

Comparison of the Effectiveness of Choice Theory-Based Education and Adolescent-Centered Mindfulness Training on Psychological Capital in Adolescent Football Players

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ABSTRACT

Objective: This study aimed to compare the effectiveness of Choice Theory-based education and adolescent-centered mindfulness training in improving psychological capital among adolescent football players.

Methods and Materials: The study employed a quasi-experimental pretest-posttest control-group design with a two-month follow-up. The statistical population included adolescent football players aged 12–18 years in the Shemiranat region during the 2025–2026 academic year. Using purposive sampling, 45 eligible participants were selected and randomly assigned to a Choice Theory-based education group, an adolescent-centered mindfulness group, or a control group, with 15 participants in each group. The Choice Theory intervention was delivered in eight 90-minute sessions, whereas the adolescent-centered mindfulness intervention was conducted in ten 90-minute sessions. The control group received no intervention during the study period. Psychological capital was assessed at pretest, posttest, and follow-up using the Psychological Capital Questionnaire. Data were analyzed in SPSS version 26 using repeated-measures analysis of variance and post-hoc comparisons.

Findings: Repeated-measures analysis showed a significant main effect of time on psychological capital, $F(1.101, 46.26) = 154.84$, $p < .001$, partial $\eta^2 = .787$. The time $\times$ group interaction was also significant, $F(2.203, 46.26) = 41.24$, $p < .001$, partial $\eta^2 = .663$, indicating different patterns of change across the three groups. In addition, the between-group effect was significant, $F(2, 42) = 20.34$, $p < .001$, partial $\eta^2 = .492$. Post-hoc comparisons showed that both Choice Theory-based education and adolescent-centered mindfulness training significantly improved psychological capital compared with the control group ($p < .01$). Choice Theory-based education was significantly more effective than adolescent-centered mindfulness training, $MD = 3.64$, $p = .044$. Psychological capital was significantly higher at posttest and follow-up than at pretest ($p < .001$), whereas the difference between posttest and follow-up was not significant ($p = .154$), indicating maintenance of intervention effects.

Conclusion: Both Choice Theory-based education and adolescent-centered mindfulness training were effective in improving psychological capital among adolescent football players, with Choice Theory-based education demonstrating greater effectiveness and both interventions showing sustained effects at two-month follow-up.

Keywords: Choice Theory, Mindfulness, Psychological Capital, Adolescent Football Players, Reality Therapy

1. Introduction

Adolescence is a developmental period characterized by rapid physical, cognitive, social, and psychological changes that can substantially influence both general well-being and sport performance. For adolescent athletes, these developmental demands are compounded by training requirements, competitive pressure, performance evaluation, expectations from coaches and parents, peer comparison, and concerns about selection and future athletic progress. Football, in particular, requires sustained concentration, persistence, confidence, rapid decision-making, effective coping with mistakes, and the ability to maintain motivation under uncertain and demanding competitive conditions. Consequently, psychological resources are increasingly recognized as critical determinants of adaptive functioning and performance among adolescent football players. Within positive psychology, psychological capital has emerged as an important construct reflecting a set of developable psychological resources that can help individuals respond more effectively to challenge, adversity, and goal-directed demands. Psychological capital is commonly conceptualized through interrelated capacities such as self-efficacy, hope, resilience, and optimism, all of which may be especially relevant for young athletes who must repeatedly cope with success, failure, competition, physical demands, and performance-related expectations.

Psychological capital differs from relatively stable personality traits because it is viewed as a state-like and potentially modifiable psychological resource. Individuals with higher psychological capital are generally more likely to believe in their ability to accomplish difficult tasks, sustain motivation toward meaningful goals, recover from setbacks, and maintain positive expectations regarding future outcomes. These characteristics are highly relevant to the developmental and performance context of adolescent football. An adolescent football player with strong self-efficacy may be more willing to attempt difficult skills and persist despite mistakes; a hopeful athlete may identify alternative pathways to athletic goals when obstacles arise; a resilient athlete may recover more effectively from defeat, injury, criticism, or non-selection; and an optimistic athlete may interpret temporary setbacks as manageable rather than permanent. Previous intervention research has suggested that psychological capital can be enhanced through structured psychological and educational programs. Reality therapy and Choice Theory-based approaches, for example,

have demonstrated favorable effects on psychological capital among different populations, including adolescent girls and educational groups (Nasiri et al., 2019; Shariati Pour et al., 2019). More recent evidence has similarly shown that reality therapy can improve psychological capital and its components among adolescents, further supporting the modifiability of this construct through structured psychological intervention (Gholamali Lavasani et al., 2024).

The importance of strengthening psychological capital may be particularly pronounced during adolescence because young people are still developing stable cognitive, motivational, and behavioral strategies for responding to environmental demands. Athletes in this age range routinely encounter situations that challenge persistence and confidence, including competition for team positions, technical errors, critical feedback, performance plateaus, and fluctuations in competitive outcomes. Psychological capital may therefore function as a protective and performance-supportive resource by helping adolescent athletes approach these experiences with greater confidence, goal orientation, persistence, and adaptive expectations. Although psychological capital has been examined in educational, occupational, and clinical settings, comparatively less intervention research has focused directly on adolescent athletes. This gap is noteworthy because evidence from broader psychological intervention research indicates that psychological resources related to resilience and self-control can be strengthened through Reality Therapy-based counseling (Masan Abadi et al., 2015), while multidimensional educational programs can also enhance occupational well-being and positive functioning through systematic skill development (Maarefvand & Shafiabady, 2024). Such findings suggest that structured training programs targeting patterns of thinking, choice, awareness, and behavior may be capable of strengthening psychological resources that are highly relevant to sport.

