ISSN: 2476-5279; International Journal of Musculoskeletal Pain Prevention. 2025;10(4):1324- 1332

Presentation of a Causal Model of Athletic Success Based on Positive Psychological Experiences and Achievement Motivation with the Mediating Role of Self-Esteem in Student Athletes

ARTICLEINFO

Article Type
Original Article

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How to cite this article

Jalili shishavan A, Presentation of a Causal Model of Athletic Success Based on Positive Psychological Experiences and Achievement Motivation with the Mediating Role of Self-Esteem in Student Athletes. Int J. Musculoskelet. Pain. Prev. 2025;10(4): 1324-1332.

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10.48311/ijmpp.2025.116839.82902

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Article History
Received: Oct 28, 2025
Accepted: Dec 21, 2025
ePublished: Dec 25, 2025

ABSTRACT

Aims: The objective was to construct a causal model to investigate the direct and indirect effects of positive psychological experiences and achievement motivation on athletic success, with self-esteem serving as a mediating factor, among elite student athletes

Method and Materials: A sample of 230 elite student athletes was selected through random sampling. Data were collected using the Positive Psychological States Questionnaire. Eysenck's Self-Esteem Inventory. the Athletic Success Questionnaire. Data analysis was performed using SPSS and AMOS software, incorporating both descriptive and inferential statistical methods.

Findings: The proposed model exhibited a good fit. Positive psychological experiences and achievement motivation showed both direct and indirect (through self-esteem) positive and significant effects on athletic success. Self-esteem played a critical mediating role in enhancing the relationship between positive psychological experiences, achievement motivation, and athletic success.

Conclusion: The findings highlight the significance of fostering positive psychological factors and self-esteem to enhance athletic success. These results provide a foundation for designing psychological interventions and educational programs for coaches and athletes to optimize performance.

Keywords: Athletic Success, Motivation, Positive Psychological States, Self-esteem

Introduction

In today's competitive sports world, the success of elite athletes depends not only on physical fitness and technical skills but also on psychological factors that play a critical role in achieving superior performance [1]. Positive psychology, as a branch of psychology that focuses on enhancing strengths, well-being, and positive experiences [2], alongside achievement motivation, which reflects an individual's drive to pursue challenging goals and excel [3], can provide effective theoretical and practical frameworks for explaining athletic success. Self-esteem, as a mediating factor, can moderate these relationships and enhance the impact of positive psychological experiences and achievement motivation on athletic success [4]. This is particularly significant for elite student athletes who face the dual pressures of academic and athletic demands. [5] This study aims to present a causal model to investigate the impact of positive psychological experiences and achievement motivation on athletic success, mediated by self-esteem, among elite student athletes. The significance of this study lies in the fact that a precise understanding of psychological factors can contribute to improving performance, enhancing well-being, and better managing stress in this group [6].

Positive psychology in sports emphasizes fostering positive experiences such as enjoyment, satisfaction, optimism, and a sense of control, which directly and indirectly influence athletic performance. In a previous [7], study focusing on the mental toughness of elite athletes, showed that athletes with high scores in

self-esteem and achievement motivation demonstrated greater ability to maintain focus and respond to coaching. These findings highlight the critical role of positive experiences in fostering a competitive mindset and psychological resilience. Similarly, a previous study [8] emphasized a hierarchical model of achievement motivation, demonstrating that achievement motivation serves as a precursor to achievement goals and enhances athletic success by increasing perseverance and resilience. In these models, self-esteem emerges as a mediating factor, where positive psychological experiences, such as a sense of accomplishment and enjoyment, bolster self-esteem, ultimately leading to better performance.

In the context of student athletes, an existent research [9] showed that participation in university sports is associated with increased self-esteem, logical thinking, and a better understanding of oneself. These factors, through the mediation of self-esteem, enhance athletic success. Moreover, self-efficacy which often overlaps with self-esteem, has been recognized as a strong predictor of athletic success. Other study [10] demonstrated that high self-efficacy encourages elite athletes to exert greater effort and embrace bigger challenges, aligning with causal models based on positive psychology. These models indicate that positive psychological experiences and achievement motivation predict athletic success through the reinforcement of self-esteem.

However, there are gaps in the research literature. For instance, Silva et al [11] showed that high achievement motivation is associated with optimal performance, but the mediating role of self-esteem in elite student athletes has been underexplored. Additionally, Li et al [12] emphasized the impact of psychological capital on success orientation in sports, demonstrating that self-esteem and achievement motivation can enhance well-being and athletic success. This study aims to address these gaps by presenting a causal model focusing on elite student athletes, where the combination of academic and elite athletic demands creates unique challenges, including stress management, balancing academic and athletic commitments, and maintaining motivation in competitive environments.

