JSA 13

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Submission date: 18-Dec-2025 10:37AM (UTC+0700)
Submission ID: 2200432542
File name: 13_Desember_2025_JSA_Aminatus_Shaleha_477_490_1.pdf (1.1M)
Word count: 7428
Character count: 45020

Journal Sport Area
http://journal.uir.ac.id/index.php/JSP
Vol. 10. No. 3. December, (2025)

Self-efficacy and self-regulation in football athletes: The moderating role of happiness

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Received 07 October 2025; Accepted 13 December 2025; Published 18 December 2025
Ed 2025; *10*(3): 476-489

ABSTRACT

Background: Self-regulation is a core psychological skill for football athletes because it enables them to maintain attention, manage emotions, and adjust behavior under competitive demands. Although self-efficacy is widely recognized as an important predictor of self-regulation, only a limited number of studies have examined whether positive affect, particularly happiness, moderates this relationship, leaving an empirical gap in understanding how cognitive and emotional resources interact in athlete functioning. **Objective**: This study aimed to investigate the influence of self-efficacy on self-regulation in football athletes and to test whether happiness moderates this association. **Methods**: A quantitative moderated regression design was used with 106 Indonesian male football athletes aged 14 to 22 years who were registered with professional or academy clubs. Data were collected using validated Indonesian versions of the Athlete Self-Efficacy Scale (ASES), the Self-Regulation Questionnaire (SRQ), and the short Oxford Happiness Questionnaire (OHQ). Measurement models demonstrated acceptable reliability and fit, and assumption checks indicated normal residuals, homoscedasticity, and no serious multicollinearity, supporting the use of Moderated Regression Analysis (MRA). **Finding/Results**: The findings showed that both self-efficacy and happiness significantly and positively predicted self-regulation, and happiness significantly moderated (attenuated) the relationship between self-efficacy and self-regulation. The final model explained over half of the variance in self-regulation. **Conclusion**: Although the cross-sectional, self-report, and entirely male sample limits causal interpretation and generalizability, the results highlight the importance of integrating confidence building strategies with happiness enhancing approaches in psychological skills training for football athletes. Future research is encouraged to examine additional moderators using longitudinal or experimental approaches.

Keywords: self-efficacy; self-regulation; happiness; football

https://doi.org/10.25299/sportarea.2025.vol10(3).25125

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How to Cite: Shaleha, S., & Jannah, M. (2025). Self-efficacy and self-regulation in football athletes: The moderating role of happiness. *Journal Sport Area*, *10*(3), 476-489. https://doi.org/10.25299/sportarea.2025.vol10(3).25125

Authors' Contribution: a – Study Design; b – Data Collection; c – Statistical Analysis; d – Manuscript Preparation; e – Funds Collection

INTRODUCTION

Football is widely regarded as one of the most psychologically demanding team sports, requiring athletes to sustain cognitive clarity, emotional stability, and rapid decision-making in contexts characterized by time pressure, spatial uncertainty, and complex tactical structures (Englert & Taylor, 2021; Memmert, 2015). Beyond physical readiness, football performance is shaped by athletes' capacity to regulate their thoughts,

emotions, and behaviors amid fluctuating match demands (Englert, 2016; Bovolon et al., 2024). Recent findings highlight self-regulation as a central determinant of performance consistency, attentional control, motivation maintenance, and adaptive decision-making in high-pressure situations (Ruiz et al., 2020; Scharfen & Memmert, 2019). These demands are magnified by role specific responsibilities: defenders must anticipate threats, midfielders coordinate transitions, and forwards decide under fractions of a second, each requiring substantial regulatory control under dynamic match conditions.

Self-regulation supports athletes in maintaining concentration, managing stressors, adapting to tactical shifts, and recovering from errors during competition (Englert, 2016; Bovolon et al., 2024). Evidence from team sport contexts suggests that athletes with stronger self-regulatory abilities exhibit more stable emotional functioning and more consistent execution of technical tactical tasks (Prasetiyo et al., 2022; Yusuf et al., 2025). This underscores the importance of identifying psychological factors that may contribute to athletes' capacity to self-regulate, particularly in sports such as football where cognitive and emotional demands are exceptionally intense.

One cognitive factor strongly linked to self-regulation is self-efficacy, defined as individuals' belief in their capability to organize and execute actions required to manage situational challenges (Bandura, 1997; Hepler et al., 2021; López-Rodríguez et al., 2025). In sports, higher self-efficacy has been associated with superior coping responses, improved emotional processing, and more effective behavioral regulation during competition (Hepler et al., 2021; López-Rodríguez et al., 2025). Meta-analytic results further indicate that self-efficacy is positively associated with athletic performance and self-regulatory behavior across multiple sport disciplines (Bovolon et al., 2024). However, much of this evidence originates from Western contexts, and research involving football athletes in Southeast Asia, where cultural norms, coaching structures, and competitive environments differ substantially, remains limited (Prasetiyo et al., 2022). This highlights the need for culturally contextualized research on self-efficacy and self-regulation among Indonesian athletes.

