



# The role of implicit beliefs about emotions and emotion regulation on psychological adjustment: a study among youth athletes

original paper

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MIGUEL CUNHA<sup>1</sup> , RUI SOFIA<sup>1,2</sup> , CLÁUDIA DIAS<sup>1</sup> 

<sup>1</sup> Faculty of Sport, Centre of Research, Education, Innovation and Intervention in Sport (CIFI2D), Porto, Portugal

<sup>2</sup> Research Center in Sports Performance, Recreation, Innovation and Technology (SPRINT), School of Sport and Leisure, Polytechnic Institute of Viana do Castelo, Melgaço, Portugal

## ABSTRACT

**Purpose.** Youth psychological health and well-being are currently alarming. Young athletes face the same stressors as their non-athletic peers, in addition to unique challenges related to sports. This study aimed to understand the role of self-control and emotion regulation on the young athlete's psychological well-being, while also considering the influence of implicit beliefs about emotions.

**Methods.** One-hundred and forty-five athletes ranging from 15 to 21 ( $16.21 \pm 1.44$ ) completed an online survey with self-report measures of trait anxiety, perceived stress, positive and negative affect, subjective happiness, life satisfaction, implicit beliefs about emotions, self-control, and emotion regulation.

**Results.** Findings suggested that implicit beliefs about emotions and self-control predicted better psychological adjustment, whereas expressive suppression was associated with poorer outcomes. However, self-control and emotional regulation were mediators of the relationship between implicit beliefs and psychological adjustment.

**Conclusions.** Incremental beliefs about emotions are central to promoting the young athlete's psychological adjustment and well-being.

**Key words:** self-control, young athletes, emotion regulation, psychological adjustment, implicit beliefs

## Introduction

Although youth sports participation is often associated with improved well-being and mental health, competition often presents a new set of circumstances [1]. Youth athletes are subjected to the same stressors as their non-athletic peers [2] but are also faced with several unique stressors due to competition. Additionally, their overwhelming schedule leaves little leisure time for social activities, hobbies and, most importantly, rest, negatively impacting their mental health and well-being [3]. Moreover, competition is highly stressful, involving rivalry, meeting expectations, dealing with spectators, and possibly coping with aggressive behaviours from coaches [4]. Due to these unique stressors, exploring youth athletes' psychological health and well-being is urgent to develop tools for navigating this stressful environment and alleviating the potential future consequences.

Implicit beliefs about emotions, emotion regulation, and youth mental health and well-being

Individuals can hold implicit beliefs about the fixed or malleable/incremental nature of several traits/attributes, including emotions [5]. Generally, incremental or malleable beliefs about emotions refer to one's belief that emotions are controllable, as opposed to fixed or entity beliefs about emotions, which reflect believing that emotions are fixed and cannot be changed [5]. As stated previously, adolescence is a transitional period with its unique stressors and challenges. A fixed mindset is associated with diminished well-being and psychological disorders, such as anxiety and depression. Studies have confirmed these associations in adolescents and young adults [6, 7].

Moreover, implicit beliefs about emotions are closely associated with emotional regulation [e.g. 6]. Many emotional regulation strategies can be identified, although

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*Correspondence address:* Rui Sofia, Centre of Research, Education, Innovation and Intervention in Sport (CIFI2D), Faculty of Sport, Rua Dr. Plácido da Costa, n. 91, 4200-450 Porto, Portugal, e-mail: [ruisofia@fade.up.pt](mailto:ruisofia@fade.up.pt); <https://orcid.org/0000-0002-1497-6915>

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the two most researched are cognitive reappraisal (CR, changing perception towards a particular event) and expressive suppression (ES, attempting to hide any outward emotional expression) [8].

CR is commonly associated with improved well-being and psychological health, while the regular use of ES has been shown to lead to increased levels of psychological distress and, consequently, lower overall well-being [8, 9]. Nonetheless, individuals with an incremental mindset may be more prone to use reappraisal instead of suppression [6]. Regarding ES, it could be hypothesized that a more entity mindset would increase the frequency of the use of ES. However, studies identified that suppression use is independent of one's beliefs about emotions [5].

