OPEN ACCESS
Advances in Health and Exercise

ORIGINAL RESEARCH

Investigating the effect of regular training participation on self-efficacy and perceived success in male basketball players aged 11-15

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Received:
February 03, 2025

Accepted:
March 24, 2026

Online Published:
March 27, 2026

Keywords:
Basketball, early adolescence, perception of success, self-efficacy, regular training.

Abstract

Aim: The purpose of this study was to examine the effects of regular basketball training participation on the self-efficacy and perceived success of male basketball players aged 11-15 years. **Method:** The research was conducted using a pre-test-post-test control group experimental design. The study group consisted of a total of 109 male athletes: an experimental group (n=53) that participated in regular basketball training and a control group (n=56) that did not systematically participate in sporting activities. The Self-Efficacy Scale and the Perception of Success in Sport Questionnaire were used as data collection tools. A mixed-method analysis of variance, including group (experimental-control) and time (pre-test-post-test) factors, was applied to the data, and effect sizes were reported. **Results:** The findings revealed that the self-efficacy scores of the athletes in the experimental group increased significantly in the post-test, whereas their perceived success scores decreased significantly ($p<.05$). In the control group, no significant change was found in either variable ($p>.05$). Effect size analyses showed that the group variable had a small effect on self-efficacy, whereas the time variable, especially the group × time interaction, had moderate-to-high effects. **Conclusion:** The results indicate that regular training practices have multidimensional, not unidirectional, effects on the psychological structures of young athletes. The increase in self-efficacy suggests that the training process strengthens beliefs about competence, whereas the decrease in perceived success can be explained not by a motivational decline but rather, by increased performance awareness and the restructuring of success measures in early adolescence. These findings highlight the importance of a developmental and contextual approach in assessing the psychological development of young athletes.

Introduction

Early adolescence, typically defined as the 11-15 age range, represents a critical developmental period characterized by rapid physical, cognitive, and emotional changes. During this stage, individuals' self-perceptions, identity formation, and value systems undergo significant restructuring (Steinberg, 2017; Papalia & Feldman, 2021). Alongside biological maturation, young people increasingly evaluate themselves, redefine success, and reassess the criteria by which they judge their competence. Consequently, early adolescence constitutes a sensitive developmental context in which psychological structures are reorganized.

Within this developmental process, sport provides an important environmental context that supports not only physical development but also psychological and social adjustment. Sporting environments function as learning settings in which athletes develop self-efficacy beliefs, perceptions of success, self-regulation skills, and social identities (Weiss & Wiese-Bjornstal, 2009). In particular, regular and structured training processes allow young athletes to engage in goal setting, effort regulation, feedback processing, and performance evaluation, all of which are central psychological skills in sport (Alkasasbeh & Akroush, 2025; Martín-Rodríguez et al., 2024; Zimmerman, 2000).

Self-efficacy is widely recognized in sports psychology as a key determinant of motivation, persistence, and psychological well-being (Bandura, 1997; Feltz et al., 2008). Defined as an individual's belief in their ability to successfully perform a specific task, self-efficacy guides athletes' thoughts, emotions, and behaviors in performance settings (Bandura, 1977, 1997). Research consistently shows that athletes with higher self-efficacy demonstrate greater persistence, maintain motivation under challenging conditions, and

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To Cite: Hamamioğlu, Ö., & Erkmen Hadi, G. (2026). Investigating the effect of regular training participation on self-efficacy and perceived success in male basketball players aged 11-15. *Adv Health Exerc*, 6(1), 47-56.

evaluate their performance more positively (Moritz et al., 2000; Feltz & Lirgg, 2001).

Another central construct influencing psychological adjustment in sport is the perception of success, which reflects how individuals define and evaluate successful performance (Nicholls, 1984; Duda, 1992). According to Achievement Goal Theory, success can be evaluated through task-oriented criteria, emphasizing learning and effort, or ego-oriented criteria, emphasizing social comparison and superiority (Nicholls, 1984). Task-oriented success perceptions are associated with adaptive outcomes such as intrinsic motivation and commitment, whereas ego-oriented perceptions are more closely linked to performance pressure and anxiety (Duda, 2001; Roberts et al., 2007).

During early adolescence, advances in cognitive development enable athletes to evaluate their abilities more critically and realistically (Horn, 2004). In this period, regular training may simultaneously strengthen self-efficacy while reshaping perceptions of success. As technical awareness and performance standards increase, athletes may adopt more demanding criteria for defining success. Such changes reflect a developmental and contextual reorganization rather than a decline in motivation.