One potentially useful framework for promoting psychological capital is William Glasser's Choice Theory, which forms the theoretical basis of Reality Therapy. Choice Theory emphasizes personal responsibility, internal control, fulfillment of basic psychological needs, evaluation of current behavior, and the selection of more effective behavioral alternatives. From this perspective, individuals are encouraged to distinguish between what they can and cannot control and to recognize that their own choices play an important role in movement toward personally meaningful goals. This emphasis may be particularly

valuable for adolescent athletes, who often operate in environments where many outcomes are outside their direct control, including refereeing decisions, opponent behavior, team selection, and final competition results. By shifting attention toward controllable actions, effort, preparation, and behavioral choices, Choice Theory-based education may strengthen an athlete's perceived agency and confidence. Previous research has demonstrated the effectiveness of Reality Therapy and Choice Theory-based interventions across diverse psychological outcomes. For example, group Reality Therapy based on Choice Theory has been found to enhance psychological capital among orphaned adolescent girls (Shariati Pour et al., 2019), while Reality Therapy has also been associated with increased psychological capital among preschool teachers (Nasiri et al., 2019) and improved psychological capital among single-parent adolescent girls (Gholamali Lavasani et al., 2024).

The broader evidence base for Choice Theory and Reality Therapy also indicates that these approaches can facilitate adaptive behavioral and psychological change through increased personal responsibility and more effective choice-making. Reality Therapy-based group counseling has been reported to improve self-control and resilience (Masan Abadi et al., 2015), both of which conceptually overlap with the adaptive capacities represented within psychological capital. In another context, Choice Theory Connections demonstrated meaningful psychological and behavioral benefits among incarcerated women, supporting the potential applicability of Choice Theory principles across populations exposed to stress and challenge (Grills et al., 2015). Comparative studies have also indicated that Reality Therapy can produce favorable outcomes when examined alongside mindfulness-based approaches. For example, Reality Therapy and mindfulness-based cognitive therapy have both been shown to improve meaningful psychological and academic outcomes (Asani et al., 2024). Similarly, comparative findings involving Reality Therapy and mindfulness-based cognitive-behavioral interventions have demonstrated improvements in self-efficacy and related positive psychological capacities (Gargari, 2024; Yahyavi Gargari et al., 2024). These findings collectively support the view that Choice Theory-based education may provide a practical framework for strengthening psychological capital by promoting personal responsibility, internal control, realistic self-evaluation, purposeful behavior, and persistence toward desired goals.

Mindfulness represents another increasingly influential approach for strengthening adaptive psychological

functioning. Mindfulness generally refers to intentional, present-focused, and nonjudgmental awareness of ongoing internal and external experiences. Rather than becoming automatically absorbed in thoughts about failure, anticipated outcomes, criticism, or previous mistakes, mindfulness encourages individuals to notice experiences as they occur while maintaining attentional flexibility and behavioral awareness. This orientation may be especially beneficial in sport because athletic performance requires the ability to remain focused on the immediate task while minimizing disruptive attention to previous errors or future consequences. In adolescent football, where performance conditions are dynamic and rapidly changing, mindfulness may support the capacity to remain attentive to present-moment cues, recover efficiently after mistakes, and sustain engagement with current performance demands.

Recent research has increasingly demonstrated meaningful relationships between mindfulness and psychological resources relevant to adaptive functioning. Mindfulness has been associated with psychological capital in student populations, suggesting that mindful awareness may contribute to the development or maintenance of positive psychological resources (Zewude et al., 2024). Further evidence indicates that mindfulness may operate as an important psychological mechanism linking patterns of technology use, social resources, and mental health among adolescents and young people (Zewude et al., 2025). Mindfulness-based interventions have also been shown to influence broader forms of social and psychological functioning in adults exposed to interpersonal stress (Tokhali & Mohammadzadeh Qorbanqoli, 2025). In addition, mindfulness-based cognitive therapy and related interventions have demonstrated favorable effects on positive psychological resources such as affective or emotional capital in clinical and medical populations (Najafi, 2024; Najafi et al., 2024; Salehi-Mobarak et al., 2024). Although these studies differ in population and outcome, they collectively suggest that mindfulness-based approaches can strengthen adaptive psychological resources that may transfer to achievement-oriented settings such as sport.

More directly, evidence concerning psychological capital indicates that mindfulness may contribute to improved functioning partly through its association with positive psychological resources. Long and colleagues found that psychological capital played an important mediating role in the relationship between mindfulness practice and performance-related outcomes, indicating that mindfulness

may support effective functioning by strengthening positive internal resources (Long et al., 2025). Intervention research among adolescents has also shown that mindfulness can improve psychological capital, further supporting its potential relevance to young populations (Shokri et al., 2024). These findings are particularly important for adolescent athletes because mindfulness does not merely aim to reduce distress; it may also facilitate confidence, persistence, adaptive attention, and constructive engagement with challenge. The ability to observe thoughts without automatically reacting to them may help athletes avoid overidentifying with temporary setbacks, while repeated present-moment practice may strengthen their capacity to respond flexibly to demanding sport situations.

The relevance of mindfulness to athletes has been further supported by recent sport-specific research. A systematic review and meta-analysis found that mindfulness interventions can improve cognitive functioning in athletes, highlighting the potential value of mindfulness for attentional and executive processes involved in sport performance (Yang et al., 2025). Among adolescent athletes, mindfulness has also been examined in relation to psychological inflexibility, shame, and sport anxiety, with findings indicating that mindful awareness may contribute to more adaptive responses to evaluative and performance-related experiences (Oliveira et al., 2025). Other athlete-focused studies have found that mindfulness is associated with reduced fear of failure through psychological mechanisms involving perfectionistic tendencies and ego depletion (Z. M. Zhong et al., 2025). Mindfulness has additionally been linked with social evaluation anxiety, self-regulation, and impulsive behavior among athletes, suggesting that greater mindfulness may facilitate more deliberate and adaptive behavioral responding in situations involving interpersonal or competitive pressure (Zhong et al., 2024). Furthermore, mindfulness has been positively associated with athletes' distress tolerance through pathways involving cognitive and mental toughness-related processes (Z. Zhong et al., 2025). Taken together, these findings suggest that mindfulness may be highly relevant to the psychological demands of competitive sport and may provide a promising route for strengthening positive psychological resources among adolescent football players.