### Self-control and youth mental health and well-being

Besides being at a stage of life with new and enhanced demands on self-regulation, youth athletes also face the additional pressures of sports participation [1]. Self-control is the ability to suppress unwanted emotions, desires, and actions in favour of more appropriate alternatives. It is often associated with postponed gratification and the ability to prioritise long-term goals in place of short-term satisfaction and/or distractions [10]. Individuals with high self-control are more accomplished academically and financially, more friendly and trustworthy, healthier psychologically and physically, and more capable of adapting to different environments [11]. Even though it is possible to change, for most people, self-control remains stable since it developed during youth [11]. High levels of self-control during adolescence may be beneficial for academic success, building positive relationships and related skills and making life choices that promote overall well-being [12].

### The current study

After addressing the importance of this developmental stage to several adulthood outcomes, the main goal of the present study was to explore how youth athletes' implicit beliefs about emotions, emotional regulation, and self-control predict psychological health, emotional affect, and subjective well-being.

Additionally, De Castella et al. [6] suggested that implicit beliefs are associated with well-being/distress through CR. In their turn, both self-control [12] and CR [9] are associated with positive subjective well-being outcomes. Therefore, the mediating role of emotional regulation strategies and self-control in the relation-

ship between beliefs about emotions with trait anxiety, perceived stress, life satisfaction and subjective happiness was also explored.

## Material and methods

### Participants

A priori power analysis using G\*Power (v. 3.1) was performed to calculate the minimum sample size recommended for detecting a significant effect in hierarchical multiple regression. Thus, six predictors were considered for a medium effect size of 0.15 (Cohen's  $f^2$ ), a power of 0.95 and an alpha level of 0.05. For this study, 119 would be the minimum number of participants to allow the detection of significant effects. The final sample size was 145 athletes ( $n = 86$ , 59.3% females) ranging from the ages of 15 and 21 ( $M = 16.21$ ,  $SD = 1.44$ ). Participants were from different sports ( $n = 109$ , 75.2%, volleyball;  $n = 16$ , 11.0%, basketball;  $n = 16$ , 11.0%, football; and  $n = 4$ , 2.8% others) and age categories namely sub-16 ( $n = 48$ , 33.3%), under-17 ( $n = 50$ , 34.7%), under-19 ( $n = 19$ , 13.2%), under-21 ( $n = 19$ , 13.2%) and senior ( $n = 8$ , 5.6%). The sample's average weekly hours of training in the current year was 7.31 ( $SD = 2.70$ ), having been practising their sport for an average of 5.61 years ( $SD = 3.43$ ).

### Measures

#### *State-trait anxiety inventory*

Trait anxiety was measured with the state-trait anxiety inventory for adults (STAI Form Y-2) developed by Spielberger et al. [13] and subsequently tested and translated to Portuguese by Silva and Campos [14]. It consists of 20 items answered on a 4-point Likert scale ranging from 1 (almost never) to 4 (almost always). The total score is the sum of its items ranging from 20 to 80, with higher scores reflecting greater anxiety. Reliability analysis in the present sample revealed a Cronbach's alpha of 0.94.

#### *Perceived stress scale*

Perceived stress was measured with the perceived stress scale (PSS-10) developed by Cohen et al. [15] and subsequently tested and translated to Portuguese by Trigo et al. [16]. It consists of 10 items answered on a 5-point Likert scale ranging from 1 (never) to 5 (very frequently). The total score is the sum of its items ranging from 10 to 50, with higher scores correlating with

greater perceived stress. Reliability analysis in the present sample revealed a Cronbach's alpha of 0.88.

#### *Positive affect and negative affect scale*

The overall mood and emotions one is experiencing throughout the day were measured with the positive affect and negative affect scale (PANAS) developed by Watson et al. [17] and subsequently tested and translated into Portuguese [18]. It consists of 20 items answered on a 5-point Likert scale ranging from 1 ("I'm nothing like that") to 5 ("I'm always like that"). Of those items, ten measure positive affect (e.g., proud, inspired) and ten measure negative affect (e.g., guilty, nervous). Reliability analysis in the present sample revealed a Cronbach's alpha of 0.78 for positive affect and 0.83 for negative affect.

