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The Influence of Cognitive Emotion Regulation on Mental Resilience in Elite Athletes in Slovakia

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Abstract

Mental toughness – resilience, is a key factor influencing athletic performance. Its development is an integral part of athletes' mental preparation, contributing to stress management, emotion regulation and more effective overcoming of failure. The aim of this study was to analyze the level of mental resilience of Slovak elite athletes depending on gender and type of sport activity, to find out the preference of specific cognitive-emotional coping strategies and to analyze the predictive influence of cognitive emotion regulation on their mental resilience. The research population consisted of 208 Slovak elite athletes (AM = 24.5; SD = 4.18) aged 18-39 years from different sport industries. Resilience was measured with the standardized CD-RISC questionnaire (Connor, Davidson, 2003), with the overall score reaching average values. Results indicated significant gender differences in favor of males in the overall resilience score as well as in the Hardiness and Self-efficacy factors. Significantly higher levels of resilience were found in individual athletes and the assumption of a positive association between duration of sport activity and resilience was confirmed ($r_s = .389$; $p = .032$). The highest average scores in cognitive regulation were found in athletes, and the lowest in karate athletes. Gender differences were evident in significantly higher preference for Self-Blame and Acceptance strategies in female athletes. The overall rate of cognitive emotion regulation was significantly higher in athletes engaged in group sports, in contrast to the higher preference for positive restructuring by individual athletes. Regression analysis confirmed that cognitive emotion regulation is a significant predictor of the overall level of mental resilience in elite athletes. The proposed model explained 32.3 % of the variability in resilience, confirming the important role of cognitive strategies in building athletes' mental resilience. The results of this study provide valuable insights into the psychological factors influencing the performance of elite athletes and establish a foundation for further research in this area.

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1. Introduction

Stress, anxiety, and tension are an integral part of human life, and these emotional states are also significant determinants of athletic performance. In connection with excessive burden, its terminological equivalent is stress, which can be simply defined as the body's response to stressors or a person's overall internal state (Křivohlavý, 1994). At the beginning of all neurochemical and neurophysiological processes that occur during a stress response is the behavioral inhibition center, which is based on the locus coeruleus and nucleus raphae responsible for the orientation response and assessment of the degree of danger of a new situation. These functional structures respond to unknown stimuli, danger signals, pain, but also frustration (when expected responses are missing), etc. These circumstances are referred to as stressors, i.e., stress triggers. If the situation appears threatening, a cascade of alarm reactions is triggered (Večeřová-Procházková, Honzák, 2008). Stressors are therefore stress triggers, which Švingalová (2000) characterized as adverse chemical, physical, or psychosocial life factors. These are all stimuli that an individual perceives and interprets as threatening to their life or integrity.

In the last decade, sports psychology has focused on examining various sources and causes of stress – events, demands, and situations that athletes perceived and evaluated as stressful, since the evaluation of a situation determines whether it will act as a stressor on the athlete or whether they will be able to cope with it relatively easily through adaptive and executive strategies (Fletcher et al., 2012; Leprince et al., 2018). Fletcher et al. (2006) distinguish three categories of stressors in elite athletes – stressors directly related to the competition situation (injury, recovery from injury, competition for a medal, etc.), organizational stressors based on the athlete-environment relationship (changes in training methods, coach, interpersonal conflicts, etc.), and personal stressors (lifestyle changes, financial problems, responsibilities outside of sports – school, work, etc.). Anshell and Wells (2000) identified categories of stressors in team sports – interpersonal conflicts, referees' decisions, personal performance issues, opposing influences from opponents, and team atmosphere.

