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#### Research article

# Psychological readiness of football players for the match and its connection with self-esteem and competitive anxiety

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#### ABSTRACT

For athletes, failure in a match is psychologically difficult. Since the movement abilities of athletes are often comparable, it is assumed that one of the key elements of victory is also their psychological readiness. Many experts recommend rigorously examining all factors affecting the performance of football players, especially in matches. The aim of our study is to determine whether a football player's coping with adversity, coachability, motivation to succeed, goal setting, peaking under pressure, or fear of failure are significantly predicted by their self-esteem or a specific aspect of competitive anxiety, which can be crucial for the direction of psychological preparation in collective sports. The research sample consisted of 107 male football players in the age range of 18-29 years registered with the Slovak Football Association, who actively participated in the team's matches. Football players filled out a booklet of psychological tests, including the Athletic Coping Skills Inventory, the Sport Anxiety Scale, and the Rosenberg Self-Esteem Scale. The results of the regression analysis showed that the self-esteem of football players is a significant predictor of achievement motivation and their ability to listen to the coach's instructions. Along with the somatic component of anxiety, it also predicts goal-setting. Cognitive anxiety of football players, characterized by negative thoughts, turned out to be a significant predictor of coping with adversity during a football match and their peaking under pressure, and together with concentration disruption, it also predicts the ability of football players to free themselves from worries about what the audience thinks about their sporting performance in the match.

# 1. Introduction

A sports competition is a natural completion of the training process, representing a certain burden for athletes [1]. The way of experiencing it is individual for everyone. While some athletes are used to verbalizing the difficulties they encounter, others react to the stressful situation with physical restlessness, tremors, shortness of breath, heart palpitations, excessive sweating, or teeth grinding [1–7]. When an athlete's performance does not progress as planned, their body generally reacts more complexly to the current stressful scenario. It manifests itself in the sphere of emotional experience through fear, anxiety, anger, apathy, experiencing shame or guilt, or depressed moods of athletes [2,8–10], as well as in the sphere of behavior through manifestations of physical aggression, verbal attacks, or hypermobility [11]. Indecisiveness or reduced ambition indicates interference in the sphere of the volitional processes of athletes [12]. Concentration disruption, inaccuracies in memory, and intrusive (obsessive) thoughts, in turn, impact the sphere of cognitive functions of athletes [3,13–15]. Increased muscle tone, restlessness, and abnormalities in movement patterns are examples of

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motor indicators of stress. In addition, from a physiological point of view, there is an increased rate of breathing and pulse, as well as loss of appetite or increased appetite [1-3,12,16]. Although it seems that stress only has a negative impact on the human body, this is not always the case. Such a short-term stress reaction is necessary for the healthy functioning of the body, as it contributes to the acquisition of new skills and abilities, thanks to which athletes can adapt to new environmental conditions [13,17,18]. On the contrary, a long-term or excessive stress reaction has a harmful effect on the body, which can manifest itself in the development of various cardiovascular, neuropsychiatric, or metabolic diseases [2,15,19]. Stress is the individual response of the body to an acting stressor; it is the response of the endocrine, nervous, and immune systems to the exogenous or endogenous load of athletes. Although it is proven that stress accelerates the process of sensorimotor learning of simple tasks to a certain extent, it was found that it has an inhibitory effect on the learning of more complex tasks [12,13]. In addition, other studies have shown that people with lower self-esteem have a much slower recovery from negative events than people with higher self-esteem [20]. Experiencing positive feelings has been found to eliminate the harmful consequences of a negative experience or loss [21]. Since negative feelings often prevail over positive ones in athletes with low self-esteem, they block the reduction of the consequences of a negative experience, which would explain why recovery is longer for these people [3,5]. According to experts, this is also due to the fact that people with low self-esteem are overly concerned with their shortcomings and mistakes, while people with high self-esteem often suppress or even trivialize negative experiences [22]. The goal of the psychological preparation of athletes is therefore to regulate their current psychological state in order to achieve performance at the limit of their maximum, which is also in line with their performance possibilities (short-term psychological preparation) or to form such psychological characteristics in athletes that will enable them to manage various levels of psychological and physical load not only in training but especially in competition (long-term psychological preparation) [13,23,24]. In collective sports, the aim of psychological preparation is also the creation of a compact and cohesive team capable of fulfilling set performance goals, which indicates a difference in the direction of the management of psychological training, which can be manifested at the performance level from the aspect of player positions or gender differences [1,12,25,26]. Research also conducted on a research sample of hockey players, football players, and gymnasts also indicates differences in the level of coping with adversity, peaking under pressure, achievement motivation, concentration, coachability, goal-setting, and freedom from worry [1,3,4].

For athletes, competition in sports is mentally demanding. Since the movement abilities of athletes are often comparable, it is assumed that one of the key elements of victory is also their psychological readiness. Many authors of the study recommend that all factors affecting athletes' performance, especially in competition, be thoroughly investigated [2,3,27-33]. Personality diagnostics allows for the identification of the positive, desired, strong, and weak qualities of an athlete. The development of an athlete's character and experience is connected with learning skills that are useful in coping with the circumstances of the competition [1,3,34]. In addition, the research of many authors shows that the longer an athlete is involved in sports, the more defined his personality is. This provides an opportunity for early psychological preparation, which helps athletes prepare mentally at a younger age and in terms of the difficulty of the given sport [1,35-39]. This statement is also consistent with the research of other authors who found that the desired personality predispositions of team athletes include low levels of neuroticism, high levels of extroversion, and openness to experience [40]. These characteristics should be monitored in the same way as the athlete's achievements, his physical structure and motor skills, or the technical and tactical parameters. Several expert recommendations point to the need to improve the psychological preparation of football players in order to increase their self-esteem and reduce anxiety [1,27,87]. In addition, we do not know to what extent the specificity of the trained sport and coaching could have influenced the formation of the athletes' personalities [41,42]. For this reason, the aim of our research is to find out how different aspects of football players' psychological readiness, self-esteem, and competitive anxiety are related to each other. In addition, to determine whether a football player's coping with adversity, coachability, motivation to achieve success, goal-setting, peak under pressure, or worry of failure are significantly predicted by their self-esteem or a specific aspect of competitive anxiety.