#### *Satisfaction with life scale*

Global life satisfaction was measured with the satisfaction with life scale (SWLS) developed by Diener et al. [19] and subsequently tested and translated into Portuguese [18]. It consists of 5 items answered on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Scores range from 5 to 35, with higher scores meaning greater life satisfaction. Reliability analysis in the present sample revealed a Cronbach's alpha of 0.87.

#### *Subjective happiness scale*

A broader aspect of one's well-being is one's overall subjective happiness, which was measured with the subjective happiness scale (SHS) developed by Lyubomirsky and Lepper [20] and subsequently tested and translated to Portuguese [21]. Four items are answered on a 7-point Likert scale ranging from 1 (totally disagree) to 7 (totally agree). The total score is the average of the four items, ranging from 1 to 7, with the higher scores reflecting greater subjective happiness. In the current sample, a reliability analysis revealed a Cronbach's alpha of 0.77.

#### *Implicit beliefs about emotions scale*

Personal beliefs about the malleability of emotions were measured with the implicit beliefs about emotions scale (IBES) developed by Tamir et al. [5] and subsequently adapted to a first-person perspective [6] and tested and translated into Portuguese [22]. The questionnaire consists of four items answered on a 5-point

Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total score was calculated by averaging all the items, with higher scores reflecting a greater propensity to hold incremental beliefs. Reliability analysis in the present sample revealed a Cronbach's alpha of 0.76.

#### *Emotional regulation questionnaire for children and adolescents*

Emotional regulation was measured with the emotional regulation questionnaire for children and adolescents (ERQ-CA) developed by Gullone and Taffe [23] and subsequently tested and translated into Portuguese by Teixeira et al. [24]. It consists of 10 items answered on a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree). Of those ten items, six assess strategies of CR, whereas the other four assess strategies of ES. The total score for each scale is the sum of its items, ranging from 6 to 30 for CS and 4 to 20 for ES. The higher the score, the greater the use of that emotion regulation strategy. Reliability analysis in the present sample revealed a Cronbach's alpha of 0.74 for ES and 0.61 for CR.

#### *Brief self-control scale*

Self-control was measured with the brief self-control scale (BSCS) developed by Tangney et al. [25] and subsequently tested and translated into Portuguese by Cruz et al. [26]. It consists of 13 items answered on a 5-point Likert scale ranging from 1 (not at all like me) to 5 (very much like me). The total score was calculated by summing all the items; higher scores indicated higher self-control. Reliability analysis in the present sample revealed a Cronbach's alpha of 0.63.

#### Procedures

This study was conducted in accordance with the ethical guidelines of the Helsinki Declaration and its subsequent revisions. Participants were invited to participate in the study by completing an online survey. After agreeing to participate, athletes were asked to answer the survey on their own devices according to their own personal experiences. Instructions provided intended to reduce possible biases due to social desirability. All participants were informed about the purpose of the research and provided verbal and written consent. Additionally, parents or legal guardians were contacted, debriefed about the study's aims, and provided their written informed consent. Participants were

also informed of the possibility of leaving the study at any point and were ensured the anonymity and confidential nature of their participation. The protocol was approved by the Ethics Committee of the authors' institution.

Analytic strategy

Pearson correlation analysis was used to test the associations between the variables in this study. To further understand the predictive capacity of implicit beliefs, self-control, and emotional regulation strategies, a three-stage hierarchical regression was performed, in which age and sex were included in the first step, implicit beliefs about emotions were introduced in the second step, and self-control and emotions regulation (CR and ES) were entered in the third step. Before conducting the hierarchical regression analysis, a few assumptions were checked. Firstly, one multivariate outlier was removed after examining the Mahalanobis distance. Finally, collinearity statistics, tolerance, and VIF of the predictors were all within the accepted values.