The potential usefulness of mindfulness for psychological capital is also consistent with the idea that both constructs involve adaptive engagement with challenge. Whereas psychological capital captures positive resources such as confidence, hope, resilience, and optimism, mindfulness

may provide a process through which individuals regulate attention and maintain flexible awareness in challenging situations. Through regular mindfulness practice, adolescent athletes may learn to disengage from automatic negative evaluations and focus more effectively on current tasks, thereby creating conditions that support persistence, confidence, and adaptive goal pursuit. Research comparing mindfulness-based approaches with other psychological interventions further suggests that mindfulness can produce meaningful changes in positive psychological functioning. Mindfulness-based parenting and Choice Theory-based parenting have both demonstrated effectiveness in psychologically demanding family contexts, although the magnitude and pattern of effects may differ according to intervention mechanisms and outcomes (Babaei Motlaq & Tanha, 2023). Likewise, comparative research involving mindfulness-based cognitive therapy and Reality Therapy has demonstrated that both approaches can improve important indicators of adaptive functioning (Asani et al., 2024; Gargari, 2024; Yahyavi Gargari et al., 2024). These comparative findings raise an important question regarding whether similar differences may emerge when the two approaches are applied to psychological capital among adolescent athletes.

Despite growing evidence supporting both Choice Theory-based and mindfulness-based interventions, direct comparative research in adolescent sport remains limited. Most existing studies have examined these interventions in clinical, educational, occupational, or family populations, and relatively few investigations have compared their effects on a positive psychological resource such as psychological capital among adolescent football players. This represents an important empirical gap because the mechanisms through which the two approaches operate are meaningfully different. Choice Theory emphasizes responsibility, internal control, purposeful choice, needs satisfaction, and evaluation of behavior, whereas mindfulness emphasizes present-focused awareness, attentional control, observation, and nonjudgmental engagement with experience. Both approaches may therefore enhance psychological capital, but they may do so through different psychological pathways. Choice Theory may exert stronger effects through increased agency, self-evaluation, and goal-directed behavior, while mindfulness may operate through improved awareness, attentional stability, and adaptive responses to performance-related thoughts and experiences.

The need for comparative intervention research is further strengthened by evidence that psychological outcomes may

respond differently to these two approaches depending on context and population. Studies comparing Reality Therapy with mindfulness-based cognitive or behavioral interventions have shown that both can be effective, but relative effectiveness may vary across outcomes (Asani et al., 2024; Babaei Motlaq & Tanha, 2023). Similarly, mindfulness-based interventions have demonstrated benefits across psychological capital, affective capital, self-efficacy, and related positive resources (Najafi, 2024; Najafi et al., 2024; Salehi-Mobarak et al., 2024; Shokri et al., 2024), while Choice Theory and Reality Therapy have shown particular promise for psychological capital, resilience, and self-control (Gholamali Lavasani et al., 2024; Masan Abadi et al., 2015; Shariati Pour et al., 2019). More broadly, emerging research has highlighted the importance of strengthening psychological and social resources as protective factors for mental health and adaptive functioning in young populations (Zewude et al., 2025), while sport-specific evidence increasingly identifies mindfulness as relevant to fear of failure, cognitive functioning, distress tolerance, self-regulation, and psychological flexibility among athletes (Oliveira et al., 2025; Yang et al., 2025; Z. Zhong et al., 2025; Zhong et al., 2024; Z. M. Zhong et al., 2025). These converging lines of evidence provide a strong rationale for examining whether Choice Theory-based education and adolescent-centered mindfulness training can enhance psychological capital in adolescent football players and whether one intervention produces greater or more durable effects.

From an applied perspective, identifying effective psychological training programs for adolescent football players may have implications beyond immediate competitive performance. Psychological capital can potentially support sustained sport participation, constructive responses to failure, persistence during skill development, confidence in challenging situations, and adaptive engagement with future goals. Because adolescence is also a formative period for establishing enduring psychological and behavioral patterns, interventions that strengthen positive psychological resources may contribute both to sport development and broader psychosocial functioning. Programs based on Choice Theory and mindfulness are particularly attractive because they can be delivered in structured group formats, taught through experiential exercises, and integrated into educational or sport settings. The development of evidence-based psychological training for adolescent football players may therefore provide coaches, sport psychologists,

counselors, and educational practitioners with practical strategies for supporting young athletes' psychological development alongside technical and physical training.

Accordingly, the aim of the present study was to compare the effectiveness of Choice Theory-based education and adolescent-centered mindfulness training in improving psychological capital among adolescent football players.

2. Methods and Materials

2.1. Study Design and Participants

football players. Participants were recruited through purposive sampling. Announcements describing the research and inviting eligible adolescent football players to participate voluntarily and free of charge were distributed through schools and football training settings in the Shemiranat region. Adolescents who volunteered to participate completed a researcher-developed screening form, and those who satisfied the eligibility criteria were enrolled in the study. The inclusion criteria were being between 12 and 18 years of age, having at least six months of experience in football, participating regularly in football training, obtaining written parental consent to participate in the research, and possessing sufficient physical and psychological readiness to participate in the educational sessions. The exclusion criteria included absence from more than two intervention sessions, the emergence of psychological difficulties severe enough to prevent continued participation, and voluntary withdrawal from the study after enrollment. Eligibility criteria were primarily assessed through self-report responses on the screening form. After eligible participants had been identified, they were randomly assigned through simple random allocation using a lottery procedure to one of three groups: Choice Theory-based education, adolescent-centered mindfulness training, or the control group, with 15 participants in each group. The groups were also considered with respect to age and educational grade to achieve reasonable comparability at baseline. Before the interventions, all three groups completed the Psychological Capital Questionnaire as the pretest. The first experimental group subsequently received Choice Theory-based education, while the second experimental group received adolescent-centered mindfulness training. The control group received no psychological educational intervention during the study period. Immediately after completion of the interventions, the questionnaire was administered again as the posttest, and the same assessment was repeated two months later as the

follow-up measurement. The research procedure was conducted after obtaining the necessary institutional and school-level permissions and written informed consent from the participants' parents. School administrators, football coaches, and relevant personnel were informed of the objectives and procedures of the study before participant recruitment. Participation was voluntary, participants were informed that they could discontinue their involvement at any stage, and the collected information was treated confidentially and used exclusively for research purposes.