#### 2. Methods

# 2.1. Participants

A total of 114 male football players participated in the psychological research. The conditions for participants' involvement in the research were: a) reaching the age of the majority of football players, i.e. 18+ years, b) registration in the Slovak Football Association, and c) participation in the team's matches, where at the time of data collection they were actively participating in a football match and were able to provide relevant retrospective answers to questions regarding experiencing distress before and during the match. Seven participants' answer sheets were excluded from the evaluation due to non-compliance with the required criteria for participation in the research or errors in their filling. In total, we evaluated 107 answer sheets of football players in the age range of 18-29 years, with an average age of  $22.85 \pm 2.71$ . The length of sports experience of the football players involved in the research was 12 years.

# 2.2. Measures

# 2.2.1. Athletic Coping Skills Inventory

We used the Athletic Coping Skills Inventory ACSI-28 which is a validated research instrument adapted for sports conditions, to determine the psychological readiness of football players for a match. The inventory finds out how football players cope with difficulties in a match that does not develop according to their expectations and also monitors their ability to remain positive in adverse situations. It evaluates the motivation of football players to learn and improve new skills, as well as their effort to give the best sporting performance in the match. Other important factors, such as the level of concentration of attention, the ability to listen to the coach's

instructions and accept constructive criticism, and the set goals that are achievable, also observe the performance of football players under pressure, as well as their fears of failure, loss of prestige, and not meeting the expectations of others. It consists of 28 statements to which the football players answer in the form of a Likert scale (0-almost never to 4-almost always) according to how they identify with the given statement. It has seven subscales in which football players can score from 0 to 12. They can get a total score of 0–84 [7]. Cronbach's alpha based on the classical items analysis was 0.76.

#### 2.2.2. Sport Anxiety Scale

The level of competitive anxiety of football players was measured by the Sport Anxiety Scale, 2nd revised version. The SAS-2 is a research instrument that monitors the anxiety level of athletes before and during competition. As there are not many research instruments, inventories, or scales adapted to the conditions of sport, SAS-2 is a frequently used research tool in many countries around the world. It is based on the multidimensional theory of anxiety and makes it possible to evaluate the cognitive and somatic symptoms of anxiety. It consists of three subscales, monitoring physiological elements of hyperactivation, stiffness, and tension of muscles and stomach problems (a somatic component of anxiety), worries, and fear of failure in sports (a cognitive component of anxiety). It also records the disruption of athletes' attention to the performance of tasks. The scale consists of 15 statements to which football players answer on a linear scale (from 1-not at all to 4-very often), depending on the frequency with which the described events happen to them. High scores on these items indicate high levels of anxiety, and low scores indicate low levels of anxiety [43]. In this study, the internal consistency of SAS-2 reached the value 0.80.

#### 2.2.3. Rosenberg Self-Esteem Scale

To determine the level of self-esteem of football players, we used Rosenberg's self-esteem scale, RSES [44]. We chose the scale because this research tool is often used in the field of sports, which will make it easier to compare the achieved data with the research findings of other authors. It consists of 10 statements to which football players respond using a linear scale (from 1-do not agree at all to 4-completely agree), depending on how much they identify with the statements. Five items are reversed, which is recorded when evaluating the data. The sum of the scales of the item indicates the level of self-esteem of football players, while a high score indicates high self-esteem of football players and a low score indicates low self-esteem [45]. The internal consistency of RSES reached the value 0.75.

#### 2.3. Procedures

The study has a correlational research design, a non-experimental type of quantitative research in which the researcher examines the relationship between variables without controlling or manipulating any of them. Football players filled out a booklet of psychological tests, including the Athletic Coping Skills Inventory (ACSI-28), Sport Anxiety Scale (SMS-2), and Rosenberg Self-Esteem Scale (RSES). The study's author, a sports psychologist with a completed third-degree Ph.D. and ten years of experience in the field, administered the test.

# 2.4. The ethics of research

The project ethics received approval from The Comenius University in Bratislava's Ethics Committee (project code: EK/02/2020) and complied with the Declaration of Helsinki. The study was supported by the Scientific Grant Agency of the Ministry of Education, Science, Research, and Sport of the Slovak Republic (VEGA) with number 1/0786/21. The participants were informed about the purpose of the research and by their written consent they confirmed their voluntary participation in the research, as well as their consent to the use of the obtained data for research purposes.

**Table 1** Descriptive characteristics of research sample (n = 107).

Athletic Coping Skills Inventory	Ranges	M	SD	Min	Max
Achievement Motivation	0–12	7.92	2.18	3	12
Concentration	0–12	7.36	1.87	3	11
Coping with Adversity	0–12	6.94	1.89	2	11
Coachability	0–12	6.22	1.63	2	10
Peaking under Pressure	0–12	5.84	2.84	0	12
Goal-setting	0–12	5.63	2.23	0	11
Freedom from Worry	0–12	4.86	2.21	0	11
Total Athletic Coping Skills	0–84	44.77	8.70	26	64
Sport Anxiety Scale					
Cognitive anxiety	5–20	9.81	3.39	5	19
Somatic anxiety	5–20	8.39	2.37	5	15
Concentration disruption	5–20	5.71	1.55	4	11
Total Competitive Anxiety	15-60	25.14	5.75	15	44
Rosenberg Self-Esteem Scale					
Total Self-esteem	10-40	31.48	4.30	18	39

Legends: M - Mean, SD - Standard Deviation, Min - minimum, Max - maximum.