Considering the relatively small sample size, effect sizes were calculated using the  $f^2$  of Cohen for increasing transparency.  $f^2$  of Cohen was calculated with an online tool provided by Soper [27], in which an effect of 0.02 was considered small, 0.15 medium, and 0.35 large. Afterwards, four parallel multiple mediation models were developed to explore further the mediation role of self-control and emotion regulation between implicit beliefs of emotions and the psychological and well-being markers, namely trait anxiety, perceived stress, satisfaction with life, and subjective happiness. Age and sex were added to the mediation models as covariates to remove their confounding effects statistically. The multiple mediator analysis followed Preacher and Hayes's approach and was conducted using the macro they provided for SPSS [28]. The effect of a me-

diator is deemed significant if the bootstrapped confidence interval of the point estimate of the indirect effect through the proposed mediator does not include zero. In this study, the indirect effect estimate was obtained from 5,000 bootstrap samples and bias-corrected and accelerated 95% confidence intervals were calculated.

Results

Descriptive statistics and Pearson correlations

Descriptive statistics and Pearson correlation regarding the variables of the study are presented in Table 1. Overall, self-control and incremental beliefs about emotions were associated with positive outcomes such as positive affect, satisfaction with life, and subjective happiness, in the case of self-control. As for the two emotional regulation strategies, CR was associated with positive affect and subjective happiness. ES was associated with higher anxiety, perceived stress, negative affect, and lower levels of positive affect, satisfaction with life, and subjective happiness.

Hierarchical regression

A summary of the hierarchical regression analysis is presented in Table 2. When predicting, anxiety revealed that sex was a significant predictor,  $F(2,141) = 6.60, p = 0.002$ , explaining 9% of the variance. In the second step, incremental beliefs about emotions were also negative predictors, increasing the variance to 40%,  $F(3,140) = 31.50, p < 0.001$ , Cohen's  $f^2 = 0.52$ . Lastly, self-control was a negative predictor, whereas ES was a positive predictor, explaining a total of 56% of the variance,  $F(6,137) = 28.53, p < 0.001$ , Cohen's  $f^2 = 0.36$ .

Regarding perceived stress, sex was a significant positive predictor in the first step,  $F(2,141) = 5.28$ ,

Table 1. Descriptive statistics and Pearson correlations

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Trait anxiety	44.54	12.64									
2. Perceived stress	30.88	6.73	0.844***								
3. Positive affect	36.58	5.51	-0.409***	-0.296***							
4. Negative affect	27.82	7.21	0.755***	0.652***	-0.287***						
5. Satisfaction with life	23.46	6.50	-0.615***	-0.526***	0.404***	-0.470***					
6. Subjective happiness	3.97	0.80	-0.715***	-0.596***	0.450***	-0.618***	0.667***				
7. Incremental beliefs about emotions	3.29	0.89	-0.619***	-0.509***	0.267**	-0.544**	0.328***	0.411***			
8. Cognitive reappraisal	19.74	3.93	-0.131	-0.105	0.297***	-0.128	0.15	0.265**	0.180*		
9. Expressive suppression	12.55	3.74	0.330***	0.286***	-0.178*	0.228**	-0.248**	-0.431***	0.022	0.01	
10. Self-control	43.46	6.65	-0.331***	-0.229**	0.253**	-0.366***	0.214**	0.189*	0.312***	-0.028	-0.031