Happiness, conceptualized as a positive emotional state encompassing subjective well-being and life satisfaction, has also gained prominence in sport psychology (Diener et al., 2018; Küttel & Larsen, 2020). Within athletic contexts, happiness is increasingly understood not merely as an outcome of performance, but as a psychological resource that supports adaptive functioning, emotional balance, and sustained engagement in training and competition. Empirical studies indicate that athletes experiencing higher levels of happiness tend to demonstrate stronger intrinsic motivation, more frequent use of adaptive self-regulatory strategies, and reduced vulnerability to burnout (Küttel & Larsen., 2020; Pillay et al., 2022). Positive affect has additionally been associated with enhanced attentional flexibility, broader cognitive processing, and improved executive functioning, mechanisms that are theoretically and empirically linked to self-regulation under competitive pressure (Ruiz et al., 2020; Scharfen & Memmert, 2019). Yet, despite these developments, research examining happiness among Indonesian or Southeast Asian football athletes remains sparse (Yusuf et al., 2025), indicating a contextual gap.

Although prior research has independently demonstrated positive relationships between self-efficacy and self-regulation (Bandura, 1997; Bovolon et al., 2024), as well as between happiness and self-regulation (Küttel & Larsen, 2020; Pillay et al., 2022), no empirical studies have examined whether happiness strengthens or weakens the influence of self-efficacy on self-regulation among football athletes. Recent reviews indicate that moderation analyses involving positive affect are rarely conducted in sport psychology and remain largely absent in team sport contexts, including football (López-Rodríguez et al., 2025; Ruiz et al., 2020). Importantly, to date, no published studies have empirically examined this moderating effect within the context of Indonesian football, nor within closely related Southeast Asian contexts such as Malaysia. Although existing research has acknowledged the role of cultural norms, emotional dynamics, and competitive pressures in shaping athletes' psychological functioning in Indonesia and Malaysia, these factors have not yet been integrated into a moderation framework explaining how cognitive and affective variables interact. This empirical gap limits theoretical understanding of the interactive mechanisms through which self-efficacy and affective states jointly influence athletes' self-regulatory functioning (Akbar, Guspa et al., 2025).

These issues may be especially relevant in Indonesian football, where Liga 1 athletes face congested match schedules, high training loads, strong performance expectations from coaches and supporters, and intensive

media attention. Such conditions may intensify emotional strain and challenge athletes' regulatory capacities (Akbar, Syafitri et al., 2025). Analyses of athlete performance trends suggest recurring patterns of emotional fluctuations, decision-making inconsistencies, and stress-related performance declines during dense competition cycles (Yusuf et al., 2025). Under these pressures, self-efficacy alone may not be sufficient to ensure stable self-regulation; happiness may act as a psychological buffer that helps athletes translate confidence into adaptive emotional and behavioral control (Küttel & Larsen, 2020; Pillay et al., 2022). From a theoretical standpoint, the Broaden-and-Build Theory and Social Cognitive Theory together suggest that positive affect may enhance the functional expression of self-efficacy through broadened attentional resources and improved cognitive flexibility (Fredrickson, 2013; Bandura, 1997; Ruiz et al., 2020; Englert & Taylor, 2021).

In light of these considerations, the present study aims to examine the influence of self-efficacy on self-regulation among Indonesian football athletes and to test whether happiness moderates this relationship. By addressing a clear empirical gap, specifically the absence of moderation research in Indonesian and Southeast Asian football, this study contributes to a more nuanced understanding of how cognitive and emotional factors jointly shape athletes' psychological functioning. The findings are expected to inform mental training programs that integrate confidence building and positive affect enhancement to support more consistent self-regulation within the demanding competitive landscape of Indonesian professional football.

METHOD

Type of Research

This study uses a quantitative approach with a moderation regression research design. This design was chosen because it aligns with the research objectives, which are to analyze the effect of self-efficacy on self-regulation with happiness as a moderating variable in football athletes. The regression method allows the researcher to determine the direction, strength, and significance of the relationships between variables, while also testing the role of the moderating variable in strengthening or weakening those relationships (Creswell & Creswell, 2018).

Participant

The participants in this study were football athletes categorized as adolescents based on the developmental classification proposed by Santrock (2019), which defines adolescence as spanning approximately 12 to 22 years of age. The initial target population included football athletes aged 14 to 30 years. However, only athletes aged 14 to 22 years were retained and included as participants in the final analytic sample. This age range represents a transitional developmental period characterized by identity exploration, emotional regulation, and the development of persistence and self-control. These developmental characteristics are closely related to the psychological constructs examined in this study, namely self-efficacy, self-regulation, and happiness.