#### 2.5. Statistical analyses

We analyzed the data using SPSS - Statistical Package for the Social Sciences (version 23 for Windows; IBM, Armonk, NY, USA). A descriptive analysis of the obtained data was performed, including mean (M), standard deviation (SD), minimum (Min), and maximum (Max) values achieved by football players in individual items of inventories and scales (ACSI-28, SAS-2, RSES). The distribution of the data was determined by the Kolmogorov-Smirnov normality test. Using Pearson's correlation analysis, we investigated the relationship between football players' psychological readiness for the match and their self-esteem and competitive anxiety. Regression analysis was used to determine the predictors of selected subscales of football players' psychological readiness for the match. The purpose of the regression analysis was to use independent variables self-esteem and subscales of competitive anxiety whose values are known to predict the value of the dependent value represented by the selected subscales of ACSI-28.

#### 3. Results

Table 1 shows the score (Mean) and standard deviation (SD) of the individual subscales of ACSI-28, SAS-2, and RSES, including the scale range and the minimum and maximum values achieved by football players. Individual subscales are ordered chronologically, from the highest mean score to the lowest.

The results show that in terms of psychological readiness for the match, football players achieved the highest scores out of 12 points in achievement motivation (8/12), concentration (7/12), coping with adversity (7/12), then coachability (6/12), peaking under pressure (6/12), and goal setting (6/12), and the lowest in the freedom from worry subscale (5/12). The results also show that football players scored on average higher in cognitive anxiety (10/20) than in somatic anxiety (8/20), there was minimal disruption of concentration (5/20), and we recorded higher values in the self-esteem of football players (31/40).

In Table 2, the correlation matrix shows a positive relationship between the self-esteem of football players and five of the seven subscales of the players' psychological readiness for the match. A higher level of self-esteem in football players indicates a higher level of achievement motivation, a higher level of attention concentration, and the ability to set goals, have coachability, and cope with adversity during the match. A higher level of somatic anxiety manifested by physiological elements of hyperactivation, stiffness, and tension of muscles, and stomach problems are associated with a lower level of concentration of attention, as well as a reduced ability of football players to peak under pressure and cope with adversity during the match and a higher level of freedom from worry. A higher level of cognitive anxiety in football players, characterized by worries and fear of failure, also indicates a decrease in attention concentration and a lower ability to cope with adversity during the match, similar to somatic anxiety, but it also shows that it increases the ability to goal-setting and freedom from worry. Concentration disruption for football players during the match was positively correlated with freedom from worry and negatively with coping with adversity.

In Table 3, we present the regression model of selected significant subscales of football players' psychological readiness for the match, together with self-esteem, concentration disruption, and somatic and cognitive anxiety as independent variables. The results show that a significant predictor of coping with adversity during the match is cognitive anxiety, characterized by football players' concerns and fear of failure in sports (F (4.784), p < 0.01), which we can predict in 15.8%. Cognitive anxiety is also a predictor of peaking under pressure (F (2.429), p < 0.01), 8.7%. and freedom from worry (F (23.856), p < 0.01), which, together with concentration disruption p < 0.05, is a predictor of freedom from worry of 48.3%. The physiological response of football players, which is part of somatic anxiety, is a significant predictor of goal setting (F (3.092), p < 0.01), which together with self-esteem p < 0.05 predicts this subscale in 10.8%. Self-esteem also proved to be a significant predictor of coachability (F (3.442), p < 0.01), 11.9%, and achievement motivation of football players (F (2.765), p < 0.01), 9.8%.

# 4. Discussion

Fear of failure and persistent tension, accompanied by muscle stiffness or stomach upset, can be the important determinants that inhibit the performance of football players in competition [1,2,18,46–49]. It is necessary to distinguish between cognitive anxiety, formed by negative thoughts and fears, and somatic anxiety, which monitors the physiological elements of athletes' activation [1,7,12, 43,50]. Loss of attention due to distracting environmental influences appears to be an essential determinant of football players' performance, which often leads to trivial mistakes by players and causes rash reactions, often accompanied by bad decisions [1,5,46, 51–53]. Last but not least, the level of self-esteem of football players usually varies depending on the positive or negative reactions of

 Table 2

 Correlation matrix of the variables of self-esteem, competitive anxiety, and psychological readiness of football players for a match.

Variables (n = 107)	SA	CA	CD	SE
Achievement Motivation	-0.12	0.02	-0.18	0.33**
Concentration	-0.24*	-0.25**	-0.19*	0.27**
Coping with Adversity	-0.35**	-0.27**	-0.29**	0.24*
Coachability	0.04	0.17	0.06	0.30**
Peaking under Pressure	-0.30**	-0.08	0.11	0.14
Goal-setting	-0.06	0.22*	0.11	0.22*
Freedom from Worry	0.66**	0.36**	0.40**	-0.13

Legends: n – Research sample, SA – Somatic Anxiety, CA – Cognitive Anxiety, CD – Concetration Disruption, SE – Self-Esteem, \*\*p < 0.05; \*p < 0.01.

**Table 3**Results of regression analysis with selected subscales ACSI-28 as dependent variables and cognitive anxiety, somatic anxiety, concentration disruption, and self-esteem as the independent variables.

