolescent and Youth Psychological Studies E-ISSN: 2981-2526

Hope	Psychological Capital Training	24.15	6.85	34.70	4.41	34.70	4.85
	Adolescent-Centered Mindfulness	27.70	7.02	38.35	4.05	38.90	3.87
	Healthy Human Theory	27.80	5.61	37.45	4.98	38.15	4.94
	Control	26.25	6.30	26.55	5.53	26.25	4.85

As shown in Table 2, the mean scores of hope in the experimental groups increased more than in the control group at both the posttest and follow-up stages compared with the pretest stage, whereas the mean scores of frustration tolerance in the experimental groups decreased more than in the control group at both the posttest and follow-up stages compared with the pretest stage. (In the Frustration Tolerance Questionnaire developed by Harrington {2005}, lower total scores indicate higher frustration tolerance, whereas higher total scores indicate lower frustration tolerance.)

The use of parametric repeated-measures tests requires compliance with several preliminary assumptions, including normality of score distributions, homogeneity of variances, and equality of covariance matrices. When group sizes are fewer than 40 participants, these tests can be applied provided that the assumptions are met. The normality assumption evaluates whether the observed score distribution is consistent with the normal population distribution. This assumption implies that the observed difference between the sample distribution and the normal population distribution equals zero. Accordingly, the Shapiro–Wilk test was used. The results indicated that the null hypothesis of normal distribution was retained for all research variables across the three measurement stages (pretest, posttest, and follow-up) in all four groups (all p values > .05).

To examine the assumption of homogeneity of variances, Levene's test was applied. The results showed that for frustration tolerance, pretest ($F = 1.29$, $p = .283$), posttest ($F = 1.67$, $p = .181$), and follow-up ($F = 2.25$, $p = .089$), and for hope, pretest ($F = 0.272$, $p = .846$), posttest ($F = 0.628$, $p = .599$), and follow-up ($F = 0.451$, $p = .717$), the assumption of homogeneity of variances was satisfied for both variables across all three stages.

Mauchly's test of sphericity was conducted to evaluate the equality of covariance matrices across groups. The results for frustration tolerance (Mauchly's $W = .609$, $\chi^2 = 37.22$, $p = .001$) and hope (Mauchly's $W = .194$, $\chi^2 = 122.92$, $p = .001$) indicated that the assumption of sphericity was violated for both research variables. Therefore, conservative corrections such as the Greenhouse–Geisser adjustment were applied in the within-subjects analyses of the repeated-measures ANOVA. The results of the between-subjects and within-subjects comparisons for the research variables are presented in Table 3.

Table 3

Results of Between-Subjects and Within-Subjects Effects Analysis for the Research Variables

Variable	Effect Type	Source	Sum of Squares	df	Mean Square	F	Sig.	Effect Size (η^2)	Power
Frustration Tolerance	Between-Subjects	Group	4591.55	3	1530.517	3.18	.029	.112	.715
	Within-Subjects	Time	6241.508	1.438	4341.782	241.312	.001	.760	1.000
		Time × Group	2475.425	4.547	544.448	31.902	.001	.557	1.000
Hope	Between-Subjects	Group	2838.946	3	946.315	14.41	.001	.363	.001
	Within-Subjects	Time	3336.058	1.108	3012.164	160.323	.001	.678	1.000
		Time × Group	1081.842	3.323	325.602	17.330	.001	.406	1.000

Based on the findings presented in Table 3, the between-subjects analysis demonstrated statistically significant differences between the experimental groups (Psychological Capital Training, Adolescent-Centered Mindfulness, and Healthy Human Theory) and the control group in both frustration tolerance ($F = 3.18$, $p < .05$) and hope ($F = 14.41$, $p < .001$). The within-subjects analysis also revealed a significant main effect of time, indicating significant differences across the measurement stages for frustration tolerance ($F = 241.312$, $p < .001$) and hope ($F = 160.323$, $p < .001$). Furthermore, the interaction effect between time and group membership was statistically significant for both frustration tolerance ($F = 31.902$, $p < .001$) and hope ($F = 17.330$, $p < .001$), indicating that the changes observed from pretest to posttest and follow-up differed significantly among the groups. The proportion of variance explained by group differences across time was 55.7% for frustration tolerance and 40.6% for hope.