\*  $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

Table 2. Hierarchical regression analyses for well-being

	Trait anxiety			Perceived stress			Negative affect			Positive affect			Satisfaction with life			Subjective happiness		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Step 1	$R^2 = 0.09$ ; $\Delta R^2 = 0.09^{**}$			$R^2 = 0.07$ ; $\Delta R^2 = 0.07^{**}$			$R^2 = 0.06$ ; $\Delta R^2 = 0.06^*$			$R^2 = 0.01$ ; $\Delta R^2 = 0.01$			$R^2 = 0.01$ ; $\Delta R^2 = 0.01$			$R^2 = 0.04$ ; $\Delta R^2 = 0.04^*$		
age	-0.65	0.71	-0.07	-0.11	0.38	-0.02	-0.48	0.40	-0.10	-0.10	0.32	-0.03	0.39	0.38	0.09	0.09	0.04	0.17*
sex	6.99	2.03	-0.28***	3.51	1.09	-0.26**	2.98	1.14	0.22*	-0.74	0.91	-0.07	0.78	1.09	0.06	-0.17	0.13	-0.11
Step 2	$R^2 = 0.40$ ; $\Delta R^2 = 0.32^{***}$			$R^2 = 0.28$ ; $\Delta R^2 = 0.21^{***}$			$R^2 = 0.32$ ; $\Delta R^2 = 0.27^{***}$			$R^2 = 0.07$ ; $\Delta R^2 = 0.07^{**}$			$R^2 = 0.13$ ; $\Delta R^2 = 0.12^{***}$			$R^2 = 0.20$ ; $\Delta R^2 = 0.16^{***}$		
incremental beliefs about emotions	-8.30	0.96	-0.58***	-3.60	0.57	-0.47***	-4.19	0.57	-0.53***	1.64	0.52	0.27**	2.65	0.60	0.36***	0.36	0.07	0.41***
Step 3	$R^2 = 0.56$ ; $\Delta R^2 = 0.15^{***}$			$R^2 = 0.40$ ; $\Delta R^2 = 0.12^{***}$			$R^2 = 0.42$ ; $\Delta R^2 = 0.10^{***}$			$R^2 = 0.21$ ; $\Delta R^2 = 0.14^{***}$			$R^2 = 0.20$ ; $\Delta R^2 = 0.07^{**}$			$R^2 = 0.42$ ; $\Delta R^2 = 0.22^{***}$		
self-control	-0.34	0.12	-0.18**	-0.11	0.07	-0.11	-0.25	0.07	-0.24**	0.18	0.07	0.22**	0.10	0.08	0.10	0.01	0.01	0.07
cognitive reappraisal	-0.09	0.19	-0.03	-0.01	0.12	-0.01	-0.11	0.12	-0.06	0.39	0.11	0.28***	0.19	0.13	0.11	0.05	0.01	0.23***
expressive suppression	1.22	0.20	0.36***	0.60	0.12	0.33***	0.42	0.12	0.22**	-0.25	0.11	-0.17*	-0.40	0.14	-0.23**	-0.09	0.01	-0.42***

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Table 3. Direct and indirect effects of the multiple parallel mediation models

	Direct effect	Indirect effect	95% $CI_b$	
			lower	upper
Trait anxiety (OV)		$F(3,140) = 31.50^{***}$ ; $R^2 = 0.40$		
IBE (IV)	-7.334***	-0.963	-2.3256	0.3221
self-control (M)	-0.337**	-0.893	-1.7119	-0.2513
cognitive reappraisal (M)	-0.087	-0.066	-0.5547	0.2401
expressive suppression (M)	1.217***	-0.004	-0.9075	1.0302
Perceived stress (OV)		$F(3,140) = 18.06^{***}$ ; $R^2 = 0.28$		
IBE (IV)	-3.298***	-0.301	-1.0043	0.3242
self-control (M)	-0.109	-0.289	-0.7476	0.0965
cognitive reappraisal (M)	-0.014	-0.010	-0.3318	0.1790
expressive suppression (M)	0.598***	-0.002	-0.4915	0.4871
Subjective happiness (OV)		$F(3,140) = 11.63^{***}$ ; $R^2 = 0.45$		
IBE (IV)	0.304***	0.055	-0.0397	0.1633
self-control (M)	0.009	0.021	-0.018	0.0688
cognitive reappraisal (M)	-0.045***	0.033	-0.0022	0.0976
expressive suppression (M)	-0.087***	0.000	-0.0651	0.0703
Satisfaction with life (OV)		$F(3,140) = 7.15^{***}$ ; $R^2 = 0.13$		
IBE (IV)	2.247**	0.403	-0.1777	1.1271
self-control (M)	0.098	0.260	-0.131	0.7013
cognitive reappraisal (M)	0.189	0.142	-0.0613	0.5672
expressive suppression (M)	-0.399**	0.001	-0.3341	0.3242

IBE – incremental beliefs about emotions, IV – independent variable, M – mediator, OV – outcome variable,  $CI_b$  – bootstrapped 95% confidence interval.