R <sup>2</sup> = 0.158; F(4,784)	Coping with Adversity					
	В	SE B	β	t	p	
Cognitive Anxiety	-0.14	0.06	-0.24	-2.28	0.03*	
$R^2 = 0.119$ ; F (3,442)	Coachability					
	В	SE B	β	t	p	
Self-esteem	0.13	0.04	0.34	3.27	0.01**	
$R^2 = 0.098$ ; F (2,765)	Achievement Motivation					
	В	SE B	β	t	p	
Self-esteem	0.16	0.05	0.31	2.91	0.01**	
$R^2 = 0.108$ ; F (3,092)	Goal-setting					
	В	SE B	β	t	p	
Somatic Anxiety	0.24	0.10	0.26	2.54	0.01**	
Self-esteem	0.12	0.05	0.24	2.31	0.02*	
$R^2 = 0.087$ ; F (2,429)	Peaking under Pressure					
	В	SE B	β	t	p	
Cognitive Anxiety	-0.24	0.09	-0.30	-2.58	0.01**	
$R^2 = 0.483$ ; F (23,856)	Freedom from Worry					
	В	SE B	β	t	p	
Cognitive Anxiety	0.40	0.05	0.62	7.33	0.01**	
Concentration disruption	0.24	0.12	0.17	2.01	0 <b>.05</b> *	

Legends: \*p < 0.05; \*\*p < 0.01, B = regression unstandardized coefficient, SE B = standard error,  $\beta$  = regression standardized coefficient, t = t-test result, p = significance, R<sup>2</sup> – coefficient of determination.

the environment, and it is proven that it affects performance in sports [1,3,54,55]. Athletes who surround themselves with people with a positive attitude are demonstrably characterized by a higher quality of social interactions, a higher level of activity, and the ability to experience positive emotions. They are well-organized, persistent, and motivated in activities aimed at achieving a performance goal [34]. Therefore, the purpose of the presented study was to find whether coping with adversity, coachability, motivation to succeed, goal setting, peaking under pressure, or fear of failure is significantly predicted by their self-esteem or a specific aspect of competitive anxiety.

The results of our research show that the cognitive component of anxiety can be a significant predictor of coping with adversity, peaking under pressure, and freedom from worry for football players. Coping can be characterized as the ability of an individual to comply with conditions that currently exceed his adaptive abilities. It is an effort of a behavioral and cognitive nature that is aimed at adapting or overcoming demands that threaten or exceed the individual's resources [56-58]. In sports terminology, this is the ability of athletes to deal with obstacles and learn from mistakes having obsessive negative thoughts, worries, and fear of failure in football players, their ability to cope with adversity is reduced, as is their ability to learn new skills [1,3-5,7]. In addition, it can be proven that stress accelerates the course of sensorimotor learning to a certain extent, but in the case of solving more complex tasks, it has an inhibitory effect [12,59-61]. From the point of view of peaking under pressure and thus in the match, interesting connections and the fact that the competitive performance of hockey players is closely related to cognitive and somatic anxiety. In hockey players, in addition to fear of failure, somatics also manifested themselves. It seems that hockey players experience fear and anxiety on a cognitive level, which from a physiological point of view manifests itself in muscle stiffness, tension, and possible tremors [1–3,5]. In our research with football players, these symptoms of somatic anxiety are absent as significant predictors and remain only at the level of worries and negative obsessive thoughts, i.e., cognitive anxiety as a significant predictor, but they still point to their inherent presence and the need for the development of psychological preparation in football players [1-3,5,62,63]. This information is necessary for coaches to direct athletes in the most favorable and suitable manner. In addition, the coach's lack of knowledge about the specificity of personality characteristics of representatives of various sports can adversely affect the development of the sport of their wards and manifest in ineffective activities [34]. Stressors can be divided according to the type of threat into real ones and those created by the individual through negative thinking, the so-called potential stressors [1,2,64]. This phenomenon in the conditions of sports is quite frequent, therefore, in this context, there is an effort to apply techniques, e.g., reframing, i.e., learning the skill of transforming athletes' negative thoughts into functional positive ones ([12,13,65]. For this reason, a more detailed examination of the cognitive component of athletes' anxiety, which often triggers the body's physiological response (a somatic component of anxiety), is crucial in sports conditions. Adequate implementation of techniques that eliminate the high level of the cognitive component of the variable can, according to our assumptions, help athletes increase their performance in a given type of sport [1-5,88]. This is also in line with research dealing with increasing psychological readiness using yoga exercises [66], meditations [67–70], or using Schultz's autogenic training or Jacobson's progressive relaxation [71–75].

The freedom from worry subscale monitors the extent to which athletes care about what others think about their sports performance ([1,3,5,7]. From the above, it follows that a higher level of cognitive anxiety in football players increases the possibility of fear of loss of prestige and poor sports performance in the competition and also disrupts the attention needed to perform tactical tasks in sports, which is also in line with the findings of other research [1–3]. In addition, the physiological response of the body resulting from somatic anxiety was shown in our research, together with the self-esteem of football players, as an important predictor of goal setting. The correct setting of short-term and long-term goals is crucial for sports practice [1–5,27,76,77]. Setting a shallow goal for the athlete

means that the content of the athlete's preparation for participation in the competition is limited only to the perfection of training in the use of sports techniques and the development of conditioning skills [34]. If an athlete feels regret, sadness, and disappointment after losing a match, according to Higgins' discrepancy theory, this can be explained precisely by the discrepancy between the actual and the ideal "self" [49,78,79]. If the athlete's performance in the competition is lower than his aspirational level, it represents a certain form of failure for the athlete, fueled by the emotions of hopelessness, regret, and sadness [2,3]. The athlete experiences insufficient satisfaction with the need for success or coping with a critical situation as frustration, i.e., failure, or deprivation, the so-called hardship [13]. The self-esteem of football players has also been shown to be a significant predictor of achievement motivation, characterized by the ability to learn new skills in order to perform at their best, as well as coachability, i.e., the ability of football players to listen to the coach's instructions and accept criticism without getting upset [1-5,7]. The results of our research show that the achievement motivation of football players depends to a large extent on how football players evaluate themselves and how they generalize information obtained through social comparison [3,5,45,80,81]. The higher the self-esteem of football players, the higher the assumption of higher achievement motivation. Football players who believe in their abilities and are not afraid to face obstacles are more predisposed to face imaginary pressure from the environment and perform optimally in sports [3,13,81]. Self-evaluation is the result of two evaluation processes social comparison and self-assessment of one's own activity [45]. A high level of self-evaluation reflects a positive attitude toward oneself, while a low level of self-evaluation indicates a higher tendency to question oneself [82]. In the conditions of sports, a low level of self-evaluation is undesirable, as it increases the sensitivity of athletes to conflict or unfair situations in sports [27,83]. Even the conflict between the coach and the athletes can hinder their performance and subsequently contribute to a decrease in their self-esteem [12,84–86]. The relationship between the coach and athletes is an important factor stimulating or inhibiting sports performance and an important predictor of the ability to follow the coach's instructions without affecting the individual and interfering with the formation of the self-image [1,3].