Sports, as a multifaceted activity, impact not only physical health but also mental health and overall well-being. Numerous studies have shown that sports activities can improve mood, reduce stress, enhance self-esteem, and foster a sense of life satisfaction. For example, one study [13] demonstrated that regular exercise is associated with reduced cortisol levels (the stress hormone) and improved anxiety symptoms. Similarly, other study [14] showed that regular exercise is linked to increased self-esteem and improved body image. These findings underscore the importance of psychological factors in athletic success and suggest that self-esteem can serve as a bridge between positive experiences and athletic performance.

Achievement motivation is also a key concept in sports psychology, referring to an individual's drive to achieve success and avoid failure. According to an existed study, [15] goal-setting theory, setting specific and challenging goals can enhance athletes' motivation and lead to improved performance. Additionally, Deci and Ryan's [16] self-determination theory emphasizes the importance of intrinsic motivation, stating that athletes who find sports activities enjoyable and meaningful exhibit better performance. In this regard, Willmott et al [17] demonstrated that athletes with high intrinsic motivation experience greater perseverance, satisfaction, and athletic success.

Self-esteem, as a mediating variable, plays a significant role in moderating the relationship between positive psychological experiences, achievement motivation, and athletic success. According to Bandura's [18] self-efficacy theory, individuals with high confidence in their abilities exert greater effort in facing challenges and demonstrate better performance. In sports, athletes with high self-esteem are better equipped to manage psychological and competitive pressures, increasing their likelihood of success in competitions. Moritz et al [19] showed that self-efficacy, which is closely related to self-esteem, is a strong predictor of athletic

performance.

This study, focusing on elite student athletes, seeks to develop a structural model to examine the impact of positive psychological experiences and achievement motivation on athletic success, mediated by self-esteem. The results of this study can provide a foundation for designing psychological interventions, such as programs based on positive psychology, to enhance motivation and self-esteem, ultimately improving athletic success. Furthermore, given the role of sports in personal and social development, understanding these causal relationships can assist educational policymakers and coaches in designing effective support programs for elite student athletes. These programs may include workshops to enhance psychological skills, coaching sessions to boost motivation, and stress management strategies. Ultimately, this study seeks to answer the question: Is there a relationship between athletic success and positive psychological experiences and achievement motivation, mediated by self-esteem?

Method and Materials

This study was conducted as a descriptive-correlational research using a structural equation modeling approach. The statistical population consisted of elite student athletes aged 18 to 30 years from Tabriz, from which 230 individuals were selected using random sampling. Data were collected using the following questionnaires: Positive Psychological States Questionnaire by Rajaei et al [20]: This questionnaire comprises 96 items, scored on a Likert scale from 1 to 5 (from "strongly disagree" to "strongly agree"), where "strongly disagree" is scored as 1, "disagree" as 2, "neutral" as 3, "agree" as 4, and "strongly agree" as 5. The Cronbach's alpha coefficient for the entire test was calculated as 0.837, indicating high reliability.

Eysenck's Self-Esteem Inventory [21]: This questionnaire includes 30 items assessing general personality traits related to emotional stability versus instability. Higher scores indicate higher self-esteem. Hermzinejad [22] reported validity coefficients of 0.74 for female students and 0.79 for male students. The reliability coefficient, calculated using Cronbach's alpha, was 0.77, and using the split-half method, it was 0.87. The face and content validity of the questionnaire were confirmed by 10 sports management professors. The reliability of the questionnaire was also verified using Cronbach's alpha, with a coefficient of 0.83 for self-esteem, which is considered acceptable. The scoring for this questionnaire is as follows:

For questions 1, 2, 5, 9, 10, 11, 16, 22, 23, 29, and 30, the "Yes" option receives 1 point, and the "No" option receives 0 points. For questions 3, 4, 6, 7, 8, 12, 13, 14, 15, 17, 18, 19, 20, 21, 24, 25, 26, 27, and 28, the "No" option receives 1 point, and the "Yes" option receives 0 points.

Athletic Success Questionnaire by Mousavi and Vaez [23]: This questionnaire designed in a previous study [23] and was used to assess athletic success. It consists of 29 items covering dimensions such as flow, attention, technique, sensitivity to errors, commitment, and progress. The scoring is based on a five-point Likert scale. In Mousavi and Vaez Mousavi's [23] study, the face and content validity were assessed and confirmed by experts and professors. The reliability was calculated using Cronbach's alpha, with coefficients above 0.89 for all dimensions. In this study, the Cronbach's alpha coefficient was 0.87.