Athletes aged 23 to 30 years were excluded from the final analysis because individuals in this age range generally demonstrate more established coping strategies, greater emotional stability, and broader competitive experience, which could introduce developmental and career-stage confounds. Restricting the sample to athletes aged 14 to 22 years therefore enhanced sample homogeneity and strengthened the internal validity of the study. All participants were active members of officially registered football clubs in Indonesia and voluntarily agreed to take part in the research.

A purposive sampling technique was employed, whereby participants were intentionally selected based on inclusion criteria aligned with the study objectives. Eligible participants were required to be actively training football athletes, officially registered as members of football clubs in Indonesia, and willing to participate voluntarily in the study. To verify participant eligibility, respondents provided club-related information, including club name, competition level, duration of club membership, training frequency, and competitive experience. Participants represented various officially registered football clubs across different regions of Indonesia, encompassing both academy level and senior level teams.

An a priori power analysis was conducted using G*Power version 3.1 to determine the minimum required sample size. Assuming a significance level of $\alpha = 0.05$, statistical power $(1-\beta) = 0.80$, and a medium effect

size ($f^2 = 0.15$) as recommended by Cohen (1988), the analysis indicated that at least 68 participants were required. A total of 106 athletes met all inclusion criteria and were included in the final sample, exceeding the minimum requirement and thereby enhancing the reliability and statistical power of the study.

Table 1. Demographic Characteristics of Respondents

Category		Frequency	Percent
Ages	14-22	106	100%
Gender	Male	106	100%
Highest Education	Advanced Diploma	1	0.9%
	Bachelor/ Applied Bachelor's Degree	30	28.3%
	Senior High School/ Vocational High School	51	48.1%
	Junior High School	24	22.6%
Length of Membership in the Club	1 - 2 Years	25	23.6%
	6 Months - 1 Years	16	15.1%
	< 6 Months	23	21.7%
	> 2 Years	42	39.6%
Length of Experience as an Athlete	1 - 3 Years	22	20.8%
	4 - 6 Years	34	32.1%
	< 1 Years	16	15.1%
	> 6 Years	34	32.1%
Participation in Competitions	Ever	106	100%
Training Frequency per Week	1 - 2 Times	9	8.5%
	3 - 4 Times	54	50.9%
	5 - 6 Times	36	34.0%
	≥ 7 Times	7	6.6%
Injury History	Ever	79	74.5%
	Never	27	25.5%
After an injury, did you compete again?	Ever	76	71.7%
	Never	30	28.3%

Instrument

In this study, all instruments were developed and evaluated through Confirmatory Factor Analysis (CFA) to ensure construct validity before being used on a sample of football athletes. CFA is a theory-driven approach used to assess the extent to which observed variables represent underlying latent constructs. According to methodological guidelines (Hair et al., 2019; Kline, 2023), factor loading values indicate the strength of the relationship between each item and its latent factor. Loadings of 0.40 or higher are generally recommended as acceptable for psychological measurement, 0.50 or higher are considered practically significant, and values above 0.70 indicate strong item construct relationships. Items with loadings below 0.40 are typically recommended for removal because they do not adequately measure the intended construct.

The self-efficacy instrument used the Athlete Self-Efficacy Scale (ASES) developed by Koçak (2020) and validated in the Indonesian context (Mubarak et al., 2025). This instrument consists of 16 items representing four dimensions: sport discipline efficacy, psychological efficacy, professional thought efficacy, and personality efficacy. CFA results showed that all items met construct validity, with factor loading values ranging from 0.569 to 0.887, which exceed the recommended minimum threshold of 0.40. These results indicate that all items adequately represented the self-efficacy construct; therefore, all items were retained for further analysis.

The self-regulation instrument used the Self-Regulation Questionnaire (SRQ) adapted from Brown et al. (1999) and further developed into an Indonesian version by Yuzarion et al. (2020), which measures metacognitive, motivational, and behavioral aspects. The initial instrument contained 19 items; however, CFA results indicated that only 11 items were valid, with factor loadings ranging from 0.482 to 0.861. Following recommended CFA criteria, items with inadequate loadings (below 0.40) were removed, and only the 11 valid items were used in this study.

The happiness instrument used the short version of the Oxford Happiness Questionnaire developed by Barattucci et al. (2024) Unlike the long version of the OHQ by Hills and Argyle (2002), this short form was designed as a unidimensional instrument, meaning all items represent a single overall happiness factor. The initial instrument consisted of 8 items, but CFA results indicated that only 5 items met construct validity, with factor loadings ranging from 0.522 to 0.893. Each retained item demonstrated acceptable to strong loading values, while three items were eliminated for not meeting the recommended minimum factor loading threshold of 0.40.