The results of our research indicate that the short-term and long-term psychological preparation of team sports athletes, in this case football players, should be oriented towards increasing their self-esteem, which could significantly help increase their achievement motivation as well as their goal-setting ability, and it would also contribute to better coping with criticism from the environment. Activities aimed at reducing the cognitive component of anxiety could be helpful in the direction of better coping with adversity and providing optimal performance in competitive conditions, as well as in reducing the fears of football players about the loss of prestige or concerns about the termination of a professional contract [1].

#### 4.1. Limitations

Psychological research carried out on a research sample of football players also has certain limitations. Due to easier availability, only male football players were included in the research. We would recommend carrying out this research on female participants, which can bring valuable results and recommendations. Among other factors that could have influenced the results of the research are demographic, economic, and performance factors. In addition, it is necessary to take into account the previous experience of the investigated football players from earlier periods of their sports career and the influence of long-term sports training on possible modifications of personality traits, which we recommend taking into account in the following research, including gender differences or player positions.

# 5. Conclusions

The results of this study showed that self-esteem, somatic and cognitive anxiety, and concentration disruption are significant predictors of the psychological readiness of football players. It seems that psychological preparation oriented towards increasing self-esteem and reducing competitive anxiety among football players has the potential to contribute to increasing the ability of football players to cope with adversity during the match, can bring about improvements in the selective focus of the athletes' attention on key game tasks, and can contribute to diverting attention from unwanted distracting environmental influences. It also has the potential to contribute to improvements in goal setting, which are often marked by athletes' unrealistic wishes and underestimating or overestimating their mental or physical strengths. Similarly, properly targeted short-term or long-term psychological preparation can bring progress in the field of handling constructive criticism and help athletes get rid of negative thoughts causing emotional discomfort and manifesting as persistent tension, muscle stiffness, shortness of breath, heart palpitations, excessive sweating, or stomach upset. Last but not least, the athletes' motivation and overall performance under pressure in the match can increase their achievement. In addition, correctly oriented psychological preparation for team sports can have a positive effect on the athletes' better awareness of emotions, thereby ensuring their more detailed interpretation and the use of more personalized psychological approaches, methods, and techniques. Also, the starting points of this study can be helpful to coaches and other members of the professional team of athletes in using a more effective method of constructive criticism or support, which is also extremely important for athletes.

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# Data availability statement

Data included in article/supp. material/referenced in article.

#### CRediT authorship contribution statement

**Adriana Kaplánová:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

### **Declaration of competing interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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#### References