JAYPS Adolescent and Youth Psychological Studies
E-ISSN: 2981-2526

Table 4

Post Hoc Test Results for Group Comparisons Across Study Phases

Variable	Group	Phase 1	Phase 2	Mean Difference	Sig.
Frustration Tolerance	Psychological Capital Training	Pretest	Posttest	14.70	.001
		Pretest	Follow-up	12.05	.001
		Posttest	Follow-up	2.65	.124
	Healthy Human Theory	Pretest	Posttest	17.25	.001
		Pretest	Follow-up	16.05	.001
		Posttest	Follow-up	−1.20	.372
	Adolescent-Centered Mindfulness	Pretest	Posttest	14.95	.001
		Pretest	Follow-up	12.20	.001
		Posttest	Follow-up	2.75	.096
	Control	Pretest	Posttest	−0.35	.995
		Pretest	Follow-up	−1.30	.365
		Posttest	Follow-up	−0.95	.578
Hope	Psychological Capital Training	Pretest	Posttest	10.55	.001
		Pretest	Follow-up	10.56	.001
		Posttest	Follow-up	0.01	.999
	Healthy Human Theory	Pretest	Posttest	−9.65	.001
		Pretest	Follow-up	−10.35	.001
		Posttest	Follow-up	0.70	.122
	Adolescent-Centered Mindfulness	Pretest	Posttest	10.65	.001
		Pretest	Follow-up	11.20	.001
		Posttest	Follow-up	−0.55	.282
	Control	Pretest	Posttest	−0.30	.992
		Pretest	Follow-up	0.001	.999
		Posttest	Follow-up	−0.30	.991

The results in Table 4 indicate that the mean differences in frustration tolerance and hope between the pretest and posttest phases, as well as between the pretest and follow-up phases, were statistically significant in all three experimental groups (Psychological Capital Training, Adolescent-Centered Mindfulness, and Healthy Human Theory) ($p < .01$). However, the mean differences between the posttest and follow-up phases for both frustration tolerance and hope were not statistically significant in these groups ($p > .05$). In the control group, none of the differences among the three study phases were statistically significant ($p > .05$). Accordingly, the within-group effects indicate that in all three experimental groups, mean scores of frustration tolerance decreased from pretest to posttest and follow-up, with stability observed between posttest and follow-up. In addition, the mean scores of hope increased from pretest to posttest and follow-up, with stability observed between posttest and follow-up.

4. Discussion

The present study sought to compare the effectiveness of three theoretically grounded intervention packages—Psychological Capital Training, Adolescent-Centered Mindfulness, and Healthy Human Theory—on frustration tolerance and hope among female upper secondary school students. The findings demonstrated that all three interventions produced statistically significant improvements in both frustration tolerance and hope compared with the control condition, with effects maintained at the three-month follow-up. Moreover, comparative analyses indicated that Adolescent-Centered Mindfulness and Healthy Human Theory were more effective than Psychological Capital Training in enhancing hope at follow-up, while all three approaches were similarly effective in reducing frustration intolerance. These results provide strong empirical support for the role of integrative psychological interventions in strengthening adolescents' emotional resilience and motivational functioning, consistent with contemporary models of positive psychology and developmental intervention science (Jones et al., 2023; Sharifian Motlaq & Mohammadi, 2025).

The significant reduction in frustration intolerance across all three intervention groups highlights the malleability of this construct during adolescence and its responsiveness to structured psychological training. Frustration intolerance has been repeatedly identified as a core vulnerability factor

JAYPS Adolescent and Youth Psychological Studies E-ISSN: 2981-2526

in academic burnout, emotional dysregulation, and maladaptive coping in youth (Jo et al., 2013; Nordman & Adcock, 2023). The present findings align with prior evidence demonstrating that psychological skills training can substantially enhance distress and frustration tolerance. For instance, mindfulness-based programs have consistently produced improvements in distress tolerance and emotional stability among both clinical and non-clinical populations (Ashrafi et al., 2022; Hassannejad Emamchay & Zabihi, 2024; Setarei & Monazzami Tabar, 2022). Similarly, Psychological Capital interventions have been shown to improve emotional regulation and distress tolerance by strengthening core positive resources such as self-efficacy, optimism, resilience, and hope (Mokhtari et al., 2020; Raeisi et al., 2020). The effectiveness of Healthy Human Theory in reducing frustration intolerance extends previous research demonstrating its capacity to enhance emotional balance, self-compassion, and adaptive coping through meaning-oriented and integrative psychological development (Amini et al., 2023; Sadri et al., 2021).

The observed increase in hope across all experimental conditions further underscores the central role of these interventions in cultivating motivational resilience among adolescents. Hope, as a cognitive-motivational system encompassing agency and pathways thinking, is strongly associated with academic engagement, emotional well-being, and perseverance under stress (Demirtaş & Uygun-Eryurt, 2022; Gruber, 2024). Psychological Capital Training directly targets hope as one of its core components, which likely explains the substantial improvement observed in this group. These findings replicate and extend earlier work demonstrating that PsyCap-based interventions significantly enhance hope and optimism in both clinical and educational contexts (Mokhtari et al., 2020; Raeisi et al., 2020). However, the superior long-term effects of Adolescent-Centered Mindfulness and Healthy Human Theory on hope suggest that interventions addressing deeper cognitive-emotional processes and existential meaning may exert more durable motivational benefits.