Theoretically, all these instruments have demonstrated reliability in previous studies (Koçak, 2020; Yuzarion et al., 2020; Barattucci et al., 2024). However, reliability testing was repeated using this study sample to ensure internal consistency within the specific context of football athletes. The results showed that the Athlete Self-Efficacy Scale had a Cronbach's alpha value of 0.928, the Self-Regulation Questionnaire a value of 0.783, and the Oxford Happiness Questionnaire a value of 0.807. These values indicate that all instruments possess good reliability and are appropriate for use in this research.

Table 2. Fit Indices

	CFI	TLI	RMSEA
Self-Efficacy	0.911	0.891	0.090
Self-Regulation	0.962	0.948	0.063
Happiness	0.941	0.882	0.147

The fit index analysis indicated that the CFA models for each instrument demonstrated varying levels of model adequacy. The self-efficacy instrument showed acceptable model fit, with a CFI of 0.911 and a TLI of 0.891, as well as an RMSEA value of 0.090, which remains within the tolerable range for multidimensional models. The self-regulation instrument demonstrated excellent model fit, as reflected in its CFI of 0.962, TLI of 0.948, and RMSEA value of 0.063, all of which fall within the good fit criteria. In contrast, the happiness instrument exhibited less optimal fit, with a CFI of 0.941 indicating good fit, but a TLI of 0.882 and an RMSEA value of 0.147 indicating poor fit. Nevertheless, elevated RMSEA values are commonly observed in unidimensional models with a small number of items, suggesting that the model may still be cautiously accepted when considered alongside other fit indices and theoretical support (Hu & Bentler, 1999; Kline, 2023; Hair et al., 2019; Kenny et al., 2015).

Procedures

The research procedures consisted of several sequential stages, including survey administration, participant verification, informed consent, and data screening. The study employed an online survey design, with data collected via Google Forms containing standardized psychological questionnaires. The survey link was distributed through verified football networks, including club administrators, coaches, and athlete community channels known to the researchers, to ensure appropriate access to the target population.

At the initial stage, respondents were required to provide club-related information, such as club name, competition level, duration of membership, training frequency, and competitive experience. This information was used to verify participants' status as active football athletes and to ensure compliance with the inclusion criteria. Responses that could not be validated or did not meet the criteria were excluded prior to analysis.

Before completing the questionnaires, participants were informed about the study objectives, procedures, and their rights as participants, and electronic informed consent was obtained. Participation was voluntary, and anonymity and confidentiality were assured. After data collection, the dataset was screened for incomplete or inconsistent responses, and only eligible and verifiable data were retained for subsequent data analysis. Although self-report measures may be subject to response bias, data authenticity was supported through anonymous participation, eligibility verification, and distribution via trusted football organizations; however, self-report bias cannot be entirely eliminated. To enhance clarity and avoid redundancy, the main stages of the research procedure are summarized in **Table 3**.

Table 3. Research Procedures

Stage	Research Activity	Description
1	Survey Administration	Online data collection was conducted using Google Forms containing standardized psychological questionnaires. The survey link was distributed through verified football networks, including club administrators, coaches, and athlete community channels.
2	Participant Verification	Club-related information (club name, competition level, length of membership, training frequency, and competitive experience) was collected to verify participants' eligibility as active football athletes. Ineligible responses were excluded.
3	Informed Consent	Participants received information regarding the study objectives, procedures, and their rights. Electronic informed consent was obtained prior to participation.
4	Data Screening	The dataset was screened for incomplete or inconsistent responses, and only eligible and verifiable data were retained for statistical analysis.

Data Analysis

Data were analyzed using JASP version 0.95.4. Initial analyses included descriptive statistics to summarize the distribution of each study variable. Assumption testing was conducted prior to hypothesis testing. Data normality was assessed using the Kolmogorov–Smirnov test. In addition, regression assumptions were evaluated through visual inspection of standardized residuals using a histogram of residuals and a normal Q-Q plot to assess residual normality, as well as a scatterplot of residuals versus predicted values to examine homoscedasticity. Multicollinearity among predictors was assessed using multicollinearity diagnostics.

Because two variables did not meet the normality assumption, non-parametric correlation analysis using Spearman's rho was employed to examine bivariate associations among self-efficacy, self-regulation, and happiness. Despite the non-normal distribution of self-efficacy, multiple linear regression analysis was retained because the residuals satisfied the assumption of normality. Regression models are considered robust to violations of predictor normality when residuals are normally distributed (Lumley et al., 2002; Schmidt & Finan, 2018). Potential external factors such as training frequency and competition level were not included as covariates, as the theoretical model and study objectives focused exclusively on the psychological mechanisms linking self-efficacy, happiness, and self-regulation.