- [1] A. Kaplánová, Financial awards and their effect on football players'anxiety and coping skills, Front, Psychol, 11 (2020) 1148.
- [2] A. Kaplánová, Competitive anxiety, guilt and shame proneness from perspective type D and non-type D football players, Front. Psychol. 12 (2021) 601812.
- [3] A. Kaplánová, Self-esteem, anxiety and coping strategies to manage stress in ice hockey, Acta Gymnica 49 (1) (2019) 10-15.
- [4] A. Kaplánová, Personality of gymnasts and coping strategies to manage stress, Science of Gymnastics Journal 11 (2) (2019) 255-265.
- [5] A. Kaplánová, Anxiety of football players and their coping strategies to manage stress, in: C. Torrents, E.M. Sebastiani (Eds.), Sport Physical Education and Performing Arts as Tools of Social Transformation, Inde Publicaciones, Barcelona, 2019, pp. 279–281.
- [6] K. Fransen, N. Vanbeselaere, B. De Cuyper, G. Vande Broek, F. Boen, The myth of the team captain as principal leader: extending the athlete leadership classification within sport teams, J. Sports Sci. 32 (14) (2014) 1389–1397.
- [7] R.E. Smith, R.W. Schutz, F.L. Smoll, J. Ptacek, Development and validation of a multidimensional measure of sport-specific psychological skills: the athletic coping skills inventory 28, J. Sport Exerc. Psychol. 17 (1995) 379–398.
- [8] G. Yu, K.-F. Chang, L-T. Shih, An exploration of the antecedents and mechanisms causing athletes' stress and twisties symptom, Heliyon 8 (10) (2022) e11040.
- [9] J. Schlax, J. Wiltink, M. Beutel, T. Münzel, N. Pfeiffer, P. Wild, M. Blettner, J.G. Kerahrodi, M. Michal, Symptoms of depersonalization/derealization are independent risk factors for the development or persistence of psychological distress in the general population: results from the Gutenberg health study, J. Affect. Disord. 273 (2) (2020) 41–47.
- [10] C.E. Waugh, E.H.W. Koster, A resilience framework for promoting stable remission from depression, Clin. Psychol. Rev. 41 (2015) 49-60.
- [11] R. Yang, F. Yi, C. Tsai, The impact of mental skills training on sports performance, J Leisure Sports Manag 1 (2015) 8-19.
- [12] T. Gregor, Psychológia Športu [Psychology of Sport], Bratislava: Mauro Slovakia, 2013.
- [13] A. Kaplánová, T. Gregor, Využitie kognitívnej techniky reframing v psychologickej príprave športovcov [Utilization of cognitive technique reframing in psychological training of athletes], Telesná výchova a šport 29 (2) (2019).
- [14] E. Peper, J. Aita, Winning the gold in weightlifting using biofeedback, imagery, and cognitive change, Biofeedback 45 (4) (2017) 77-82.
- [15] L. Lagos, E. Vaschillo, B. Vaschillo, P. Lehrer, M. Bates, R. Pandina, Heart rate variability biofeedback as a strategy for dealing with competitive anxiety: a case study, Biofeedback 36 (3) (2008) 109–115.
- [16] M. Dalecki, D.J. Gorbet, A. Macpherson, L.E. Sergio, Sport experience is correlated with complex motor skill recovery in youth following concussion, Eur. J. Sport Sci. 19 (9) (2019) 1–10.
- [17] D. Bourdas, I. Mitrousis, E. Zacharakis, A. Travlos, Home-audience advantage in basketball: evidence from a natural experiment in EuroLeague games during the 2019-2021 Covid-19 era, Journal of Physical Education ans Sport 22 (6) (2022) 1553–1563.
- [18] R.A. Philippe, A. Schiavio, M. Biasutti, Adaptation and destabilization of interpersonal relationships in sport and music during the Covid-19 lockdown, Heliyon 6 (10) (2020) e05212.
- [19] J.H. Gruzelier, T. Thompson, E. Redding, R. Brandt, T. Steffert, Application of alpha/theta neurofeedback and heart rate variability training to young contemporary dancers: state anxiety and creativity, Int. J. Psychophysiol. 93 (1) (2014) 105–111.
- [20] C. Sedikides, E.A. Rudich, A.P. Gregg, M. Kumashiro, C. Rusbult, Are normal narcissists psychologically healthy? Self-esteem matters, J. Pers. Soc. Psychol. 87 (3) (2004) 400-416
- [21] V. Zeigler-Hill, The importance of self-esteem, in: V. Zeigler-Hill, J. Jordan, J.J. Cameron (Eds.), Self-esteem, Psychology Press, London, England, 2013, pp. 1–20.
- [22] P.G. Dodgson, J.V. Wood, Self-esteem and the cognitive accessibility of strengths and weaknesses after failure, J. Pers. Soc. Psychol. 75 (1) (1998) 178–197.
- [23] A.L. McPherson, J.A. Feller, T.E. Hewett, K.E. Webster, Psychological readiness to return to sport is associated with second anterior cruciate ligament injuries, Am. J. Sports Med. 47 (14) (2019) 857–862.
- [24] J. Hammermeister, S. VonGuenthner, Sport psychology: training the mind for competition, Curr. Sports Med. Rep. 4 (3) (2005) 160–164.
- [25] J. Berastegui-Martínez, J.C. Lopez-Ubis, Effects of an intervention programme designed to improve emotional intelligence and foster the use of coping strategies among professional female football players, Heliyon 8 (7) (2022) e09860.
- [26] A. Kruger, A. Pienaar, Gender differences in the sport psychological skills profile of adolescent sport participants, Int. Sportmed J. (ISMJ) 15 (4) (2014) 474–482.
- [27] A. Kaplánová, T. Gregor, Sebahodnotenie tenistov a ich vzťah k citlivosti voči nespravodlivosti [Self-esteem of tennis players and their relation to sensitivity to injustice], Telesná výchova a šport 28 (1) (2018).
- [28] V. Vadovičová, P. Petrovič, T. Gregor, A. Kaplánová, Hudba ako faktor ovplyvňujúci koncentráciu športového strelca a jeho výkon [Music as a factor influencing sport shooter's concentration and performance, in: M. Merica, M. Belešová (Eds.), Žiak, Pohyb, Edukácia, Bratislava: Univerzita Komenského v Bratislave, 2021, pp. 189–200.
- [29] M. Wälti, J. Sallen, M. Adamakis, F. Ennigkeit, E. Gerlach, C. Heim, B. Jidovtseff, I. Kossyva, J. Labudová, D. Masaryková, R. Mombarg, L.S. Morgado, B. Niederkofler, M. Niehues, M. Onofre, U. Pühse, A. Quitério, C. Scheuer, H. Seelig, P. Vlček, J. Vrbas, C. Herrmann, Basic motor competencies of 6- to 8-year-old primary school children in 10 european countries: a cross-sectional study on associations with age, sex, body mass index, and physical activity, Front. Psychol. 13 (2022) 804753.
- [30] P.A. Piepiora, K. Witkowski, Personality profile of combat sports champions against neo-gladiators, Arch. Budo 16 (2020) 281–293.