Direct effects: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Indirect effects: confident interval excludes zero

$p = 0.006$ , which explained 7% of the variance. Incremental beliefs of emotions were a negative predictor in the second step,  $F(3,140) = 18.06$ ,  $p < 0.001$ , and increasing the variance to 28%, Cohen's  $f^2 = 0.29$ . Finally, only ES was a positive predictor, explaining overall 40% of the variance,  $F(6,137) = 14.88$ ,  $p < 0.001$ , Cohen's  $f^2 = 0.20$ .

The analysis of negative affect revealed that sex was a positive predictor in the first step,  $F(2,141) = 4.39$ ,  $p = 0.014$ , explaining 6% of the variance. When introducing incremental beliefs of emotions, which were positive predictors, the variance increased to 32%,  $F(3,140) = 22.28$ ,  $p < 0.001$ , Cohen's  $f^2 = 0.38$ . Lastly, self-control was a negative predictor while ES was a positive predictor,  $F(6,137) = 16.67$ ,  $p < 0.001$ , increasing the variance to 42%, Cohen's  $f^2 = 0.17$ .

Furthermore, for positive affect, neither age nor sex were significant predictors,  $F(2,141) = 0.36$ ,  $p = 0.696$ . However, incremental beliefs of emotion contributed positively to the model,  $F(3,140) = 3.63$ ,  $p = 0.015$ , and increased the variance to 7%, Cohen's  $f^2 = 0.06$ . Lastly, self-control and CR were positive predictors, whereas ES was negative,  $F(6,137) = 6.15$ ,  $p < 0.001$ , raising the variance to 21%, Cohen's  $f^2 = 0.18$ .

In terms of satisfaction with life, neither age nor sex were significant predictors in the first step,  $F(2,141) = 0.74$ ,  $p = 0.480$ . Nonetheless, incremental beliefs of emotion were found to be a positive predictor,  $F(3,140) = 7.15$ ,  $p < 0.001$ , with a total variance of 13%, Cohen's  $f^2 = 0.14$ . Lastly, only ES was a negative predictor,  $F(6,137) = 5.86$ ,  $p < 0.001$ , raising the variance to 20%, Cohen's  $f^2 = 0.09$ .

Finally, age was a subjective happiness positive predictor in the first step,  $F(2,141) = 3.11$ ,  $p = 0.048$ , explaining 4% of the variance. Incremental beliefs of emotions were a positive predictor in the second step,  $F(3,140) = 11.63$ ,  $p < 0.001$ , which explained 20% of the variance, Cohen's  $f^2 = 0.20$ . In the third step, both emotion regulation strategies were significant,  $F(6,137) = 16.72$ ,  $p < 0.001$ , increasing the variance to 42%, Cohen's  $f^2 = 0.38$ .

### Mediation analysis

Table 3 shows the direct and indirect effects of all the parallel mediation analyses. All models tested did not present a significant total indirect effect when accounting for all the mediators in the psychological and well-being markers. Nevertheless, total and direct effects were significant for all variables. However, all specific indirect effects were non-significant except for self-control, which presented a significant indirect effect

on trait anxiety. These results suggest that only self-control had a mediating effect on the relationship between incremental beliefs about emotions and trait anxiety. Furthermore, emotional regulation strategies and self-control combined had no mediating effect on the relationship between incremental beliefs about emotions and trait anxiety, perceived stress, subjective happiness, and satisfaction with life.

### Discussion

This study aimed to explore the role of implicit beliefs about emotions, self-control, and emotion regulation on important psychological adjustment markers among youth athletes. It also intended to analyse the potential mediating role of emotional regulation and self-control on the relationships between implicit beliefs about emotions and essential markers of psychological adjustment, namely trait anxiety, perceived stress, satisfaction with life, and subjective happiness.