2.2. Measures

Psychological capital was assessed using the 26-item Psychological Capital Questionnaire developed by McGee and colleagues and subsequently translated and psychometrically evaluated for use in Iran by Golparvar. The instrument measures psychological capital through four dimensions comprising self-efficacy, hope, resilience, and optimism or positive life orientation. Items are rated on a six-point Likert scale ranging from 1, indicating "strongly disagree," to 6, indicating "strongly agree." Accordingly, the possible total score ranges from 26 to 156, with higher scores indicating a higher level of psychological capital. The self-efficacy subscale consists of Items 1 through 7, the hope subscale includes Items 8 through 14, the resilience subscale comprises Items 15 through 20, and the optimism or life-orientation subscale consists of Items 21 through 26. Scores for each dimension are calculated by summing the responses to the corresponding items, while the overall psychological capital score is obtained from the sum of all four subscale scores. Evidence concerning the psychometric properties of the Persian version has supported its validity and reliability. Face and content validity were evaluated and confirmed by specialists, and exploratory factor analysis with Varimax rotation reproduced the four-factor structure proposed for the original instrument. Reported Cronbach's alpha coefficients for self-efficacy, hope, resilience, and life orientation were 0.88, 0.86, 0.83, and 0.83, respectively, in one psychometric evaluation, while Golparvar and colleagues reported coefficients of 0.91, 0.89, 0.83, and 0.70 for the corresponding dimensions. In the present study, the questionnaire was administered in paper-and-pencil format at the pretest, posttest, and two-month follow-up stages under comparable assessment conditions for all three groups.

2.3. Interventions

The Choice Theory-based educational intervention was derived from the protocol developed by Alizadeh Fard and Tadrizi Tabrizi based on William Glasser's Choice Theory and Reality Therapy framework. The intervention consisted of eight 90-minute group sessions and was implemented twice weekly for the first experimental group. The program was designed to help adolescent football players develop a clearer understanding of personal choice, internal control, basic psychological needs, responsibility, and effective behavioral alternatives. The first session focused on introducing group members, establishing the structure and expectations of the program, and explaining the fundamental concepts of Choice Theory and Reality Therapy. The second session reviewed the initial material and emphasized personal responsibility, the distinction between internal and external control, and the role of internal control in successful functioning, followed by the assignment of relevant exercises. The third session addressed basic psychological needs, identification of participants' dominant needs, and the importance of developing healthy and effective interpersonal relationships. During the fourth session, participants were encouraged to recognize behaviors, thoughts, and feelings associated with attempts to satisfy their needs and were introduced to the concept of the "quality world," with exercises intended to connect personally valued goals to their everyday choices. The fifth session focused on realistic self-evaluation of current behavior and examination of whether existing behavioral choices were effective in satisfying important needs and achieving desired goals. During the sixth session, participants examined the reasons underlying their behavioral choices and identified personal and environmental barriers to behavioral change. The seventh session concentrated on generating and practicing alternative behaviors, identifying more effective courses of action, and making practical choices that could support personal and sport-related goals. The eighth and final session reviewed the skills learned throughout the program, reinforced personal worth and responsibility, consolidated the application of Choice Theory principles in everyday and sport contexts, and concluded the educational program. Homework assignments and review of previous exercises were incorporated throughout the sessions to promote continued practice and transfer of the acquired concepts beyond the intervention setting.

The adolescent-centered mindfulness intervention was based on an integrative approach incorporating principles of Mindfulness-Based Stress Reduction and Mindfulness-Based Cognitive Therapy and was adapted from Burdick's adolescent-centered mindfulness program. The intervention comprised ten 90-minute group sessions administered twice weekly to participants in the second experimental group. The first session introduced the concept and purpose of mindfulness, explained the role of regular practice in daily life, established a plan for mindfulness exercises, and familiarized participants with appropriate postures for mindfulness meditation, including seated, lying, cross-legged, and hand positions, followed by home practice. The second session explored participants' initial experiences with mindfulness and introduced mindful breathing, abdominal breathing, and exercises demonstrating the distinction between a distracted and a calm mind. The third session included review and repetition of mindful breathing and introduced body-scan meditation to increase awareness of bodily sensations. The fourth session reinforced basic breathing exercises, emphasized present-moment awareness through experiential activities such as mindful attention to a glass of water, and introduced mindful movement. The fifth session extended mindfulness practice to sensory experiences through mindful listening, touching, smelling, seeing, and related present-focused exercises, while continuing mindful breathing practice. The sixth session introduced basic relaxation breathing and exercises aimed at observing internal experiences with openness and nonjudgmental awareness, along with reflective note-taking and experiential scenarios designed to distinguish helpful from unhelpful patterns of attention. The seventh session reviewed breathing and body-scan exercises and focused on mindfulness of thoughts through the "flowing river" meditation, in which participants practiced observing thoughts as temporary mental events rather than automatically reacting to them. The eighth session included relaxation breathing, progressive muscle relaxation, and the "changing the channel" exercise to strengthen flexible deployment of attention. The ninth session reinforced breathing meditation, mindful movement, and previously learned observational exercises to consolidate participants' ability to remain attentive to present-moment experience. The tenth and final session reviewed the exercises learned throughout the intervention and introduced the application of mindfulness to ordinary daily activities as well as loving-kindness or compassionate-wishes meditation. Homework was assigned throughout the program to encourage regular

practice between sessions and facilitate the incorporation of mindfulness skills into participants' daily routines and football-related activities.