- [31] P.A. Piepiora, J. Maśliński, R. Gumienna, W.J. Cynarski, Sport technique as a determinant of athletes' personality, Qual. Sport 6 (2020) 33-43.
- [32] P.A. Piepiora, E. Kaźmierczak, K. Witkowski, Personality of male and female practising competitive football, Arch. Budo 16 (2020) 127-135.
- [33] M.E. Nia, M.A. Besharat, Comparison of athletes' personality characteristics in individual and team sports, Procedia. Soc. Behav. Sci. 5 (2010) 808–812.
- [34] P.A. Piepiora, Assessment of personality traits influencing the performance of men in team sports in terms of the big five, Front. Psychol. 12 (2021) 679724.
- [35] J. Labudová, T. Gregor, A. Kaplánová, Ľ. Zbončák, Osobnostné a motivačné vlastnosti výkonnostných pretekárok v synchronizovanom plávaní [Personality and motivational characteristics of synchronized swimmers], in: M. Merica, M. Belešová (Eds.), Žiak, Pohyb, Edukácia. 1. Vyd, Univerzita Komenského v Bratislave, Bratislava, 2022, pp. 233–246.
- [36] E. Grznár, D. Sucháň, J. Labudová, L. Odráška, I. Matúš, Influences of breathing exercises and breathing exercise combined with aerobic exercise on changes in basic spirometry parameters in patients with bronchial asthma, Appl. Sci. 12 (14) (2022) 7352.
- [37] M. Merica, R. Osadan, L. Koreňová, J. Gunčaga, Approaches and relationship to health and healthy lifestyle of university female students, Journal of Interdisciplinary Research 9 (1) (2019) 186–190.
- [38] A. Mirzaei, R. Nikbakhsh, F. Sharififar, The relationship between personality traits and sport performance, Eur. J. Exp. Biol. 3 (2013) 439-442.
- [39] P. Steca, D. Baretta, A. Greco, M. D'Addario, D. Monzani, Associations between personality, sports participation and athletic success. A comparison of Big Five in sporting and non-sporting adults, Pers. Indiv. Differ. 121 (2018) 176–183.
- [40] P.A. Piepiora, Z. Piepiora, J. Bagińska, Personality and sport experience of 20–29-year-old polish male professional athletes, Front. Psychol. 13 (2022) 854804.
- [41] S. Harvey, S. Pill, P.A. Hastie, T.L. Wallhead, Physical educators' perceptions of the successes, constraints, and possibilities associated with implementing the sport education model, Phys. Educ. Sport Pedagog. 25 (2020) 555–566.
- [42] T.L. Wallhead, P.A. Hastie, S. Harvey, S. Pill, Academics' perspectives on the future of sport education, Phys. Educ. Sport Pedagog. 26 (2021) 533-548.
- [43] R.E. Smith, F.L. Smoll, S.P. Cumming, J.R. Grossbard, Measurement of multidimensional sport performance anxiety in children and adults: the sport anxiety scale-2, J. Sport Exerc. Psychol. 28 (2006) 479–501.
- [44] M. Rosenberg, Society and the Adolescent Self-Image, Princeton University Press, Princeton, NJ, 1965.
- [45] M. Blatný, L. Osecká, Zdroje sebehodnocení a životní spokojenosti: osobnost a strategie zvládaní [Sources of self-evaluation and life satisfaction: personality and coping strategies], Československá Psychol. 42 (1998) 385–394.
- [46] M. Gómez-López, C.C. Borrego, C.M. Silva, A. Granero-Gallegos, J.G. Hernández, Effects of motivational climate on fear of failure and anxiety in ten handball players, Int. J. Environ. Res. Publ. Health 17 (2) (2020) 1–12.
- [47] S. Sagar, B.K. Busch, S. Jowett, Success and failure, fear of failure, and coping responses of adolescent academy football players, J. Appl. Sport Psychol. 22 (2) (2010) 213–230.
- [48] E. Bhambri, P.K. Dhillon, S.P. Sahni, Effect of psychological interventions in enhancing mental toughness dimensions of sports persons, J. Indian Acad. Appl. Psychol. 31 (1–2) (2005) 65–70.
- [49] P.J. Silva, T.S. Duval, Objective self-awareness theory: recent progress and enduring problems, Pers. Soc. Psychol. Rev. 5 (3) (2001) 230–241.
- [50] L.D. Godoy, M.T. Rossignoli, P. Delfino-Pereira, N. Garcia-Cairasco, E.H. de Lima Umeoka, A Comprehensive overview of stress neurobiology: basic concepts and clinical implications, Front. Behav. Neurosci. 12 (2018) 127.
- [51] Komarudin, H.A. Hermawan, Saryono, C.N. Guntur, Wali, K.W. Rochmani, The Relationship between excitement and anxiety on the performance soccer athletes, Journal of Positive School Psychology 6 (2022) 6.
- [52] E.V. Vliet, E.I. Yuba, Decision-making by extreme athletes: the influence of their social circle, Heliyon 7 (1) (2021) e06067.
- [53] J. González-Hernández, C.M. Silva, D. Monteiro, M. Alesi, M. Gómez-López, Effects of commitment on fear of failure and burnout in teen Spanish handball players, Front. Psychol. 12 (2021) 640044.
- [54] B.N. Leitzelar, S. Razon, U. Tokac, S. Dieringer, C. Book, L.W. Judge, Effects of a supportive audience on a handgrip squeezing task in adults, Int J Exerc Sci 9 (1) (2017) 4–15.
- [55] S.E. Taylor, T.E. Seeman, N.I. Eisenberger, T.A. Kozanian, A.N. Moore, W.G. Moons, Effects of a supportive or an unsupportive audience on biological and psychological responses to stress, J. Pers. Soc. Psychol. 98 (1) (2010) 47.
- [56] D. Meyer, T.E. Van Rheenen, E. Neill, A. Phillipou, E.J. Tan, W.L. Toh, P.J. Sumner, S.L. Rossell, Surviving the COVID-19 pandemic: an examination of adaptive coping strategies, Heliyon 8 (5) (2022) e09508.
- [57] D. Munoz-Violant, V. Violant-Holz, M.G. Gallego-Jimenez, M.T. Anguera, M.J. Rodriguez, Copin strategies patterns to buffer the psychological impact of the state of emergency in Spain during the COVID-19 pandemic's early months, Sci. Rep. 11 (1) (2021).
- [58] T. Heffner, T. Willoughby, A count of coping strategies: a longitudinal study investigating an alternative method to understanding coping and adjustment, PLoS One 12 (10) (2017).
- [59] N. Kocsel, Z. Horváth, M. Reinhardt, E. Szabó, G. Kökönyei, Nonproductive thoughts, somatic symptoms and well-being in adolescence: testing the moderator role of age and gender in a representative study, Heliyon 8 (6) (2022) e09688.
- [60] C. Ottaviani, J.F. Thayer, B. Verkuil, A. Lonigro, B. Medea, A. Couyoumdjian, J.F. Brosschot, Physiological concomitants of perseverative cognition: a systematic review and meta-analysis, Psychol. Bull. 142 (3) (2016) 231–259.
- [61] E. Watkins, Constructive and unconstructive repetitive thought, Psychol. Bull. 134 (2) (2008) 163-206.
- [62] Y.A. Balk, C. Englert, Recovery self-regulation in sport: theory, research, and practice, Int. J. Sports Sci. Coach. 15 (2) (2020).
- [63] I.A. Jeffreys, Multidimensional approach to enhancing recovery, Strength Condit. J. 27 (5) (2005) 78-85.
- [64] K. Paulík, Psychologie Lidské Odolnosti [The Psychology of Human Resilience], Grada, Praha, 2010.
- [65] L.K. Truong, A.D. Mosewich, M. Miciak, A. Pajkic, C.Y. Le, L.C. Li, J.L. Whittaker, Balance, reframe, and overcome: the attitudes, priorities, and perceptions of exercise-based activities in youth 12-24 months after a sport-related ACL injury, J. Orthop. Res. 40 (1) (2021) 170–181.
- [66] A.W. Li, C.A. Goldsmith, The effects of yoga on anxiety and stress, Alternative Med. Rev. 17 (1) (2012) 21–35.
- [67] R.A. Philippe, L. Schwab, M. Biasutti, Effects of physical activity and mindfulness on resilience and depression during the first wave of covid-19 pandemic, Front. Psychol. 12 (2021) 700742.
- [68] F. Travis, J. Shear, Focused attention, open monitoring and automatic self-transcending: categories to organize meditations from vedic, buddhist and chinese traditions, Conscious. Cognit. 19 (4) (2010) 1110–1118.
- [69] A. Lutz, H.A. Slagter, J.D. Dunne, R.J. Davidson, Attention regulation and monitoring in meditation, Trends Cognit. Sci. 12 (4) (2008) 163-169-
- [70] P. Grossman, L. Niemann, S. Schmidt, H. Walach, Mindfulness-based stress reduction and health benefits: a meta- analysis, J. Psychosom. Res. 57 (1) (2003) 35-43
- [71] L. Rivera, N. Ozamiz-Etxebarria, M. Dosil-Santamaría, L. Rivera-Monterrey, Autogenic training improves the subjective perception of physical and psychological health and of interpersonal relational abilities: an electronic field survey during the COVID-19 crisis in Spain, Front. Psychol. 12 (2021) 616426.
- [72] M.P. Ramirez-García, J. Leclerc-Loiselle, C. Genest, R. Lussier, G. Dehghan, Effectiveness of autogenic training on psychological well-being and quality of life in adults living with chronic physical health problems: a protocol for a systematic review of RCT, Syst. Rev. 9 (1) (2020) 74.
- [73] N. Sakhare, K. Sharma, A. Syal, Effect of progressive muscular relaxation technique and autogenic relaxation technique on pre competitive state anxiety and self confidence in athletes, International Journal of Advance Research, Ideas and Innovations in Technology 4 (6) (2018) 403–410.
- [74] J. Hašto, Autogénny Tréning. Nácvik Koncentratívneho Sebauvoľnenia [Autogenic Training, in: Concentrative Self-Release Training]. 4. Vyd, Vydavateľstvo F, Bratislava, 2018.
- [75] B. Hoffmann, Handbook Autogenes Training, Deutscher Taschenbuch Verlag dtv, Frankfurt, 2017.
- [76] J. Taylor, J.C. Wilson, Using our understanding of time to increase self-efficacy towards goal achievement, Heliyon 5 (8) (2019) e02116.
- [77] R.R. Bailey, Goal setting and action planning for health behavior change, Am. J. Lifestyle Med. 13 (6) (2017) 615-618.
- [78] L. Wasylkiw, L.R. Fabrigar, S. Rainboth, A. Reid, C. Steen, Neuroticism and the architecture of the self: exploring neuroticism as a moderator of the impact of ideal self-discrepancies on emotion, J. Pers. 78 (2) (2010) 471–492.