The particularly strong performance of the Adolescent-Centered Mindfulness program in sustaining hope at follow-up can be interpreted through its impact on cognitive reappraisal, emotional regulation, and attentional flexibility. Mindfulness practice enables adolescents to disengage from ruminative thought patterns, regulate emotional responses to setbacks, and maintain present-focused awareness, thereby strengthening adaptive coping and motivational persistence (Brem et al., 2019; Zhong et al., 2025). Prior studies have shown that mindfulness enhances distress tolerance and emotional resilience by modifying both affective and cognitive processes (Ashrafi et al., 2022; Setarei & Monazzami Tabar, 2022; Timajchi et al., 2025). Moreover, mindfulness has been found to indirectly promote hope by improving perceived control and reducing cognitive rigidity (Demirtaş & Uygun-Eryurt, 2022; Zhou, 2023). The present findings provide additional empirical support for these mechanisms within an adolescent educational context.

Similarly, the sustained effectiveness of Healthy Human Theory in enhancing hope can be attributed to its emphasis on existential meaning, self-transcendence, and holistic psychological growth. HHT conceptualizes psychological health as the harmonious development of meaning, emotional balance, cognitive flexibility, and moral-spiritual orientation (Aghaei, 2018, 2019). Through structured training in meaning-making, emotional regulation, forgiveness, self-compassion, and hope cultivation, participants acquire durable internal resources that support long-term motivational stability. Previous investigations have confirmed that HHT-based interventions significantly enhance academic engagement, self-compassion, and emotional well-being across diverse populations (Amini et al., 2023; Sadri et al., 2021). The present results extend this literature by demonstrating that HHT is equally effective in promoting frustration tolerance and sustaining hope among adolescent girls.

The differential impact observed between Psychological Capital Training and the other two interventions on long-term hope may reflect the relative depth of cognitive-emotional restructuring targeted by each model. While PsyCap effectively enhances positive psychological capacities, mindfulness and HHT engage broader existential and attentional processes that may foster more enduring motivational transformations. This interpretation is consistent with theoretical perspectives emphasizing that sustainable psychological change in adolescence requires both skills-based training and deeper meaning-oriented development (Cebrián et al., 2020; Gruber, 2024). Furthermore, the gender-specific nature of the sample is noteworthy. Adolescent girls are particularly vulnerable to emotional dysregulation, rumination, and academic stress, which undermine frustration tolerance and hope (Demirtaş & Uygun-Eryurt, 2022; Kim, 2018). The strong intervention effects observed in this study highlight the relevance of these approaches for addressing gender-related psychological risk factors in educational settings.

JAYPS Adolescent and Youth Psychological Studies
E-ISSN: 2981-2526

5. Conclusion

Taken together, the present findings offer compelling evidence that integrative psychological interventions grounded in positive psychology, mindfulness, and meaning-oriented theory can substantially enhance core psychological resources among adolescents. By strengthening frustration tolerance and hope, these programs contribute not only to emotional well-being but also to academic engagement, resilience, and long-term psychological development. The results further underscore the importance of moving beyond symptom-focused interventions toward comprehensive models that cultivate internal psychological capital and existential resilience in youth (Jones et al., 2023; Sharifian Motlaq & Mohammadi, 2025).

6. Limitations & Suggestions

Despite the robust findings, several limitations should be acknowledged. The study relied exclusively on self-report measures, which may introduce response biases. The sample was limited to female students from a single educational district, restricting generalizability. The follow-up period, although sufficient to demonstrate short-term maintenance, does not permit conclusions regarding long-term sustainability of effects. Finally, the absence of physiological or behavioral indicators limits the multidimensional assessment of intervention outcomes.

Future studies should replicate these findings with more diverse samples, including male adolescents and students from different cultural and socioeconomic contexts. Longitudinal designs with extended follow-up periods would clarify the durability of intervention effects. Incorporating multimethod assessment strategies, including teacher reports and behavioral indicators, would strengthen validity. Comparative studies examining hybrid intervention models that integrate components of mindfulness, psychological capital, and meaning-oriented training may further optimize outcomes.

Educational systems should integrate structured psychological skills programs into school curricula to strengthen students' emotional resilience and motivation. School counselors and psychologists are encouraged to adopt evidence-based interventions targeting frustration tolerance and hope as preventive mental health strategies. Training teachers in the basic principles of these approaches may enhance classroom climate and student engagement. Policymakers should support the implementation of comprehensive psychological development programs as part of holistic educational reform.

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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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Authors' Contributions

Z.R. designed the study, developed the research framework, and supervised the implementation of the intervention programs. A.M. coordinated the sampling procedure, managed data collection in the participating schools, and contributed to the preparation of the educational packages. A.A. performed the statistical analyses, interpreted the findings, and drafted the initial version of the manuscript. All authors participated in the revision of the article, approved the final manuscript, and accept full responsibility for the integrity and accuracy of the work.

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