2.4. Data Analysis

Following completion of data collection, the data were entered into IBM SPSS Statistics version 26 and screened before inferential analysis. Data cleaning procedures included examination for missing values, repetitive or implausible response patterns, inconsistencies among questionnaire responses, and univariate or multivariate outliers when applicable. Descriptive statistics, including means and standard deviations, were calculated to summarize psychological capital scores across the Choice Theory-based education, adolescent-centered mindfulness, and control groups at the pretest, posttest, and two-month follow-up assessments. Appropriate frequency and percentage indices were also used to summarize participants' demographic characteristics. Before conducting the primary inferential analyses, the statistical assumptions required for parametric procedures were evaluated, including the normality of score distributions using the Kolmogorov–Smirnov test, homogeneity of variances using Levene's test, homogeneity of covariance matrices using Box's M test when applicable, and homogeneity of regression slopes for covariance-based comparisons. Because psychological capital comprised several conceptually related dimensions and measurements were obtained repeatedly across three assessment occasions, multivariate covariance-based procedures and repeated-measures analysis of variance were used as appropriate to evaluate changes in psychological capital and its dimensions across the experimental and control conditions over time. The interaction between group and measurement occasion was examined to determine whether changes from pretest to posttest and follow-up differed between the Choice Theory-based education, adolescent-centered mindfulness, and control groups. Where significant omnibus effects were identified, Bonferroni-adjusted pairwise comparisons were conducted to determine the location of significant differences between measurement occasions and study groups and to compare the relative effectiveness of the two educational interventions. Statistical significance was evaluated at an alpha level of 0.05.

3. Findings and Results

All 45 participants were male adolescent football players and were equally distributed among the Choice Theory-

based education group, adolescent-centered mindfulness training group, and control group, with 15 participants in each group. In the Choice Theory group, 5 participants were aged 12–14 years, 8 were aged 15–17 years, and 2 were 18 years old. Regarding football experience, 4 participants had approximately six months of experience, 5 had between six months and one year, 3 had between one and two years, 2 had between two and three years, and 1 had more than three years of experience. Nine participants were enrolled in Grades 7–9 and 6 in Grades 10–12. In the adolescent-centered mindfulness group, 7 participants were aged 12–14 years, 5 were aged 15–17 years, and 3 were 18 years old. Five participants had approximately six months of football experience, 6 had between six months and one year, 1 had between one and two years, 2 had between two and three

years, and 1 had more than three years of experience. Eight participants were enrolled in Grades 7–9 and 7 in Grades 10–12. In the control group, 3 participants were aged 12–14 years, 8 were aged 15–17 years, and 4 were 18 years old. Six participants had approximately six months of football experience, 4 had between six months and one year, 3 had between one and two years, 1 had between two and three years, and 1 had more than three years of experience. Nine participants were enrolled in Grades 7–9 and 6 in Grades 10–12. The chi-square analyses indicated that the three groups did not differ significantly in their demographic characteristics, including age, football experience, and educational grade (all $p > .05$), supporting baseline demographic comparability among the study groups.

Table 1

Descriptive Statistics for Psychological Capital Across the Three Assessment Stages

Group	Pretest M	Pretest SD	Posttest M	Posttest SD	Follow-up M	Follow-up SD
Control	28.07	4.65	28.13	4.60	28.27	4.28
Choice Theory-based education	27.53	5.01	42.20	4.35	41.47	4.42
Adolescent-centered mindfulness	26.80	5.45	36.93	2.71	36.53	3.14

As shown in Table 1, the three groups had relatively similar psychological capital scores at pretest. The control group showed virtually no change across the three assessment stages, with the mean psychological capital score increasing only slightly from 28.07 at pretest to 28.13 at posttest and 28.27 at follow-up. In contrast, the Choice Theory-based education group demonstrated a substantial increase from a pretest mean of 27.53 to 42.20 at posttest, with the improvement largely maintained at the two-month follow-up ($M = 41.47$). The adolescent-centered mindfulness group also showed a marked increase, from 26.80 at pretest to 36.93 at posttest, followed by a nearly stable mean of 36.53 at follow-up. These descriptive findings suggest that both educational interventions were associated with improvements in psychological capital, while the magnitude of improvement was greater in the Choice Theory-based education group. Moreover, the relatively small differences between posttest and follow-up means in both experimental groups indicate that the observed improvements were largely maintained over the two-month follow-up period.

Prior to conducting the repeated-measures analysis of variance, the relevant statistical assumptions were evaluated. The Shapiro–Wilk test showed no significant deviation from normality for psychological capital scores in any of the three

groups at the pretest, posttest, or follow-up stages, with all p values greater than .05. Specifically, the significance values ranged from .097 to .792 across the nine group-by-time combinations, indicating that the assumption of normality was satisfied. Levene's test was also nonsignificant at pretest, $F(2, 42) = 0.248$, $p = .787$, posttest, $F(2, 42) = 0.201$, $p = .819$, and follow-up, $F(2, 42) = 0.243$, $p = .803$, confirming homogeneity of error variances across the three groups. Box's M test was nonsignificant, Box's $M = 12.18$, $F = 1.10$, $p = .114$, indicating that the variance–covariance matrices could be considered homogeneous. Examination of polynomial trends showed significant linear and quadratic changes in psychological capital over time, as well as significant group-by-time trends (all $p < .001$), reflecting the sharp increase from pretest to posttest and the relative stabilization of scores at follow-up. Mauchly's test of sphericity was significant, $W = .183$, approximate $\chi^2(2) = 69.38$, $p < .001$, indicating violation of the sphericity assumption. Therefore, the Greenhouse–Geisser correction was applied, with $\epsilon = .551$. In addition, the multivariate test demonstrated significant effects of time, Wilks' $\Lambda = .197$, $F(2, 41) = 83.48$, $p < .001$, partial $\eta^2 = .803$, and the time $\times$ group interaction, Wilks' $\Lambda = .693$, $F(4, 82) = 11.25$, $p < .001$, partial $\eta^2 = .346$, supporting further interpretation of the repeated-measures model.