An overview of the results suggests that beliefs about emotions predicted negative outcomes such as trait anxiety, perceived stress, and negative affect. Indeed, individuals with an entity belief have been shown to have poorer psychological health and well-being than their peers [7]. A malleable mindset towards emotions appears essential for better overall well-being. Nonetheless, believing that emotions are somewhat controllable may not be enough. Despite being positively predicted by incremental beliefs about emotions, positive outcomes were better, or at least similarly, predicted when accounting for emotional regulation strategies and self-control. A study by Castella et al. [29] found similar results in individuals with social anxiety. After controlling for social anxiety, personal beliefs about emotions successfully predicted stress, trait anxiety, and negative affect. However, it was not a significant predictor of life satisfaction or positive affect.

Nonetheless, reappraisal only predicted positive affect and subjective happiness, whereas suppression was a predictor of all the psychological adjustment makers considered in this study. These findings could highlight possible difficulties in reappraisal efficiency and preference towards suppression in this population or that suppression's impact on this population's mental health and well-being is significantly more detrimental when compared with the benefits associated with reappraisal. Concurrent with the literature [e.g., 8], ES significantly predicted psychological distress and poorer subjective well-being.

Furthermore, it is noteworthy that, in the current study, self-control was not a significant predictor of

either life satisfaction or subjective happiness, even though it predicts higher positive affect and lower negative affect and trait anxiety and is a significant mediator in the relationship between incremental beliefs about emotions and trait anxiety. Self-control may improve well-being by controlling one's emotions to minimize bad feelings and/or by prioritizing long-term goals in place of short-term satisfaction [30]. Results from the parallel mediation models showed that despite not being significant, individuals with a more malleable mindset about emotions are more prone to use reappraisal instead of suppression. This idea is in line with the correlation analysis and prior research in the implicit theory of emotion, which suggests that individual beliefs affect strategy selection for emotional regulation [7]. Further investigation must be conducted to confirm that the non-significant indirect effect of CR is caused by the previously hypothesized inefficient use of this strategy. Also, contrary to hypothesized, increases in self-control due to an implicit mindset towards emotions do not significantly affect life satisfaction or subjective happiness. Again, this finding adds to the hypotheses that high self-control negatively affects social relationships and consequently contributes to a lower cognitive well-being or state, self-control time, and/or context-related fluctuation could diminish the importance of self-control towards better well-being.

## Conclusions

The present study added to the research field of youth psychological health and well-being in a post-covid scenario, focusing on the youth athletic population and considering their unique constraints and stressors. Novel findings from this study identified a possible lack of efficacy in CR combined with a preference for ES as a regulatory strategy. Both the inefficient use of reappraisal and the use of suppression could heighten anxiety and consequently decrease well-being. Also, the lack of association between subjective well-being and self-control could be time and/or situation-dependent. Significant positive effects on life satisfaction and happiness may occur later in life. In addition, this study also seems to highlight the important role of implicit beliefs about emotions, which may be a key construct towards understanding how young athletes select regulatory strategies.

Despite its strengths, this study has some limitations that should be acknowledged. First, all the measures were self-reported through an online survey, which introduces potential biases due to common method variance. Self-reported data are subject to various forms

of bias, such as social desirability bias and memory decay, which can influence the reliability of the results. Future studies could benefit from incorporating multiple data sources, such as behavioural observations or physiological measures. Second, the cross-sectional design of this study limits its ability to answer questions about temporal precedence. This is particularly relevant in adolescence, a developmental period characterized by significant changes in beliefs about emotions and emotional regulation. Future research should explore these dynamics using longitudinal designs that analyse changes over time. Additionally, while the sample size was relatively small, it was also heterogeneous in terms of demographic characteristics, including age and gender. This diversity can be seen as a strength in terms of generalisability, but it also poses a limitation. More importantly, implicit beliefs and emotional experiences are highly individual and influenced by several personal and contextual factors [5]. While this study provides valuable insights into how implicit beliefs may influence emotion regulation among young athletes, these findings should be interpreted with caution and not generalized. Therefore, future studies should attempt to include a wider sample of athletes and consider a more consistent distribution across different developmental stages and types of sports.

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## Ethical approval

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the Ethics committee of the Portuguese Faculty of Sports of the University of Porto (approval No.: CEFAD 10 2022).

## Informed consent

Informed consent has been obtained from all individuals included in this study.

## Conflict of interest

The authors state no conflict of interest.

## Disclosure statement

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