Basketball provides a particularly suitable context for examining these processes due to its team structure, continuous performance feedback, and emphasis on both individual and collective outcomes (Kostopoulos et al., 2024). Through training and competition, young basketball players gain experiences that shape their self-perceptions, including skill development, coach feedback, and contributions to team goals (DiFiori et al., 2018; Fraser-Thomas et al., 2005). These experiences may encourage athletes to evaluate success not only in terms of outcomes but also in relation to learning and development.

Despite the importance of these constructs, relatively few studies have examined self-efficacy and perceptions of success in early adolescent basketball players using control group and pre-test–post-test designs. Therefore, the present study aims to investigate the effects of regular training participation on self-efficacy and perceptions of achievement in male basketball players aged 11–15, considering both group (experimental–control) and time (pre-test–post-test) factors. By adopting a developmental and contextual perspective, this study seeks to contribute to a clearer understanding of psychological adjustment processes in young athletes. The study aims to reveal the direction and magnitude of possible differences in these psychological variables; thus, it aims to contribute to a more holistic and developmental evaluation of young athletes' psychological development.

The research questions and hypotheses are as follows: This study examines whether regular training leads to significant pre-test–post-test changes in self-efficacy and perceived achievement among 11-15-years-old male basketball players compared with a control group. *H1*: Self-efficacy and perceived achievement scores differ significantly as a function of the group (experimental–control) × time (pre-test–post-test) interaction. *H2*: Regular training practices exert a significant effect size on self-efficacy and perceived achievement scores.

Methods

This study used a pre-test-post-test control group comparison model, a quantitative research method.

Participants

The study population consisted of male basketball players aged 11-15 years. Purposive sampling, a non-random technique suitable when randomization is not feasible, was used to determine the sample (Etikan et al., 2016). Sample size estimation using G*Power 3.1 indicated that at least 30 participants were required for both the experimental and control groups. Accordingly, the experimental group comprised 53 male basketball players aged 11–15 from Konya Armada Sports Club, while the control group included 56 physically active peers who were not affiliated with any sports club. In total, 109 participants (mean age = 13.44 ± 1.09) took part in the study. Descriptive information regarding the study groups is presented in Table 1.

As shown in Table 1, the male participants in the study group showed similarities in terms of their parents' educational levels. Furthermore, the average monthly income of the experimental (mean = 68075.05 ± 41320.60) and control (mean = 67190.55, ± 49781.87) groups was approximately the same. Regarding grade point averages, the experimental (mean = 92.20, ± 8.02) and control (mean = 90.11, ± 10.32) groups also had similar averages. In terms of these values as well, the experimental and control groups showed similarities.

Measurements

As data collection tools, a personal information form prepared by the researcher, the Perception of Success Questionnaire (Child Version), and the Self-Efficacy Scale for Children were used.

Table 1
Demographic characteristics of the experimental and control groups.

Variables		Experimental Group		Control Group	
		f	%	f	%
Mother's education level	Literate	0	0	1	1.6
	Primary School	2	3.5	6	9.7
	Middle School	2	3.5	11	17.7
	High School	12	21.1	14	22.6
	University	27	47.4	22	35.5
	Postgraduate	14	24.6	8	12.9
Fatther's education level	Literate	2	3.5	1	1.6
	Primary School	5	8.8	7	11.3
	Middle School	2	3.5	7	11.3
	High School	8	14.0	17	27.4
	University	29	50.9	22	35.5
	Postgraduate	11	19.3	8	12.9

Personal Information Form: The personal information form was created by researchers to collect demographic information about basketball players. These forms include questions about students' gender, age, grade point averages, parents' education levels, family monthly income, total number of siblings, how long they have been involved in basketball, and whether there are any family members who have previously played or are currently playing sports.

The Children's Version of the Perception of Success Questionnaire (POSQ-CH): Roberts et al. (1998) developed and validated this scale. Kazak Çetinkalp (2006, 2009) carried out the Turkish adaptation of the scale. The scale comprises 12 items with two subscales—task-oriented and ego-oriented—rated on a five-point scale. Cronbach's alpha values were found to be .79 for the task-oriented subscale and .77 for the ego-oriented subscale. The test-retest correlation coefficients of the scale were determined to be .88 for ego-oriented and .61 for task-oriented. For this study, the Cronbach's alpha coefficient for the total scale was found to be .84, .94 for the task-oriented subscale, and .89 for the ego-oriented subscale.