Table 2

Repeated-Measures Analysis of Variance for Psychological Capital

Effect	Sum of Squares	df	Mean Square	F	p	Partial η^2
Within-subject effects						
Time	1981.61	1.101	1799.21	154.84	< .001	.787
Time $\times$ Group	1055.54	2.203	479.19	41.24	< .001	.663
Error	537.51	46.26	11.62	—	—	—
Between-subject effects						
Group	1806.41	2	903.21	20.34	< .001	.492
Error	1865.02	42	44.40	—	—	—

The results of the repeated-measures analysis of variance presented in Table 2 revealed a significant main effect of time on psychological capital, $F(1.101, 46.26) = 154.84$, $p < .001$, partial $\eta^2 = .787$. Thus, psychological capital scores changed significantly across the pretest, posttest, and follow-up assessments. The partial eta-squared value indicated a large effect, with approximately 78.7% of the variance associated with within-participant changes over time attributable to the time effect. More importantly, the interaction between time and group was statistically significant, $F(2.203, 46.26) = 41.24$, $p < .001$, partial $\eta^2 = .663$. This finding indicates that the pattern of change in psychological capital differed significantly across the Choice Theory-based education, adolescent-centered

mindfulness, and control groups. Both intervention groups exhibited substantial increases from pretest to posttest that were largely sustained at follow-up, whereas the control group remained comparatively stable. The between-subject effect of group was also significant, $F(2, 42) = 20.34$, $p < .001$, partial $\eta^2 = .492$, demonstrating significant overall differences in psychological capital among the three groups. The effect size indicated that approximately 49.2% of the between-group variance in psychological capital was associated with group membership. Collectively, these findings support the effectiveness of both interventions in increasing psychological capital among adolescent football players and indicate that the magnitude of improvement differed between the two educational approaches.

Table 3

Post-Hoc Comparisons for Psychological Capital

Comparison	Mean Difference	SE	p	95% CI
Between-group comparisons				
Choice Theory vs. adolescent-centered mindfulness	3.64	1.40	.044	—
Choice Theory vs. control	8.91	1.40	< .001	—
Adolescent-centered mindfulness vs. control	5.27	1.40	.002	—
Between-time comparisons				
Pretest vs. posttest	-8.29	0.637	< .001	[-9.88, -6.70]
Pretest vs. follow-up	-7.96	0.647	< .001	[-9.57, -6.34]
Posttest vs. follow-up	0.333	0.166	.154	[-0.081, 0.748]

The post-hoc comparisons presented in Table 3 clarified the location of the significant group and time effects. The Choice Theory-based education group had significantly higher psychological capital scores than the adolescent-centered mindfulness group, $MD = 3.64$, $SE = 1.40$, $p = .044$, indicating that Choice Theory-based education produced a greater overall improvement in psychological capital. The Choice Theory group also scored significantly higher than the control group, $MD = 8.91$, $SE = 1.40$, $p < .001$, while the adolescent-centered mindfulness group scored significantly

higher than the control group, $MD = 5.27$, $SE = 1.40$, $p = .002$. These comparisons demonstrate that both interventions were effective relative to the control condition, with Choice Theory-based education showing the stronger effect. Bonferroni-adjusted comparisons across the assessment stages further showed that psychological capital was significantly higher at posttest than at pretest, $MD = -8.29$, $SE = 0.637$, $p < .001$, 95% CI [-9.88, -6.70], and significantly higher at follow-up than at pretest, $MD = -7.96$, $SE = 0.647$, $p < .001$, 95% CI [-9.57, -6.34]. In contrast, the difference

between posttest and follow-up was not statistically significant, $MD = 0.333$, $SE = 0.166$, $p = .154$, 95% CI [-0.081, 0.748]. The absence of a significant posttest-to-follow-up decline indicates that the improvements in psychological capital achieved following the interventions were maintained over the two-month follow-up period. Overall, the findings confirm that both Choice Theory-based education and adolescent-centered mindfulness training significantly enhanced psychological capital among adolescent football players, while Choice Theory-based education demonstrated significantly greater effectiveness.

4. Discussion

The present study aimed to compare the effectiveness of Choice Theory-based education and adolescent-centered mindfulness training in improving psychological capital among adolescent football players. The findings showed that both interventions significantly increased psychological capital compared with the control condition. Psychological capital scores increased substantially from pretest to posttest in both experimental groups, whereas almost no meaningful change was observed in the control group. These improvements were also maintained at the two-month follow-up, as the difference between posttest and follow-up scores was not statistically significant. Importantly, the findings also revealed a significant difference between the two intervention groups, with Choice Theory-based education producing a greater increase in psychological capital than adolescent-centered mindfulness training. The significant time $\times$ group interaction further demonstrated that changes in psychological capital across the three assessment stages depended on the type of intervention received. Overall, the findings indicate that psychological capital is a modifiable psychological resource in adolescent football players and that structured psychological education can promote its development.

The effectiveness of Choice Theory-based education in increasing psychological capital is consistent with previous studies that have documented the positive effects of Reality Therapy and Choice Theory-based interventions on positive psychological capacities. Shariati Pour and colleagues found that group Reality Therapy based on Choice Theory significantly improved psychological capital among orphaned adolescent girls, suggesting that Choice Theory can strengthen positive psychological resources even in populations exposed to substantial developmental and environmental challenges (Shariati Pour et al., 2019).

Similarly, Gholamali Lavasani and colleagues reported that Reality Therapy significantly increased psychological capital and its components among single-parent adolescent girls (Gholamali Lavasani et al., 2024). The present findings also align with research showing that Reality Therapy can increase psychological capital in educational populations (Nasiri et al., 2019). Taken together, these findings support the assumption that Choice Theory-based education is capable of influencing psychological resources that involve confidence, persistence, positive expectations, and adaptive responses to difficulties.

One possible explanation for the greater effectiveness of Choice Theory-based education lies in its emphasis on personal responsibility, internal control, purposeful choice, and behavioral evaluation. Choice Theory encourages individuals to distinguish between aspects of life that are under personal control and those that cannot be directly changed. For adolescent football players, this distinction may be especially important because competitive sport repeatedly exposes athletes to uncontrollable conditions, including opponents' behavior, refereeing decisions, team selection, coaching decisions, and unpredictable outcomes. By directing attention toward controllable elements such as effort, preparation, behavior, goal setting, and response to setbacks, Choice Theory may increase perceived agency. This enhanced perception of control can strengthen self-efficacy because athletes become more aware of their capacity to influence their own performance through deliberate action. At the same time, the emphasis on planning alternative behaviors and evaluating whether current choices are effective may contribute to hope by encouraging athletes to identify multiple pathways toward desired goals.