Stress in the lives of athletes can have both a positive effect (as a facilitating and motivating factor) and a negative effect, hindering the athlete's performance. Many top athletes who have experienced failure due to increased stress describe the phenomenon of "choking under pressure," which has been the subject of research by sports psychologists around the world. Choking under pressure in sports is a strong feeling of failure on the part of the athlete who is unable to adapt to increased stress when it is needed (in competition) and therefore fails to perform as expected and, on the contrary, performs below average (Mesagno, Beckmann, 2017). In addition to the above, athletes struggle with pressure from their surroundings (fans, coaches, audiences) and personality traits (performance motivation, low self-confidence, current level of aspiration, etc.), which subsequently influence the process of adaptation and coping. Adaptation in athletes involves assessing stressors, developing emotional, cognitive and behavioral responses, and adapting to these conditions through automatic self-regulatory processes as well as through rational and planned behavior (Tamminen et al., 2014). These are processes in which the athlete evaluates the intensity of stressors and then adapts to these changes (coping strategies). Coping is then defined as cognitive and behavioral efforts aimed at coping with demands that the individual evaluates as threatening or exceeding their personal coping resources. The stress coping strategies used by athletes often employ emotional regulation strategies, which Martinet et al. (2015) define as a process in which athletes influence their own emotional experience and decide for themselves which emotions they experience and how they respond to them. According to Kaya (2016), resilience is the ability to flexibly return to the state of balance in which a person was before experiencing a strong stressful situation on an emotional level, there is no doubt that resilience closely corresponds to the ability to effectively regulate emotions. Therefore, resilience can be understood as a salutoprotective factor that modifies and improves a person's response to stress (Fletcher, Sarkar, 2013).

The issue of resilience – mental toughness – has received considerable attention in the field of sports psychology. Wald et al. (2006) understand resilience as positive adaptation or the ability to maintain or regain mental balance despite experiencing negative emotions. Positive adaptation to change and negative life situations is one of the key abilities influencing optimal athletic performance. However, an athlete's success is not only influenced by a positive mindset, physical

fitness, or adaptability. Collins and MacNamara (2012) emphasize the direct proportional relationship between the number of problems an athlete faces during their life and their performance. Athletes form a specific group of respondents, with different stressors and events significant for their level of resilience. An important factor in the perception and evaluation of stressors, as well as in the selection of an appropriate coping strategy, is the personality trait of hardiness. Hardiness is a trait that supports transformational coping, which is focused on restructuring stressful situations. The athlete is then able to perceive the situation as a challenge rather than a threat. According to Maddi (2006), the development of hardiness enables the development of resilience in stressful conditions, leading to active coping and the creation of a certain mental toughness in the athlete.