Hermans' Achievement Motivation Scale [24]: This questionnaire includes 29 items based on ten characteristics distinguishing individuals with high achievement motivation from those with low achievement motivation. Hermans [24] used Cronbach's alpha to calculate the reliability of the academic achievement motivation test, obtaining a reliability coefficient of 0.84.

Data analysis was conducted at both descriptive and inferential levels using SPSS-26 and AMOS-24 software. Ethical research principles, including informed consent and data confidentiality, were adhered to.

Findings

This study aimed to develop and test a causal model of athletic success among elite student athletes, based on positive psychological

experiences and achievement motivation, with self-esteem as a mediating factor. Data were analyzed using SPSS and AMOS software at both descriptive and inferential levels. The results, derived from statistical analyses, include descriptive statistics, normality assessments, multicollinearity checks, correlation analysis, and structural equation modeling.

The demographic characteristics of the sample (230 participants) are summarized in Table 1. The sample comprised 133 male (58%of participants) and 97female (42% of participants) elite student athletes. The majority of participants were aged 21–23 years (45%, 103 participants), with the most common athletic experience ranging from 5 to 8 years (40%, 92 participants))

Table 1) Description of demographic characteristics with frequency and percentage (n = 230)

Variable	Category	Number	Percentage
Gender	Male	133	58%
	Female	97	42%
Age	18–20 years	78	34%
	21–23 years	103	45%
	24–26 years	39	17%
	27–29 years	10	4%
Athletic Experience (Years)	1–4	55	24%
	5–8	92	40%
	9–12	67	29%
	13–14	16	7%

Table 2 presents the descriptive statistics for the main variables. The mean and standard deviation for each variable are as follows: positive psychological experiences (mean = 361.99, SD = 2.26), achievement motivation (mean = 90.46, SD = 1.16), self-esteem (mean = 23.63, SD = 0.34), and athletic success (mean = 93.68, SD = 9.56).

Table 2) Descriptive Statistics of Main Variables

Variable	Mean	Standard Deviation
Positive Psychological Experiences	361.99	2.26
Achievement Motivation	90.46	1.16
Self-Esteem	24.43	1.22
Athletic Success	93.68	9.56

To ensure the suitability of parametric tests, skewness and kurtosis were evaluated to assess data normality (Table 3). All variables exhibited skewness and kurtosis values within the acceptable range of -2 to +2 (George & Mallery, 2010), indicating normal or near-normal distribution. Specifically, positive psychological experiences (skewness = 0.122, kurtosis = -1.029), achievement motivation (skewness = 0.115, kurtosis = -1.53), self-esteem (skewness = 0.086, kurtosis = -1.36), and athletic success (skewness = 0.030, kurtosis = -1.24) met the normality criteria.

Table 3) Skewness and Kurtosis Values for Normality Assessment

Variable	Skewness	Kurtosis
Positive Psychological Experiences	0.122	-1.029
Achievement Motivation	0.115	-1.53
Self-Esteem	0.086	-1.36
Athletic Success	0.030	-1.24

Multicollinearity was assessed using the Variance Inflation Factor (VIF) and tolerance values (Table 4). All VIF values were below the threshold of 2 (positive psychological experiences: VIF = 1.147, tolerance = 0.87; achievement motivation: VIF = 1.075, tolerance = 0.93; self-esteem: VIF = 1.22, tolerance = 0.819), indicating no significant

multicollinearity among the predictor variables.

Table 4) Assessment of Multicollinearity Using Variance Inflation Factor (VIF)

Variable (Dependent: Athletic Success)	VIF	Tolerance
Positive Psychological Experiences	1.147	0.87
Achievement Motivation	1.075	0.93
Self-Esteem	1.22	0.819

The Pearson correlation matrix (Table 5) revealed significant positive correlations between all variables at a 99% confidence level ($p < 0.01$). Specifically, positive psychological experiences were positively correlated with achievement motivation ($r = 0.412$), self-esteem ($r = 0.519$), and athletic success ($r = 0.475$). Achievement motivation was positively correlated with self-esteem ($r = 0.303$) and athletic success ($r = 0.476$). Self-esteem showed a strong positive correlation with athletic success ($r = 0.606$). These findings support the hypothesized relationships in the study

Table 5) Correlation Matrix of Variables

	PPS	AMT	SE	SUCC
PPS	1			
AMT	.412**	1		
SE	.519**	.303**	1	
SUCC	.475**	.476**	.606**	1
Note: **Correlation significant at the 0.01 level.				
PPS: Positive Psychological States, AMT: Achievement Motivation, SE: Self-Esteem, SUCC: Athletic Success				

The proposed model was tested using path analysis in AMOS, with results summarized in Tables 6, 7, 8, and 9. The regression coefficients for the mediating variable (self-esteem) and the dependent variable (athletic success) are presented in Table 6. The standardized regression coefficient for self-esteem was significant ($\beta = 0.457$, $t = 8.024$, $p < 0.001$), indicating a strong relationship with athletic success.