Choice Theory-based education may also enhance resilience by teaching adolescents to interpret setbacks as situations requiring evaluation and alternative choices rather than as definitive failures. This interpretation is compatible with previous findings indicating that Reality Therapy can increase resilience and self-control (Masan Abadi et al., 2015). In football, unsuccessful performances, technical mistakes, defeat, criticism, and periods of reduced playing time are common. Athletes who learn to evaluate their behavioral responses and select more useful alternatives may be better positioned to recover after such experiences. This mechanism may explain why participants in the Choice Theory group showed a particularly large improvement in psychological capital. The results are also broadly consistent with the evidence that Choice Theory-based interventions

can support meaningful behavioral and psychological change through increased responsibility and adaptive choice-making (Grills et al., 2015). These processes appear directly relevant to the state-like dimensions of psychological capital.

The significant improvement observed in the adolescent-centered mindfulness group is also supported by previous research. Shokri and colleagues reported that mindfulness intervention significantly increased psychological capital among adolescent girls (Shokri et al., 2024). Zewude and colleagues also found meaningful relationships between mindfulness and psychological capital, supporting the proposition that greater mindful awareness is associated with stronger positive psychological resources (Zewude et al., 2024). In another study, mindfulness was shown to play an important role in associations among social resources, technology-related behavior, and mental health in younger populations (Zewude et al., 2025). Although these studies were conducted in contexts different from adolescent football, they collectively indicate that mindfulness can contribute to the development of psychological capacities relevant to adaptive functioning.

Mindfulness may enhance psychological capital through several interconnected processes. First, present-moment awareness may reduce excessive cognitive involvement with past mistakes or anticipated failure. In sport, an athlete who remains mentally preoccupied with a previous error may show reduced concentration and confidence in subsequent performance. Mindfulness teaches individuals to notice thoughts without automatically becoming absorbed in them, which may facilitate a more adaptive return of attention to current performance demands. Second, repeated mindfulness practice may strengthen psychological flexibility, making it easier for athletes to respond constructively when unexpected events occur. Evidence from adolescent athletes indicates that mindfulness is associated with lower psychological inflexibility and more adaptive functioning in the context of sport anxiety and shame (Oliveira et al., 2025). This is particularly relevant to psychological capital because resilience depends in part on the capacity to adapt when circumstances deviate from expectations.

The present findings are also compatible with recent sport-specific evidence showing that mindfulness can influence psychological processes directly relevant to athletic functioning. Yang and colleagues, in a systematic review and meta-analysis, reported positive effects of mindfulness interventions on athletes' cognitive functioning

(Yang et al., 2025). Cognitive benefits such as improved attention and executive control may indirectly contribute to psychological capital by helping athletes maintain goal-directed behavior under pressure. Zhong and colleagues found that mindfulness was associated with lower fear of failure among athletes through psychological mechanisms involving perfectionism and ego depletion (Z. M. Zhong et al., 2025). Other findings have linked mindfulness with self-regulation and reduced impulsive behavior among athletes (Zhong et al., 2024), as well as greater distress tolerance through cognitive and mental toughness-related pathways (Z. Zhong et al., 2025). These findings provide a plausible basis for understanding why mindfulness training increased psychological capital in the present study. Athletes who become better able to tolerate difficulty, remain focused, and respond less automatically to stressful situations may gradually develop stronger confidence, persistence, resilience, and positive expectations.

The observed effectiveness of mindfulness is further consistent with findings from non-sport populations showing that mindfulness-based approaches can strengthen broader forms of positive psychological functioning. Long and colleagues found that psychological capital played a mediating role in the association between mindfulness practice and work performance, indicating that psychological capital may represent one of the pathways through which mindfulness contributes to effective functioning (Long et al., 2025). Mindfulness-based approaches have also demonstrated favorable effects on positive psychological resources in clinical and health-related contexts (Najafi, 2024; Najafi et al., 2024; Salehi-Mobarak et al., 2024). Although these studies focused on constructs and populations that differ from adolescent athletes, they support the broader theoretical proposition that mindfulness can cultivate adaptive psychological resources rather than merely reduce negative psychological symptoms. Evidence showing beneficial effects of mindfulness-based intervention on mental health and social resources also supports this interpretation (Tokhali & Mohammadzadeh Qorbanqoli, 2025).

A particularly important finding of the present study was that Choice Theory-based education was significantly more effective than adolescent-centered mindfulness training in increasing psychological capital. Comparative evidence in the existing literature indicates that Choice Theory and mindfulness-based approaches can both be effective but may differ in their relative effectiveness depending on the targeted outcome. Studies comparing Reality Therapy with

mindfulness-based approaches have demonstrated improvements in adaptive psychological functioning under both conditions (Asani et al., 2024; Gargari, 2024; Yahyavi Gargari et al., 2024). Similarly, research comparing Choice Theory-based and mindfulness-based parenting has suggested that both approaches can produce meaningful psychological improvements while operating through distinct mechanisms (Babaei Motlaq & Tanha, 2023). The greater effect of Choice Theory in the present study may therefore reflect a closer conceptual correspondence between the mechanisms of Choice Theory and the components of psychological capital.

Specifically, self-efficacy, hope, resilience, and optimism are strongly connected to beliefs about agency, control, goal pursuit, and behavioral persistence. Choice Theory directly addresses these processes by asking individuals to identify their needs, evaluate current behavior, recognize personal choices, and generate alternative strategies for moving toward desired outcomes. Such content may have provided a more direct route to enhancing psychological capital than mindfulness training, whose primary mechanisms involve awareness, attention, acceptance, and observation. Mindfulness may build psychological capital indirectly by creating better cognitive and attentional conditions for adaptive functioning, whereas Choice Theory may more explicitly strengthen beliefs and behaviors associated with goal-directed agency. This distinction may be particularly important during adolescence, when beliefs about personal capability and control are still developing and can be strongly shaped by educational experiences.