Connaughton et al. (2008) pointed out that once a certain level of mental resilience has been established, three mechanisms are necessary to maintain this state: the desire and motivation to succeed, self-support, and the effective use of one's mental abilities. The most significant findings of the research by Nezhada et al. (2010), which focused on analyzing the connections between resilience and hardiness and their links to mental health and athletic performance, show that both of these constructs positively predict changes in an athlete's mental health and performance. Kiliç (2020) sought to determine the relationship between psychological resilience and stress coping strategies in karate practitioners, finding that the perception of resilience was higher in men than in women and that there is a relationship between experience and the perception of resilience. Furthermore, the research also showed a positive relationship between resilience and stress coping styles. The results of research focused on analyzing the significance of differences in resilience in terms of contextual variables such as type of sport, gender, age, or level of sporting activity showed that the level of resilience is not conditioned by the type of sport or level of sporting activity. However, resilience in this study was conditioned by the age and gender of the respondents. Its overall level was higher in men and positively correlated with age, which is consistent with various studies and sports focuses (Cowden et al., 2016; Zurita-Ortega et al., 2017; Kivrak, Akandere, 2019; Kiliç, 2020; Blanco-García et al., 2021; Patsiaouras, 2021). Resilience in athletes is not only formed by internal but also external sources. Among the most important of these are coaches and their relationships with athletes. The coach-athlete relationship is one of the fundamental pillars of building resilience in sport. Raanes et al. (2019) focused on analyzing the benefits of a functioning relationship between athletes and coaches, as well as the benefits of mental resilience and stress perception in relation to burnout syndrome. Their findings show an inversely proportional relationship between the likelihood of burnout and resilience, as well as the quality of the athlete-coach relationship. Sheikh (2015), in his analysis of differences in resilience levels between individual and team athletes and non-athletes, did not confirm their existence, which is, however, contrary to the research of other authors (Tugade, Fredrickson, 2004; Jalili, Hosseinchari, 2011, etc.), who have shown that athletes exhibit higher resilience than the non-athletic group and that the development of resilience is supported by participation in competitions. Sheikh's (2015) research partially corresponds with the research of Reche-García et al. (2020), according to which there is no difference in resilience between team and individual sports, but the authors found a significant difference in the degree of resilience in combat sports. In the case of emotional regulation, there are probably certain gender differences in the use of specific strategies. Balzarotti et al. (2016) found that women prefer strategies of constantly thinking about the negative emotions associated with the problem and thinking about the worst alternatives. Costa et al. (2020) came to similar conclusions, adding a focus on the reality of the situation, in which female athletes showed a higher preference, while male athletes preferred a planning strategy. In the case of the analysis of coping strategy preferences, male athletes primarily use active coping, planning, positive reappraisal, and acceptance strategies. Conversely, the least frequently used strategies were psychoactive substance use, behavioral disengagement, denial, and religiosity (Dias et al., 2010). Several studies confirm that athletes primarily use problem-focused and emotional coping strategies (Gould et al., 1993; Nichols et al., 2005; Nichols et al., 2006). This indicates a certain flexibility in the choice of coping strategy. According to Dias et al. (2010), athletes prefer problem-focused strategies in situations of high performance, while emotional regulation is preferred in situations of stressors beyond the athlete's control. The effectiveness of coping strategies therefore probably depends on the stressor and the circumstances affecting the athlete's performance. Since resilience is one of the key factors influencing athletic performance and given that a large number of similarly focused studies have been conducted outside of elite sports in

Slovakia, we decided to analyze the level of resilience, its factors, and cognitive-emotional coping strategies in Slovak elite athletes.

2. Materials and methods

We conducted basic research using a quantitative correlation-comparison design. The study population consisted of 208 Slovak elite athletes – 115 males (55 %) and 93 females (45 %) aged between 18 and 39 years ($AM = 24.5y$; $SD = 4.18$). The method of selection was stratified with the condition of their current active competitive sports activity at national or international level. One of the key inclusion criteria was a minimum of 5 years of sporting experience in addition to a demonstrable peak sporting level. These were athletes in team sports – hockey and football ($N = 36$; 17 %) and individual sports – judo, cycling, triathlon, biathlon, karate, golf, athletics and running ($N = 172$; 83 %). The average duration of their sport activity was 10.37r ($SD=3.22$). Data collection was carried out in cooperation with the Slovak Military Sports Centre Dukla Banská Bystrica. In line with known facts and in the context of our research design, we have formulated the following research hypotheses and one research question:

H1: We assume a significant gender difference in the level of resilience in favor of men.

H2: We assume a significant difference in the level of resilience in favor of athletes engaged in individual sports.

H3: We assume a significant gender difference in the total score of cognitive-emotional coping in favor of women.

RQ: Will cognitive regulation of emotions be a significant predictor of an athlete's overall resilience?

Data were collected using standardized CERQ questionnaires (Garnefski, Kraaij, 2007) and CD-RISC (Connor, Davidson, 2003).

Cognitive emotion regulation in sport has been measured by the Cognitive Emotion Regulation Questionnaire (Garnefski et al., 2001), which is designed to assess individual differences in cognitive emotion regulation in response to stressful or traumatic events in the event of sporting failures in competition. Respondents expressed their agreement with 36 statements using a 5-point Likert scale (1 = strongly disagree – 5= strongly agree). The questionnaire consists of the following strategies- Self-blame; Acceptance; Perseveration of Negative Emotions; Positive Orientation to the Situation; Planning; Positive Restructuring; Confrontation with a Similar Situation; Catastrophizing and Projection. Scores for each strategy ranged from 4-20, the higher the score the higher the preference for that strategy. The internal consistency of each strategy was sufficient ($\alpha=.77$; $-\alpha=.93$).