Self-Efficacy Scale for Children: The Self-Efficacy Scale for Children was developed by Muris (2001) to assess adolescents' social, academic, and emotional self-efficacy and was adapted into Turkish by Telef and Karaca (2012). The scale consists of 21 items across three subscales (seven items each) and is rated on a five-point Likert scale. Total self-efficacy is calculated by summing the subscale scores, with higher scores indicating higher self-efficacy. Previous research reported Cronbach's alpha coefficients of .82 for social, .84 for academic, .86 for emotional, and .90 for total self-efficacy (Muris, 2002). For this study, the Cronbach's alpha coefficient for the total scale was found to be .85, .75 for social self-efficacy, .76 for academic self-efficacy, and .70 for emotional self-efficacy.

Procedure

The basketball players in the study group did not undergo any additional intervention program beyond their regular basketball training at their respective sports clubs. Pre-test and post-test measurements were used to assess the impact of their ongoing basketball training. The children in the experimental group received 90-minute basketball training sessions three times a week for 12 weeks. The training consisted of 15 minutes of warm-up and stretching, followed by 60 minutes of technical and tactical basketball training, and a final 15 minutes of stretching before cooling down. The study group was defined as having at least three basketball training sessions per week. Young basketball players who maintained consistent training were considered participants in the experimental group, whereas those who missed more than three weeks of training were excluded. The control group consisted of young men aged 11-15 who were not regularly enrolled in any club but had prior experience in sports. The control group was not included in any intervention during the 12-week period.

Data Collection

First, permission was obtained from the Selçuk University Faculty of Sports Sciences Non-Interventional Clinical Research Ethics Committee (no: E-24524194-050.99-1122005/259) for data collection. Participants voluntarily attended the study and gathered

face-to-face in the club's gym after training. An information meeting was held with the basketball players, during which they were informed about the study and measurement process, and their verbal consent was obtained. Following the information meeting, pre-test measurements were administered to the experimental and control groups using a scale package consisting of the measurement scales. Post-test measurements were administered to the experimental and control groups after 12 weeks. It was observed that completing the scale package created for the study took approximately 10 minutes.

Data Analyses

In this study, preliminary analyses (testing assumptions and descriptive statistical analyses) were conducted, and a split-plot ANOVA test was applied to observe the changes in the pre-test and post-test mean scores of both the experimental and control groups within the scope of the research model. This test allows for within-group analyses of variance and determines whether there is a significant difference between groups.

According to Table 2, skewness and kurtosis values for self-efficacy and perceived achievement scores in both groups were within the ±2 range, indicating normal distribution (Tabachnick and Fidell, 2014). Normality was also examined using the Shapiro–Wilk test; although a few variables deviated from normality, the assumption of normality was considered acceptable given the robustness of split-plot ANOVA to minor violations. Homogeneity of variance was subsequently tested using Levene's F test, and the results for pre-test and post-test scores are presented in Table 3.

The homogeneity of variances presented in Table 3 was examined using the Levene's F test. When the values obtained from the measurement instruments used in the experimental and control groups were examined for the pre-test and post-test, it was observed that there was no significant difference between the variances of the groups ($p>.05$), and that the variances were homogeneous across all variables. A dependent-samples t-test was conducted to determine whether the changes in scores within the groups were significant. To examine significant differences in the analysis results, effect size (η^2) was also considered. The statistical significance level was set at .05. The numerical data obtained in this research were analyzed using the IBM SPSS Statistics 22.0 data analysis program.

Results

This section presents the results of the statistical analyses conducted to test the research hypotheses. The analyses related to the research questions are presented under the relevant headings.

The effect of regular training participation on self-efficacy

Analyses were conducted to investigate whether regular training participation affects the self-efficacy scores of male basketball players aged 11-15. The results of the 2x2 split-plot ANOVA analysis performed on the total self-efficacy score are shown in Table 5.

Table 2
Mean, skewness, kurtosis, and Shapiro-Wilk test results for the experimental and control groups.

Variables	Groups	n	Mean	SD	Skewness	Kurtosis	Shapiro-Wilk	p
Self-efficacy pre-test	EG	53	71.67	12.77	.204	-1.082	.952	**.033**
	CG	56	73.43	12.01	-.016	-.228	.985	.687
Self-efficacy post-test	EG	53	83.65	12.53	-.642	-.340	.947	**.020**
	CG	56	72.41	11.78	-.101	-.320	.986	.742
Perceived success pre-test	EG	53	36.21	9.45	-.298	-.775	.968	.169
	CG	56	24.54	8.14	.064	-1.019	.957	**.043**
Perceived success post-test	EG	53	24.64	6.76	.048	-1.055	.964	.107
	CG	56	23.43	6.07	.149	-.457	.982	.554

EG: Experimental Group; CG: Control Group

Table 3
Values regarding the homogeneity of variance of the pre-test and post-test measurements of the groups.