Subsequently, multiple regression analysis was conducted to examine the predictive roles of self-efficacy and happiness on self-regulation. The moderating effect of happiness was tested using Moderated Regression Analysis (MRA), which was implemented in a hierarchical manner. Model 1 tested the main effect of self-efficacy on self-regulation, Model 2 added happiness as a predictor, and Model 3 introduced the interaction term (self-efficacy × happiness). Prior to these analyses, both predictor variables were mean-centered, and the centered variables (SE_c and H_c) were consistently used across all three models to maintain comparability and reduce potential multicollinearity in the interaction model.

Model evaluation was based on model summary indices, including R, R^2, Adjusted R^2, and RMSE. Regression coefficients were evaluated using standardized coefficients (β), t-values, and p-values, with a significance level set at $\alpha = 0.05$. To further examine the nature of the interaction effect, simple slope analysis was conducted. The interaction was interpreted using both a simple slope table and a simple slope plot, illustrating the relationship between self-efficacy and self-regulation at different levels of happiness.

RESULTS AND DISCUSSION

To provide an overview of the study variables, descriptive statistics were calculated for self-efficacy, self-regulation, and happiness, including the range, minimum, maximum, mean, and standard deviation. The results are presented in **Table 4**.

Table 4. Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Self-Efficacy	106	40.00	40.00	80.00	72.11	8.274
Self-Regulation	106	30.00	20.00	50.00	43.89	6.043
Happiness	106	15.00	10.00	25.00	20.47	3.533

Descriptive analyses indicated that all variables were assessed among 106 respondents. Self-efficacy scores ranged from 40 to 80 (M = 72.11, SD = 8.27), reflecting generally high and moderately varied levels of athletes' confidence. Self-regulation scores ranged from 20 to 50 (M = 43.89, SD = 6.04), suggesting relatively high self-regulatory abilities with moderate variability. Happiness scores ranged from 10 to 25 (M = 20.47, SD = 3.53), indicating moderate to high levels of happiness with lower variability compared to the other variables.

Table 5. Normality Test

	Kolmogorov-Smirnov		
Variable	**N**	**Statistic**	**p-value**
Self-Efficacy	106	0.169	.005
Self-Regulation	106	0.150	.017
Happiness	106	0.122	.083

The results of the Kolmogorov–Smirnov normality test for the three variables are presented in **Table 5**. The analysis shows that the p-value for self-efficacy is .005, which is below the .05 threshold, indicating that the self-efficacy data deviate significantly from the assumption of normality. Similarly, the p-value for self-regulation is .017, also below .05, suggesting that this variable does not meet the normality assumption. In contrast, the happiness variable has a p-value of .083, which exceeds the .05 criterion, indicating that the data for happiness are normally distributed. Thus, only the happiness variable satisfies the normality assumption, whereas self-efficacy and self-regulation do not.

Table 6. Non-Parametric Test

Variable		**Self-Efficacy**	**Self-Regulation**
Self-Efficacy	Spearman's rho	-	
	p-value	-	
Self-Regulation	Spearman's rho	0.711***	-
	p-value	<.001	-
Happiness	Spearman's rho	0.527***	0.559***
	p-value	<.001	<.001

Table 6 presents the results of the non-parametric Spearman's rho test conducted for the three variables (self-efficacy, self-regulation, and happiness). This non-parametric approach was used because two variables did not meet the assumption of normality, as shown in **Table 5**. The results indicate that all variables are significantly and positively correlated. Self-efficacy shows a strong positive correlation with self-regulation ($\rho = 0.711$, $p < .001$), suggesting that athletes with higher self-efficacy tend to demonstrate better self-regulation. Additionally, self-efficacy is moderately correlated with happiness ($\rho = 0.527$, $p < .001$), indicating that greater confidence is associated with higher levels of happiness. Furthermore, self-regulation and happiness also exhibit a strong positive correlation ($\rho = 0.559$, $p < .001$), meaning that athletes with better self-regulation are more likely to experience higher happiness. Overall, these findings demonstrate significant and positive associations among self-efficacy, self-regulation, and happiness.

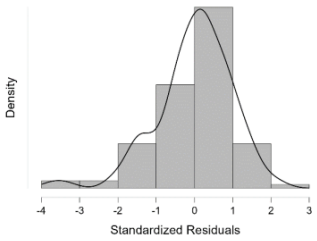

Figure 1. Histogram Residuals

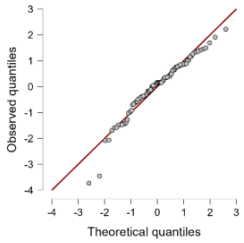

Figure 2. Q-Q Plot Residuals

Figure 1 and **Figure 2** present the results of the residual normality assessment for the regression model. The histogram in **Figure 1** shows a distribution that closely approximates a normal curve, with most residual values concentrated around zero and displaying relatively symmetric dispersion. This indicates that the residuals do not deviate substantially from normality. This observation is further supported by the Q-Q plot in **Figure 2**, where the data points align closely with the diagonal reference line, with only minor deviations at the tails. Overall, these visualizations confirm that the assumption of residual normality is satisfied, allowing the regression analysis to proceed appropriately, as recommended in regression diagnostics guidelines (Love et al., 2019).