Resilience was measured by the Connor-Davidson Resilience scale – CD-RISC (Connor, Davidson, 2003), which is aimed at the general adult population. The scale focuses on resilience as the ability to cope with stress in the adult population. The questionnaire contains 25 items with responses on a 5-point Likert scale (0 = not at all valid – 4 = absolutely valid). The higher the score the respondent indicates the higher the level of resilience he/she achieves. Individual items are saturated by operationally defined factors such as: Hardiness (ability to control one's own life); Coping (ability to cope with stress); Flexibility (positive acceptance – adaptation to change); Meaning (ability to see meaning in life); Optimism (optimistic outlook on life); Cognitive-emotional regulation (ability to consciously use specific coping strategies to cope with emotionally challenging situations); and Self-efficacy (beliefs about one's own effectiveness in coping with challenging situations). The internal consistency of each factor was sufficient ($\alpha = .73$; $-\alpha = .91$).

We used univariate and bivariate descriptive statistics to process the research data, followed by inferential statistical procedures. We tested the normality of the distribution of the variables with the Shapiro-Wilkov test and the Kolmogorov-Smirnov normality test in the Lilliefors modification. Since some of the variables studied did not show normal distributions, we proceeded to use nonparametric statistical methods in all analyses. We used Spearman's rank correlation coefficient (rs) to analyze correlations. We used the Mann-Whitney U test to identify the significance of differences. The basic description of the variables is complemented by the verification of the internal consistency of each research instrument, and for each of them we verified the reliability using Cronbach's α coefficient. To verify the predictive influence of cognitive emotion regulation on the resilience of elite athletes, we used regression analysis (multiple linear regression method), where the dependent variable was resilience and the independent variable was cognitive emotion regulation.

We used Spearman's rank correlation coefficient (rs) to analyze the correlations
 To assess the strength of the correlation coefficient, we used Cohen's (1988) distribution:
 rS < .1 trivial correlation
 rS < .3 weak correlation
 rS < .5 moderately strong correlation
 rS > .5 strong correlation

To identify the significance of differences, we used the Mann-Whitney U test, where in addition to statistical significance, we also determined the substantive significance using Cohen's coefficient of substantive significance *d*. In interpreting the value of substantive significance, we relied on the intervals reported by Cohen (1988):

- d > .8 high substantive significance
- d < .5 medium substantive significance
- d < .2 weak substantive significance

3. Results

3.1. Resilience of elite athletes. First, we were interested in the current level of resilience of Slovak elite athletes in terms of gender and type of sport activity (Tables 1-3). From Table 1, it is clear that Slovak elite athletes achieved an average resilience score of AM=70.42. The minimum score was 40 and the maximum score was also the maximum level of CD-RISC gross score – 100.

Table 1. Descriptions of summary resilience scores in terms of observed contextual variables

	Median	Average	SD	Min	Max
Resilience	72	70.42	10.43	40	100
Men	73	72.31	10.8	49	100
Women	70	70.12	11.22	38	96
Football	65	66.84	9.31	40	98
Hockey	78	79.32	7.25	68	81
Cycling	80	80.43	12.82	70	99
Golf	59	59.82	7.41	53	66
Running	73	73.51	9.33	52	98
Biathlon	72	71.88	11.52	47	93
Triathlon	70	70.16	6.35	66	73
Athletics	68	69.12	8.25	57	88
Karate	62	63.54	9.48	42	77
Judo	81	82.32	14.33	54	98

Legend: SD – standard deviation, Min – minimum, Max – maximum

We were then interested in gender differences in Resilience (Table 2), where we found a significant difference in the overall Resilience score ($p = .041$), as well as in the Hardiness ($p = .043$) and Self-efficacy ($p = .044$) factors, always in favor of men. In both cases, differences were found in the weak substantive significance band.