Measurements	n	Sd1	Sd2	F	p
Self-efficacy pre-test	53	1	107	1.762	.187
Self-efficacy post-test	56	1	107	.581	.448
Perceived success pre-test	53	1	107	.854	.357
Perceived success post-test	56	1	107	1.636	.204

Table 4
Results of 2x2 Split-Plot ANOVA for pre-test and post-test self-efficacy score means of experimental and control groups.

Source of Variation	SS	df	MS	F	p	η^2
Inter						
Group (E/C)	612.644	1	612.644	5.217	.024	.046
Error	12565.681	107	117.436			
Within						
Time	1635.092	1	1635.092	24.670	.000	.187
Group*Time	2302.579	1	2302.579	34.741	.000	.245
Error	7091.803	107	66.279			

The analysis revealed a significant difference in the group effect (F(1,107)=5.217, p=.024). This indicates that basketball players who regularly train have significantly higher self-efficacy scores than the control group. In terms of effect size, the group variable has a small effect in explaining the variance (η2= .046). The time variable effect was significant in explaining the difference between the mean scores obtained in pre-test and post-test measurements taken at different times, without group separation [Pillai's Trace=.187, F(1,107) =24.670, p=.000]. In terms of effect size, the time variable had a high effect (η2=.187) (Table 4). In addition, the group × time interaction effect, which examines whether the change between the pre-test and post-test measurements of the experimental and control groups differed, was found to be significant [Pillai's Trace=.245, F(1,107)=34.741, p=.000]. In other words, the pre-test and post-test mean scores of the participants differ in favor of the experimental group, depending on the group they belong to. In terms of effect size, the interaction between group and time appears to have a higher effect (η2=.245). This finding indicates that the effects of regular training participation on psychological variables become more pronounced over time and in favor of the experimental group.

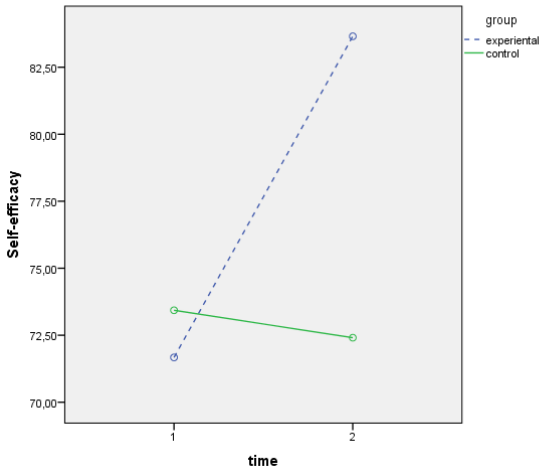

Figure 1. Pre-test and post-test change graph of self-efficacy levels of experimental and control groups.

The graph shows the changes in students' self-efficacy levels between the experimental and control groups from pre-test to post-test (Figure 1). The solid line represents the control group, and the dashed line represents the experimental group.

The effect of regular training participation on the perception of success

To examine whether regular training participation affects perceived success scores, the results of the 2x2 split-plot ANOVA analysis are shown in Table 5.

A significant difference was found for the group effect on perceived success (F(1,107)=25.662, p=.000). This indicates that the success perception scores of basketball players who train regularly are significantly lower compared to the control group. When evaluated in terms of effect size, the group variable was found to have a large effect in explaining the variance (η^2 = .193). The time variable effect was found to be significant in relation to the difference between the mean scores obtained in the pre-test and post-test measurements taken at different times without group separation [Pillai's Trace=.401, F(1,107)=71.634, p=.000]. In addition, group × time interaction effect, which examined whether the change between the pre-test and post-test measurements in terms of perceived success scores of the experimental and control groups differed, was found to be significant [Pillai's Trace=.313, F(1,107)=48.789, p=.000]. In other words, the pre-test and post-test mean scores of the participants differ in favor of the experimental group, depending on the group they are in. When evaluated in terms of effect size, the time variable has a high effect (η2=.401), whereas this effect is slightly reduced with the group variable (η2=.313). The changes in the pre-test and post-test total scores of students' perceived success in the experimental and control groups are presented in the graph (Figure 2). The solid line represents the control group, and the dashed line represents the experimental group.