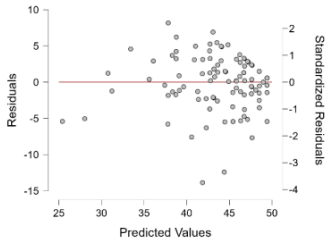

Figure 3. Scatterplot of Residuals vs. Predicted Values

Figure 3 presents the scatterplot of residuals against predicted values, illustrating the assessment of homoscedasticity in the regression model. The residuals appear randomly dispersed around the horizontal zero line, with no observable funnel shape or systematic pattern across the predicted values. This random distribution indicates that the variance of the residuals remains relatively constant, suggesting that the assumption of homoscedasticity is met. Additionally, the absence of clustering or curved patterns supports the linearity assumption of the model. Overall, the scatterplot confirms that the regression model does not exhibit heteroscedasticity and that the residuals behave appropriately for a well-fitting linear model.

Table 7. Multicollinearity

Model	Dimension	Eigenvalue	Condition Index	(Intercept)	Self-Efficacy	Happiness
M1	1	2.980	1.000	0.001	0.001	0.002
	2	0.015	14.205	0.328	0.014	0.755
	3	0.005	23.342	0.671	0.985	0.243

Table 7 presents the multicollinearity diagnostics based on eigenvalues and condition indices. The highest condition index is 23.342, which remains below the critical threshold of 30, indicating that no serious multicollinearity is present in the model. The variance proportions across predictors (self-efficacy and happiness) are not simultaneously inflated in the same dimension, further confirming the absence of collinearity problems. Overall, the results demonstrate that the regression model meets the assumption of multicollinearity and is suitable for further analysis.

Table 8. Model Summary MRA (Model 1-3)

	R	R^2	Adjusted R^2	RMSE
Model 1 (SE_c → SR)	0.760	0.578	0.574	3.945
Model 2 (SE_c + H_c → SR)	0.790	0.625	0.618	3.737
Model 3 (SE_c + H_c + SE_c×H_c → SR)	0.800	0.639	0.629	3.683

Note. SE_c = mean-centered self-efficacy; H_c = mean-centered happiness; SR = self-regulation. Model 3 includes the interaction term (SE_c × H_c)

As shown in **Table 8**, the R^2 values increased from 0.578 in Model 1 (self-efficacy) to 0.625 in Model 2 (addition of happiness), and further to 0.639 in Model 3 with the inclusion of the self-efficacy × happiness interaction, indicating improved predictive capacity across models. The calculation of Cohen's effect size, computed using the formula $f^2 = \frac{R^2}{1-R^2}$, also showed very strong contributions across all models, with f^2 = 1.37 for Model 1, f^2 = 1.67 for Model 2, and f^2 = 1.77 for Model 3. These findings confirm that self-efficacy, happiness, and their interaction exert a substantial influence in explaining the variance in self-regulation (Cohen, 1988).

Table 9. Regression Coefficients of Moderated Regression Analysis

	Predictor	B	Standard Error	β	t	p-value	Collinearity Statistics	
							Tolerance	VIF
Model 1	Intercept	43.885	0.383		114.53	< .001		
	SE_c	0.555	0.047	0.760	11.93	< .001		
Model 2	Intercept	43.885	0.363		120.891	< .001		
	SE_c	0.440	0.055	0.602	8.059	< .001		
	H_c	0.459	0.128	0.268	3.587	< .001		
Model 3	Intercept	44.232	0.397		111.443	< .001		
	SE_c	0.370	0.064	0.506	5.784	< .001	0.461	2.168
	H_c	0.470	0.126	0.275	3.728	< .001	0.651	1.536
	SE_c × H_c	-0.020	0.010	-0.151	-2.020	.046	0.631	1.586

Note. SE_c = mean-centered self-efficacy; H_c = mean-centered happiness; SE_c × H_c = interaction term between self-efficacy and happiness. Tolerance and VIF are reported for the final model only, as collinearity diagnostics are most relevant when testing the interaction term.

As shown in **Table 9**, self-efficacy consistently demonstrated a significant positive effect on self-regulation across all models. In Model 1, self-efficacy strongly predicted self-regulation (β = 0.760, t = 11.93, p < .001). After adding happiness in Model 2, both self-efficacy (β = 0.602, t = 8.059, p < .001) and happiness (β = 0.268, t = 3.587, p < .001) remained significant predictors. In Model 3, the interaction term between self-efficacy and happiness showed a significant negative effect (β = -.151, t = –2.020, p = .046), indicating a moderating effect in which higher happiness weakens the positive relationship between self-efficacy and self-regulation. The collinearity statistics (VIF 1.536-2.168) remained within acceptable limits, confirming that multicollinearity was not a concern in the moderated regression model.