Table 2. Significance of gender differences in individual factors of resilience in elite athletes

	Mann-Whitney U Value	P	Median		d
			Women	Men	
Resilience	2351.00	.041	14	18	.35
Hardiness	2027.00	.043	17	19	.22
Coping	2249.50	.462	13	13	-.17
Flexibility	2101.50	.721	14	15	-.03
Making Sense	2312.00	.621	14	13	.16
Optimism	2406.50	.322	16	16	.10
Cognitive-emotional regulation	2389.50	.481	16	16	.08
Self-efficacy	2284.50	.044	14	16	.21

Legend: p – statistical significance; d – value of substantive significance

Table 3 presents our findings of differences in Resilience and its individual factors according to the individuality of sport activity. We found a significant difference only in the overall level of Resilience in favor of individual athletes ($p = .023$; $Mdn = 78$).

Table 3. Significance of differences in individual factors of resilience in elite athletes in terms of individuality of sport focus

	Mann-Whitney U Value	p	Median		d
			Indiv. Sports	Group Sports	
Resilience	2351.00	.023	78	71	-.34
Hardiness	2287.00	.112	14	15	.12
Coping	2448.50	.412	15	15	-.18
Flexibility	2218.50	.461	16	13	.13
Making Sense	2484.00	.732	15	15	-.10
Optimism	2509.50	.567	15	17	.19
Cognitive-emotional regulation	2378.50	.323	16	15	-.18
Self-efficacy	2249.50	.801	15	14	-.07

Legend: p – statistical significance; d – value of substantive significance

In the case of the analysis of the association between Resilience and length of sport activity, we found a moderate positive association ($r_s = .389$; $p = .032$).

3.2. Cognitive emotion regulation in elite athletes. Similarly to resilience, we analyzed the cognitive regulation of emotions of Slovak elite athletes in terms of gender and type of sport activity (Tables 4–6). In terms of individual sports, we found the highest scores in Cognitive regulation of emotion in athletes ($AM = 131.53$; $Mdn = 133$) and the lowest in karate athletes ($AM = 112.86$; $Mdn = 113$).

Table 4. Descriptions of cognitive emotion regulation summary scores in terms of observed contextual variables

	Median	Average	SD	Min	Max
Cog. emotion	122	123.52	9.54	90	150
Men	122	122.81	1.11	89	152
Women	120	119.23	8.35	99	144
Football	1148	118.32	5.31	106	125
Hockey	122	121.82	3.41	118	125
Cycling	125	126.32	9.48	116	143
Golf	120	121.32	6.65	115	120
Running	123	121.62	10.52	101	151
Biathlon	121	119.38	10.63	97	149
Triathlon	117	115.74	11.24	109	128
Athletics	133	131.53	8.35	120	147
Karate	113	112.86	9.18	95	118
Judo	120	118.93	12.62	108	144

Legend: SD – standard deviation, Min – minimum, Max – maximum

Testing the significance of gender differences in Cognitive emotion regulation strategies revealed that female athletes reported significantly higher levels of preference for Self-blame ($p = .018$; $Mdn = 15$) and Acceptance ($p = .044$; $Mdn = 15$), in both cases the differences were moderately substantive significant (Table 5).

Testing the significance of differences in terms of individuality of sporting activity in the Cognitive emotion regulation strategies is presented in Table 6.