Table 5

Results of 2x2 Split-Plot ANOVA for pre-test and post-test mean scores of perception of success in Experimental and Control Groups.

Source of Variation	SS	df	MS	F	p	η^2
Inter						
Group (E/C)	1130.136	1	1130.136	25.662	.000	.193
Error	4712.180	107	44.039			
Within						
Time	2186.647	1	2186.647	71.634	.000	.401
Group * Time	1489.289	1	1489.289	48.789	.000	.313
Error	3266.188	107				

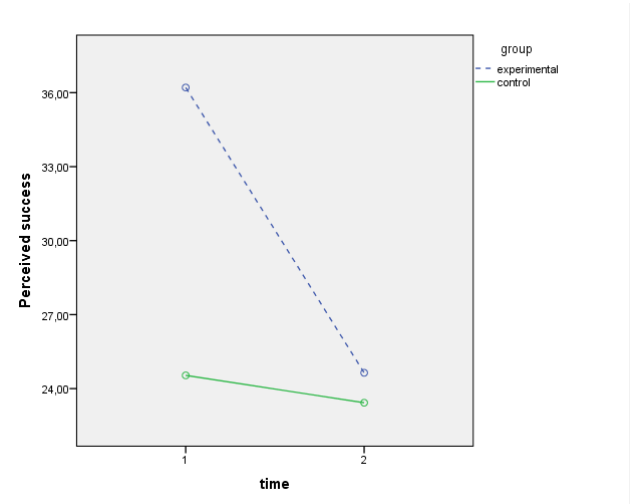

Figure 2. Pre-test and post-test change graph of perceived achievement levels of Experimental and Control Groups.

Overall, the results showed a significant group effect for self-efficacy ($p < .05$), with regularly trained basketball players scoring higher than the control group. Significant time and group–time interaction effects indicated greater increases in self-efficacy in the experimental group. For perceived success, a significant group effect was also observed, with the experimental group showing lower post-test scores than the control group. Significant time and group–time interaction effects further indicated that changes in perceived success differed between groups.

Discussion

This study, conducted to examine the effects of regular basketball training on the perception of success and self-efficacy in 11-15 year old boys, revealed that regular training practices have different time-dependent and group-based effects on self-efficacy and perceptions of success in basketball players. The results revealed an increase in self-efficacy in favor of the experimental group and a decrease in the perception of success, with significant time x group interaction effects pointing to the multidimensional psychological influence of the training process. These results necessitate a discussion of how the effects of regular training on athletes' psychological perceptions can be explained in the light of the literature findings.

The increase in self-efficacy scores observed in 11-15 year old male basketball players in the experimental group is consistent with previous research showing that regular participation in organized sports and structured training programs increases self-efficacy beliefs in children and adolescents (Bandura, 1997; Eime et al., 2013; Lubans et al., 2012). Systematic reviews have shown that physical activity and youth sports interventions, especially in the context of team sports that provide continuous feedback and mastery experiences, positively contribute to adolescents' perceptions of self-efficacy and competence (Allison et al., 1999; Annesi, 2006; Babic et al., 2014; Cataldo et al., 2013; Robbins et al., 2004; Wright et al., 2005). In this context, higher levels of self-efficacy indicate that regular training contributes to the development of athletes' skills and enhances their confidence in performing sport-related tasks. The increase in self-efficacy reflects the contribution of regular training to the development of athletes' skills and their confidence in task performance. The increase in self-efficacy observed in young basketball players can be attributed to the structured nature of regular training sessions; it is thought that training programs likely provide athletes with mastery experiences, clear task expectations, and consistent feedback.

This study found a significant increase in self-efficacy levels and a decrease in perceived success scores among 11-15 years old male athletes participating in regular basketball training. This decrease in perceived success can be considered a significant finding when developmental and contextual factors are taken into account. Perceived success is considered a multidimensional construct in child athletes, shaped

not only by performance outcomes but also by social comparisons, increased training demands, and rising performance standards (Levental et al., 2023; Rottensteiner et al., 2015). The increase in technical awareness among athletes through regular training may have led them to evaluate their performance more critically and perceive success as a more difficult criterion to achieve. The fact that the 11-15 age range is a period when more realistic self-assessments develop cognitively can be considered an important developmental factor explaining this decline in the perception of success (Horn, 2004). Perceived competence and success can fluctuate during adolescence (Weiss & Ferrer-Caja, 2002). As the learning process progresses, the rise in individuals' performance standards can lead to performances previously considered "successful" no longer being seen as sufficient.