[79] E.T. Higgins, J. Shah, R. Friedman, Emotional responses to goal attainment: strength of regulatory focus as moderator, J. Pers. Soc. Psychol. 72 (3) (1997) 515–525

- [80] K. Watanabe, N. Saijo, S. Minami, M. Kashino, The effects of competitive and interactive play on physiological state in professional esports players, Heliyon 7 (4) (2021) e06844.
- [81] M. Mateo, C. Blasco-Lafarga, I. Martinez-Navarro, J.F. Guzman, M. Zabala, Heart rate variability and pre-competitive anxiety in BMX discipline, Eur. J. Appl. Physiol. 112 (1) (2012) 113–123.
- [82] M. Vágnerová, Vývojová Psychologie: Dětství, Dospělost, Stáří [Developmental Psychology], Portál, Praha, 2000.
- [83] A. Kaplánová, Individual differences of sensitivity of tennis players to injustice situations from the perspective of the five-factor model of personality big five theory, Acta Gymnica 48 (1) (2018) 21–26.
- [84] D.F. Gucciardi, S. Gordon, Mental Toughness in Sports: Developments in Theory and Research, Routledge, Oxon, 2011.
- [85] B.W. Miller, G.C. Roberts, Y. Ommundsen, Effect of motivational climate on sportpersonship among competitive youth male and female football players, Scand. J. Med. Sci. Sports 14 (3) (2004) 193–202.
- [86] L.N. Holt, J.M. Hogg, Perceptions of stress and coping during preparations for the 1999 women's soccer World Cup finals, Sport Psychol. 16 (3) (2002) 251–271.
- [87] B. Singh, T. Olds, R. Curtis, et al., Effectiveness of physical activity interventions for improving depression, anxiety and distress: an overview of systematic reviews, Br. J. Sports Med. 57 (2023) 1203–1209.
- [88] M. Vičar, Self-confidence, commitment and goal-setting in Czech athletes at different performance levels, Acta Gymnica 48 (2018) 130-137.