Table 6) Regression Coefficients for Mediating and Dependent Variables

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	
Self-Esteem	0.389	0.049	0.457	8.024

The model fit indices are reported in Table 7. The model demonstrated a good fit, with a chi-square to degrees of freedom ratio ($\chi^2/df = 2.39$, $p = 0.122$), Root Mean Square Error of Approximation (RMSEA = 0.07), Incremental Fit Index (IFI = 0.98), Comparative Fit Index (CFI = 0.98), Goodness of Fit Index (GFI = 0.99), and Adjusted Goodness of Fit Index (AGFI = 0.95). These indices confirm that the proposed model is well-aligned with the observed data.

The theoretical model was tested using path analysis techniques in AMOS software. Figure 1 illustrates the empirical model with standardized coefficients for the sample. It should be noted that the presented empirical model is a revised model, and all relationships depicted in Figure 1 are statistically significant.

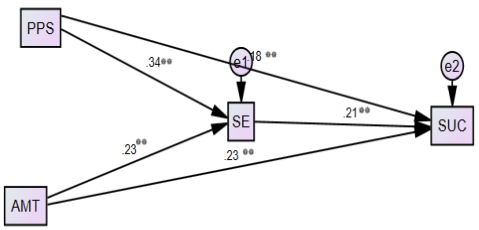

Figure 1) The empirical research model in the sample with standardized path coefficients, where PPS represents Positive Psychological Experiences, AMT represents Achievement Motivation, SE represents Self-Esteem, and SUC represents Athletic Success

The model fit indices are presented in Table 7.

After estimating the model parameters, the question arises as to how well the proposed model aligns with the relevant data. This question can only be answered by evaluating the model's fit. According to the data in Table 7, the model demonstrates a good fit.

Table 7) Research Model Fit Indices

Indices	χ^2/d.f	P	GFI	AGFI	CFI	IFI	RMSEA
Values	2.39	0.122	0.99	0.95	0.98	0.98	0.07

Direct Effects Table 8 presents the direct effects of the predictor and mediating variables on athletic success. Positive psychological experiences had a significant direct effect on self-esteem (β = 0.337, p < 0.001) and athletic success (β = 0.177, p = 0.007). Achievement motivation also showed significant direct effects on self-esteem (β = 0.232, p < 0.001) and athletic success (β = 0.227, p < 0.001). Self-esteem had a significant direct effect on athletic success (β = 0.208, p = 0.002). All direct effects were positive and significant at the p < 0.01 level.

Table 8) Direct Effects from the Model Test

Effect Type	Standardized Coefficient	p-value
Positive Psychological Experiences → Self-Esteem	0.337	0.001
Achievement Motivation → Self-Esteem	0.232	0.001
Positive Psychological Experiences → Athletic Success	0.177	0.007
Achievement Motivation → Athletic Success	0.227	0.001
Self-Esteem → Athletic Success	0.208	0.002

Indirect Effects The indirect effects, mediated by self-esteem, are summarized in Table 9. Positive psychological experiences had a significant indirect effect on athletic success through self-esteem (β = 0.07, p < 0.001). Similarly, achievement motivation had a significant indirect effect on athletic success through self-esteem (β = 0.048, p < 0.001). These findings highlight the mediating role of self-esteem in the relationship between positive psychological experiences, achievement motivation, and athletic success.

Table 9) Indirect Effects from the Model Test

Predictor	Mediator	Criterion	β	P
Positive Psychological Experiences	Self-Esteem	Athletic Success	0.07	0.001
Achievement Motivation	Self-Esteem	Athletic Success	0.048	0.001

Discussion

The findings of this study confirm the proposed structural model, demonstrating that positive psychological experiences and achievement motivation significantly predict athletic success among elite student athletes, with self-esteem serving as a key mediator. The model's excellent fit, with indices such as χ^2/df = 2.39, RMSEA = 0.07, IFI = 0.98, CFI = 0.98, GFI = 0.99, and AGFI = 0.95, aligns with previous research, including [25], [26], and [27], which emphasize the interconnected role of psychological variables in athletic performance. These results are consistent with the systemic theory of athletic behavior [28], which posits that psychological constructs such as motivation, self-esteem, and positive states interact within an integrated system to influence performance.