It should also be acknowledged that the perceived achievement scores differed between the experimental and control groups at the pre-test stage. Although efforts were made to ensure group equivalence, such baseline differences may occasionally emerge in applied sport settings where participants are drawn from existing training environments rather than strictly controlled laboratory conditions. Therefore, the interpretation of the present findings should not rely solely on baseline comparisons but rather on the pattern of change observed over time. In this study, the significant time × group interaction effect provides a more meaningful indicator of the intervention-related change, suggesting that the differences observed at the post-test stage are better explained by the training process than by the initial group disparity. Accordingly, the findings were interpreted in terms of the longitudinal change pattern rather than the baseline scores, and the group × time interaction was considered the primary indicator of intervention-related change in the present study.

In conclusion, considering the observed increase in self-efficacy and decrease in perceived success together in this study indicates that regular training practices have multidimensional and time-sensitive effects on the psychological structure of athletes, rather than a one-way effect. It can be argued that the training process allows athletes to evaluate their performance more realistically and critically, supporting a motivational orientation focused on learning and development rather than a result-oriented understanding of success. The findings indicate that the decrease in perceived success reflects a restructuring of success criteria rather than a decline in motivation. Indeed, the nature of the sporting environment, offering a context of competence and achievement, makes the decisive role of motivational processes in psychosocial development even more visible. In this respect, sport is considered an important developmental context that supports not only performance outcomes but also the development of fundamental psychosocial skills such as performing under pressure, emotional self-regulation, goal setting, and teamwork (Danish et al., 2002; Gould & Carson, 2008; Smith et al., 2009).

This study has some limitations. First, the perception of success was assessed only with a quantitative measurement tool, and qualitative data on how athletes define success were not collected. It is recommended that future studies use qualitative methods to more deeply examine the cognitive and emotional processes underlying changes in the perception of success. Second, the study sample consisted only of male basketball players; this limitation restricts the generalizability of the findings to different sports or female athletes. Finally, the lack of a direct measurement of training climate (task-oriented or ego-oriented structure) allows for a limited explanation of the contextual aspects of the variation in perceived success.

Conclusion

Taken together, the pre-test–post-test design including a control group strengthens the interpretation that participation in regular basketball training is associated with changes in self-efficacy and perceptions of success during early adolescence. The observed increase in self-efficacy and the restructuring of perceived success suggest that participation in organized sports may not only support the belief in the in competence of young athletes but also contribute to the shaping of more mature and selective performance evaluation criteria. In this context, the change in perceived success can be considered not as a negative training outcome but, rather as a developmental and contextual process related to increased performance awareness and rising training demands in early adolescence.

In this respect, the study provides a theoretical contribution to the literature by offering a multidimensional and time-sensitive framework for the relationship between self-efficacy and perceived achievement, instead of a one-way developmental model. The findings demonstrate that regular training participation strengthens self-efficacy while simultaneously restructuring perceived achievement,

revealing that psychological development in the context of sports is a dynamic, not linear, process. This supports the explanatory power of considering Bandura's Social Cognitive Theory and Nicholls' Achievement Goal Theory together in early adolescence.

From an applied perspective, the results highlight the importance of supporting not only performance outcomes but also task-oriented goals, individual development, and process-based feedback in training environments. Coaches who create a motivational climate that evaluates success through the learning process and individual progress rather than social comparisons or outcome-oriented measures can contribute to sustained increases in self-efficacy along with an adaptive perception of success. Future research is recommended to examine the effects of regular training on perceived success through variables such as perceived training climate, coach behaviors, and social comparison tendencies. Furthermore, longitudinal studies encompassing different sports, female athletes, and age groups will allow for more comprehensive and generalizable conclusions regarding the developmental trajectory of changes in perceived success.

Authors' Contribution

Conceptualization: ÖH, GEH; Data Collection: ÖH; Data curation: GEH; Formal analysis: GEH; Investigation: ÖH, GEH; Writing – original draft: ÖH, GEH; Writing – review & editing: ÖH, GEH; Visualization: GEH; Supervision: ÖH.

Ethical Approval

The study was approved by the Selçuk University of Sport Sciences Faculty Ethical Committee (2025/259) and it was carried out in accordance with the Code of Ethics of the World Medical Association also known as a declaration of Helsinki.

Funding

The authors declare that the study received no funding.

Conflict of Interest

The authors hereby declare that there was no conflict of interest in conducting this research.

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