Table 10. Tabel Simple Slope Estimates

			H_c	Label	Estimate	Std. Error	z-value	p-value	95% Confidence Interval		Std. Estimate
									Lower	Upper	
SE_c	→	SR	16	(c1 + c3 * -4.472)	0.176	0.097	1.817	.069	-0.014	0.365	0.207
SE_c	→	SR	50	(c1 + c3 * 0.528)	0.132	0.118	1.118	.264	-0.100	0.364	0.156
SE_c	→	SR	84	(c1 + c3 * 4.528)	0.097	0.170	0.571	.568	-0.237	0.432	0.115

Note. SE_c = mean-centered self-efficacy; H_c = mean-centered happiness; SR = self-regulation. Simple slopes represent the conditional effects of self-efficacy on self-regulation at low (H_c = 16), moderate (H_c = 50), and high (H_c = 84) levels of happiness.

As shown in **Table 10**, the simple slope estimates further clarify the moderating effect identified in **Table 9**. At low levels of happiness (H_c = 16), the effect of self-efficacy on self-regulation was positive but only marginally significant (Estimate = 0.176, p = .069). At moderate levels of happiness (H_c = 50), the slope weakened and became nonsignificant (Estimate = 0.132, p = .264). At high levels of happiness (H_c = 84), the slope further diminished (Estimate = 0.097, p = .568). These patterns indicate that as happiness increases, the strength of the relationship between self-efficacy and self-regulation becomes weaker, consistent with the negative interaction effect reported in **Table 9**. This demonstrates that happiness attenuates the positive effect of self-efficacy on athletes' self-regulation.

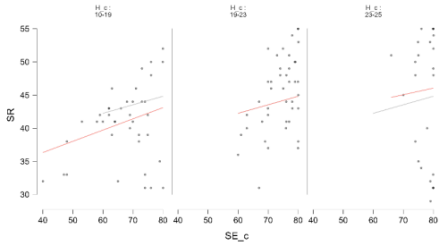

Figure 4. Simple Slope Graph (Interaction Plot)

Figure 4 visually supports the statistical results in **Table 10**. The slope is steepest at low levels of happiness, indicating that the positive association between self-efficacy and self-regulation is strongest when athletes feel less happy. At moderate levels of happiness, the slope becomes noticeably flatter, reflecting a weakened influence of self-efficacy as happiness increases to a mid-range level. At high levels of happiness, the slope becomes even more shallow, showing the weakest association among the three conditions. This progressive flattening of the slope across low, moderate, and high happiness levels aligns with the negative interaction coefficient in **Table 9** and confirms that happiness attenuates, rather than strengthens, the effect of self-efficacy on self-regulation.

The present study examined the influence of self-efficacy on self-regulation among Indonesian football athletes and tested happiness as a moderating variable. The findings indicate that both self-efficacy and happiness significantly predict self-regulation, with happiness demonstrating a salient role in the final model as both a direct predictor and a moderator. In addition, happiness moderates the relationship between self-efficacy and self-regulation, indicating that athletes' cognitive confidence operates within, and is shaped by, their affective states.

The positive effect of self-efficacy on self-regulation supports Social Cognitive Theory, which emphasizes that beliefs about personal capability guide effort allocation, persistence, and the application of self-regulatory strategies under pressure (Bandura, 1997; Hepler et al., 2021; Bovolon et al., 2024). Football athletes with higher self-efficacy are more likely to maintain attentional focus, regulate emotions, and persist in goal-directed behavior during training and competition. This finding is consistent with previous sport psychology

research showing that self-efficacy facilitates emotional control, adaptive coping, and decision-making in high-demand sport environments (Hepler et al., 2021; Bovolon et al., 2024).

Happiness also emerged as a significant direct predictor of self-regulation, highlighting the importance of affective resources alongside cognitive beliefs in supporting athletes' regulatory processes. From the perspective of the Broaden-and-Build Theory, positive emotions broaden attentional scope, enhance cognitive flexibility, and support executive functioning, all of which are central mechanisms underlying self-regulation (Fredrickson, 2013; Ruiz et al., 2020; Englert & Taylor, 2021). In emotionally demanding football contexts, athletes who experience higher happiness may enter a more optimal psychological state that stabilizes motivation, reduces emotional volatility, and facilitates adaptive behavioral control. As a result, happiness may directly strengthen self-regulation by creating favorable emotional conditions in which regulatory strategies can function effectively (Küttel & Larsen, 2020; Pillay et al., 2022).

The prominent role of happiness may also be explained by the developmental characteristics of the sample. The participants were adolescents and emerging adults aged 14-22 years, a developmental period in which emotional regulation and executive control systems are still maturing (Santrock, 2019). During this stage, affective experiences tend to exert a strong influence on behavior, often outweighing purely cognitive evaluations. Younger athletes may therefore rely more heavily on emotional stability to manage pressure, recover from errors, and sustain motivation. This developmental sensitivity to affect helps explain why happiness plays a particularly important role in supporting self-regulation in this study population.