The results confirmed the robust fit of the causal model, indicating that positive psychological experiences and achievement motivation enhance athletic success both directly and indirectly through self-esteem. This finding aligns with Bandura's [18] self-efficacy theory, which identifies self-esteem (akin to self-efficacy) as a central mediator in amplifying the effects of motivation and positive states on performance. Similarly, Seligman's [29] positive psychology framework

underscores the role of positive states such as optimism and hope in enhancing resilience and focus, as observed in the direct and indirect paths of this study's model.

The direct effect of positive psychological experiences on athletic success was confirmed ($\beta = 0.177$, $p = 0.007$). This result is consistent with studies by[30], [31], [32], which show that positive emotions such as joy, satisfaction, and flow increase intrinsic motivation, reduce competitive stress, and improve focus, ultimately leading to better performance. These mechanisms—stress reduction, improved focus, and increased resilience—have been supported by[33] and [34], who highlight the role of positive psychological states in mitigating anxiety and optimizing performance under pressure.

The direct effect of achievement motivation on athletic success was also confirmed ($\beta = 0.227$, $p < 0.001$), indicating a moderate but significant impact. This finding aligns with McClelland and Atkinson's achievement motivation theory, which suggests that individuals with high motivation gravitate toward moderately challenging tasks, leading to persistent effort and goal-oriented behavior. Studies by Conroy et al [35] and Nicholls' [36] achievement goal theory further support this, indicating that mastery-oriented motivation fosters sustained effort and adaptability while reducing competitive anxiety. Additionally, Deci and Ryan's [16] self-determination theory links intrinsic motivation to psychological needs (autonomy, competence, and relatedness), which were reflected in the sustained commitment and reduced burnout observed in this study.

The direct effect of self-esteem on athletic success was confirmed ($\beta = 0.208$, $p = 0.002$), aligning with Bandura's self-efficacy theory and Deci and Ryan's self-determination framework. This result is consistent with findings from [37] and [38]. High self-esteem enables athletes to select effective strategies, persist under pressure, and maintain focus, as demonstrated by [39]. Fredrickson's [40] broaden-and-build theory further explains how positive emotions stemming from self-esteem expand cognitive and attentional resources and reduce stress, contributing to improved performance.

The study also confirmed the indirect effects of positive psychological experiences ($\beta = 0.07$, $p < 0.001$) and achievement motivation ($\beta = 0.048$, $p < 0.001$) on athletic success through self-esteem. These findings align with Bandura's [18] social-cognitive theory, which positions self-efficacy as a primary mediator of performance, and Fredrickson's [40] theory, which suggests that positive states build enduring resources like self-esteem. The mediating role of self-esteem is further supported by [41] and [42], who identify self-esteem as a key predictor of athletic success in high-pressure conditions.

Ultimately, the study confirmed the mediating role of self-esteem in the relationship between positive psychological experiences, achievement motivation, and athletic success. This mediation is explained through a reinforcing cycle in which positive experiences and motivation enhance self-esteem, leading to greater effort, focus, and resilience, thereby improving performance [43]. This mechanism is particularly pronounced in elite athletes, where self-esteem acts as a buffer against competitive anxiety and sustains motivation[44-45].

Conclusion

This study provides robust evidence for the critical role of positive psychological experiences and achievement motivation in predicting athletic success among elite student athletes, with self-esteem as a central mediator. The model's excellent fit and significant direct and indirect effects underscore the importance of psychological factors in enhancing athletic performance. These findings enrich the sports psychology literature and offer practical implications for coaches, educators, and policymakers. By fostering positive psychological states and self-esteem through targeted interventions—such as mindfulness training, goal-setting workshops, and psychological support programs—athletes' resilience, focus, and performance can be enhanced. Despite these contributions, the study faces limitations, including its focus on elite athletes from a single region, reliance on self-report

measures, and cross-sectional design, which limit generalizability and causal inference. Future research should employ longitudinal designs, more diverse samples, and additional mediators (e.g., social support) to gain a deeper understanding of the psychological mechanisms underlying athletic success.

Acknowledgments
We are grateful to all the people who have accompanied us in this research.

Authors' Contribution
All authors were involved in designing and conducting the study. The manuscript was read and confirmed by all authors
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Conflicts of Interest
There are no conflicts of interest.

Ethical Permission
This study was conducted as a descriptive-correlational research using a structural equation modeling approach. All ethical points were considered into the study. Informed consent were filled by all participants.

Funding
This research has not received any financial support.

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