The stronger effect of Choice Theory may also reflect the characteristics of the sport context. Football is a highly goal-directed environment in which players continuously receive feedback regarding performance, tactical decisions, technical skills, and team roles. Choice Theory's emphasis on effective choice, realistic self-evaluation, and responsibility may fit naturally with these demands. When athletes are encouraged to ask whether their current behavior is helping them move toward their goals, psychological education becomes directly applicable to training and competition. Such applicability may increase engagement with intervention material and facilitate transfer into sport situations. In contrast, mindfulness exercises may require longer-term practice before their full effects on broader positive psychological resources become evident. Therefore, although mindfulness produced a significant increase in psychological capital, the relatively short intervention and

follow-up periods may have favored the more explicitly goal- and behavior-oriented structure of Choice Theory.

The durability of the intervention effects is another noteworthy result. Psychological capital remained significantly higher at follow-up than at pretest, while there was no significant difference between posttest and the two-month follow-up. This pattern indicates that the improvements achieved through both interventions were largely maintained after formal training ended. Maintenance may be explained by the practical nature of the skills taught in both programs. Choice Theory provided participants with strategies for evaluating their choices, identifying needs, and selecting more effective behaviors, while mindfulness provided repeatable practices such as mindful breathing, body scanning, present-moment attention, and mindful observation. Once learned, these strategies can be used independently in training, competition, school, and everyday life. Repeated application after intervention completion may therefore have helped preserve treatment gains.

The maintenance of improvement also suggests that psychological capital may not only be temporarily increased during intervention but may become reinforced through repeated adaptive experiences. For example, an athlete who uses Choice Theory principles to respond effectively to a difficult training situation may experience increased confidence, which in turn encourages future persistence. Similarly, an athlete who uses mindfulness to remain focused after a mistake may experience successful recovery during play, reinforcing both confidence and resilience. Over time, repeated experiences of effective coping may consolidate positive psychological resources. This interpretation is compatible with the broader intervention literature demonstrating that structured psychological education can contribute to sustained positive functioning (Maarefvand & Shafiabady, 2024). It is also consistent with research suggesting that both mindfulness and Reality Therapy can produce meaningful changes across a range of adaptive psychological outcomes (Asani et al., 2024).

The significant group effect and large effect sizes observed in the present study further indicate that the interventions were not associated merely with small statistical changes but with substantial differences in psychological capital. The absence of comparable change in the control group strengthens the interpretation that the increases were associated with the educational programs rather than simple passage of time or repeated questionnaire administration. This has particular relevance for adolescent sport psychology because psychological capital may serve

as a foundation for persistence, coping, confidence, and sustained engagement in competitive sport. Interventions capable of enhancing this resource may therefore have value not only for psychological well-being but potentially for broader sport development.

5. Conclusion

Overall, the findings extend previous research by demonstrating that both Choice Theory-based education and adolescent-centered mindfulness training can effectively increase psychological capital in adolescent football players, while Choice Theory-based education appears to produce a greater improvement. The findings are consistent with previous evidence supporting Choice Theory and Reality Therapy for enhancing psychological capital, resilience, self-control, and self-efficacy (Gholamali Lavasani et al., 2024; Masan Abadi et al., 2015; Nasiri et al., 2019; Shariati Pour et al., 2019), as well as research supporting mindfulness for improving psychological capital and sport-relevant psychological functioning (Long et al., 2025; Oliveira et al., 2025; Shokri et al., 2024; Yang et al., 2025; Z. Zhong et al., 2025; Zhong et al., 2024; Z. M. Zhong et al., 2025). The present study therefore contributes to the growing evidence that positive psychological resources among adolescent athletes can be deliberately strengthened through structured psychological education.

6. Limitations & Suggestions

Several limitations should be considered when interpreting the findings. First, the sample consisted of only 45 male adolescent football players from a specific geographical area, which limits the generalizability of the findings to female athletes, athletes from other regions, different competitive levels, and participants in other sports. Second, psychological capital was assessed using a self-report questionnaire, and the findings may therefore have been influenced by response tendencies, social desirability, or participants' subjective interpretation of questionnaire items. Third, although random assignment was used after participant recruitment, the initial sampling procedure was purposive, which may have resulted in a sample composed of adolescents who were particularly motivated to participate in psychological training. Fourth, the follow-up period was limited to two months, making it impossible to determine whether the observed improvements persist over longer periods. Finally, the two interventions differed in the number of sessions, with the Choice Theory program

consisting of eight sessions and the mindfulness program consisting of ten sessions, which should be taken into account when directly comparing their effects.

Future studies should replicate the present research using larger and more heterogeneous samples that include female adolescent football players, athletes from different regions, and participants from both recreational and elite competitive settings. Researchers should also examine the effectiveness of these interventions in other team and individual sports to determine whether their effects are sport-specific or broadly applicable to adolescent athletes. Longer follow-up periods, such as six months or one year, are recommended to evaluate the long-term stability of improvements in psychological capital. Future investigations may also examine each component of psychological capital separately to determine whether Choice Theory and mindfulness produce different patterns of change in self-efficacy, hope, resilience, and optimism. The use of behavioral, coach-rated, and performance-based outcomes alongside self-report instruments would further strengthen future research. In addition, studies could employ intervention programs matched for the number and duration of sessions to provide an even more rigorous comparison of relative effectiveness. Examining potential mediating mechanisms may also clarify whether changes in perceived control, goal orientation, attentional control, psychological flexibility, or related processes explain improvements in psychological capital.

The findings support the integration of structured psychological education into adolescent football development programs. Sport psychologists, counselors, coaches, and football academies may use Choice Theory-based education to help young players develop greater personal responsibility, identify controllable aspects of performance, evaluate ineffective behavioral patterns, and select more constructive responses to setbacks and competitive demands. Adolescent-centered mindfulness exercises can also be incorporated into regular training through brief breathing practices, body-awareness exercises, mindful movement, and present-focused attention before or after training sessions and competitions. Because both interventions produced lasting improvements, practitioners may consider including psychological skills training as a routine component of athlete development rather than using it only when problems arise. Where the primary objective is specifically to strengthen psychological capital, the present findings suggest that Choice Theory-based education may be particularly useful, although mindfulness can serve as a valuable complementary approach. Coaches should also be

trained to reinforce the principles taught in these programs so that athletes encounter consistent messages regarding responsibility, attention, persistence, adaptive coping, and constructive responses to mistakes throughout their sport environment.

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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

All authors equally contributed to this article.

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