The moderation analysis provides further insight into the interaction between cognitive and affective factors. The simple slope analysis and interaction plot show that the association between self-efficacy and self-regulation is strongest when happiness is low and progressively weakens at moderate and high levels of happiness. This pattern indicates that when athletes experience lower happiness, self-efficacy becomes a critical psychological resource for maintaining self-regulation. In contrast, when happiness is high, athletes appear capable of regulating their behavior effectively regardless of variations in confidence. In this condition, positive affect seems to compensate for lower levels of self-efficacy, thereby reducing its marginal contribution to self-regulation.

Mechanistically, these findings reflect an affective–cognitive compensation process. Positive emotional states enhance baseline regulatory capacity by stabilizing attention, broadening cognitive resources, and reducing emotional reactivity. Consequently, the additional benefit of self-efficacy becomes less pronounced when happiness is high. Conversely, under low happiness conditions, limited affective resources increase athletes' reliance on cognitive beliefs about their competence to sustain regulatory behavior. This interpretation aligns with integrative models of self-regulation that emphasize the dynamic interplay between emotional and cognitive systems in guiding behavior under pressure (Englert & Taylor, 2021).

Taken together, the findings indicate that self-regulation in football athletes is not driven by confidence alone but emerges from the interaction between cognitive beliefs and emotional states. From a practical perspective, psychological interventions should move beyond a sole focus on confidence building strategies. Coaches and sport psychologists may benefit from integrating approaches that enhance positive affect, such as supportive coaching climates, emotional recovery routines, and mindfulness based practices, particularly for adolescent and academy level athletes whose self-regulatory capacities are still developing. Such integrated programs may help athletes maintain more stable self-regulation and adaptive performance under competitive pressure.

Several limitations should be acknowledged. The cross-sectional design limits causal inference, and reliance on self-report measures may introduce response bias. In addition, the exclusively male sample within a restricted age range limits generalizability. Future research is encouraged to employ longitudinal or experimental designs, incorporate behavioral or physiological indicators of self-regulation, and examine whether the moderating role of happiness differs across developmental stages, competitive levels, or cultural contexts.

CONCLUSION

The findings of this study demonstrate that self-efficacy and happiness are significant predictors of self-regulation among football athletes. Self-efficacy contributes to athletes' confidence, persistence, and task engagement, while happiness shapes the functional expression of self-efficacy by supporting emotional stability, cognitive flexibility, and adaptive appraisal of competitive demands. The moderating role of happiness indicates that positive emotional states constitute an important condition under which athletes' confidence can be translated into effective self-regulatory behavior, particularly in high-pressure match environments. These findings extend Social Cognitive Theory and the Broaden-and-Build Theory by illustrating how cognitive beliefs and positive emotions interact to influence self-regulation in real competitive contexts. Self-efficacy provides the belief that goals can be achieved, whereas happiness broadens attentional focus and behavioral options, allowing athletes to apply self-regulatory strategies more flexibly and consistently. This integrated perspective highlights the importance of considering cognitive and affective resources jointly when explaining psychological functioning in football.

Several methodological limitations should be acknowledged. The use of self-report questionnaires and a cross-sectional design limits causal inference and may introduce response biases, including social desirability and common method variance. Furthermore, the sample was restricted to Indonesian football athletes within a specific age range and competitive level, limiting the generalizability of the findings to other populations and sport contexts, while contextual factors such as coaching style, team culture, and recent performance history were not directly examined. Despite these limitations, the findings have practical implications for Indonesian football across academy, elite, and grassroots levels. Coaches and sport psychologists are encouraged to implement integrated psychological interventions that combine self-efficacy–building strategies with structured positive emotion practices to enhance athletes' mental readiness. Future research should employ longitudinal or experimental designs and examine additional moderating variables, such as perceived stress, team cohesion, and coach athlete relationship quality, to clarify causal mechanisms and strengthen the evidence base for context-sensitive psychological interventions in football.

ACKNOWLEDGEMENTS

The author sincerely acknowledges all respondents for their generous contribution of time and effort to this study. Deep gratitude is also extended to the principal academic advisor for their invaluable guidance, constructive feedback, and continuous support throughout the research process. The encouragement and motivation from family and colleagues have also been important factors in helping the researcher complete this study successfully. In addition, the researcher conveys heartfelt gratitude to Allah, the Almighty God, for the ease and smoothness granted throughout the implementation of this research.

CONFLICT OF INTEREST

The author affirms the absence of any conflicts of interest in relation to this study. All procedures involved in conducting the research and preparing the manuscript were performed independently, without any external influence that could compromise the objectivity of the findings or their interpretation.

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