Table 5. Significance of gender differences in individual cognitive emotion regulation strategies in elite athletes

	Mann-Whitney U Value	P	Median		d
			Women	Men	
Cognitive regulation of emotions	1609,00	.382	120	122	-.22
Self-blame	1937,50	.018	15	12	-.54
Acceptance	2030,00	.044	15	14	-.42
Perseveration of negative emotions	1944,00	.257	16	8	-.16
Posit. situation orientation	2194,50	.158	14	15	.17
Planning	2181,00	.741	14	12	.05
Positive restructuring	1967,00	.249	1	16	-.13
Confrontation	2196,50	.227	14	14	.21
Catastrophizing	2247,50	.352	11	12	.14
Projection	2158,00	.248	8	9	.14

Legend: p – statistical significance; d – value of substantive significance

Table 6. Significance of differences in individual cognitive emotion regulation strategies in elite athletes in terms of individuality of sport focus

	Mann-Whitney U Value	P	Median		d
			Indiv. Sports	Group Sports	
Cognitive regulation of emotions	1725.00	.039	119	120	-.45
Self-blame	2015.50	.051	16	14	-.08
Acceptance	2124.00	.214	15	14	-.12
Perseveration of negative emotions	1998.00	.332	15	8	-.14
Posit. situation orientation	2015.50	.541	11	13	.04
Planning	2171.00	.235	16	14	.05
Positive restructuring	1925.00	.041	16	12	-.44
Confrontation	2192.50	.187	15	14	.08
Catastrophizing	2105.00	.487	13	10	.11
Projection	1954.50	.225	9	9	.28

Legend: p – statistical significance; d – value of substantive significance

Our findings show that for the overall measure of Cognitive emotion regulation, group athletes scored significantly higher ($p = .039$; $Mdn = 120$), whereas for the preference for Positive restructuring, individual athletes scored significantly higher ($p = .041$; $Mdn = 16$). The substantive significance of both of these differences was in the medium substantive significance range.

3.3. Cognitive emotion regulation as a predictor of resilience in elite athletes.

We concluded our study by investigating the predictive influence of Cognitive emotion regulation on Resilience in elite athletes (Table 7).

Table 7. Multiple linear regression

	B	β	t	p
Constant			4.328	.000
Cognitive reg. of emotions	.496	.383	7.003	.000
F (9.48) = 52.602***		R ² = .385		Adj. R ² = .323

Legend: B – unstandardized regression coefficient, β – standardized regression coefficient, t – t-test, p – statistical significance, F – F-test; *** $p < .001$

After checking the assumptions (normality of the distribution of residuals, testing for multicollinearity, homoskedasticity, removing outliers, etc.), we opted for the multiple linear regression method.

Analysis of variance shows that the regression result is statistically significant. From the data presented in [Table 7](#), it is clear that the proposed regression model explains 32.3 % of the dependent variable – resilience. Thus, cognitive emotion regulation is a positive predictor of the overall level of resilience of elite athletes.

4. Discussion

The issue of resilience has received considerable attention worldwide. Several studies have reported findings on its current average level in the general population ([Connor, Davidson, 2003](#); [Davidson, Coonor-Davidson, 2021](#); [Johnson, 2021](#), etc.). However, we can also find studies focused on resilience in sports, stating its average level among long-distance runners ([Gonzales et al., 2016](#)), cricket players ([Gucciardi, 2011](#)), and athletes ([Hosseinni, Besharat, 2010](#)). Our research sample was significantly heterogeneous in terms of sports activities, which was also reflected in the different average levels of mental resilience among athletes. The highest level of resilience was reported by judo and cycling representatives, while the lowest level was found among golfers. Based on the average values, we can conclude that top athletes in Slovakia report a total resilience score in the lower range of the general average. However, we have not come across any studies pointing to the effectiveness of programs developing resilience in Slovak athletes, which supports our findings of a lower average level compared to foreign studies.

In terms of gender differences, we expected a higher level of resilience in male athletes in H1. We were able to confirm this assumption, as we found a significant difference not only in the overall level of resilience but also in the factors of hardiness and self-efficacy using the Mann-Whitney test. Despite the heterogeneity of the research sample, our findings clearly correspond with foreign studies ([Cowden et al., 2016](#); [Zurita-Ortega et al., 2017](#); [Kivrak, Akandere, 2019](#); [Kilic, 2020](#); [Blanco-García et al., 2021](#); [Patsiaouras, 2021](#)), not only in terms of gender differences, but also in terms of the relationship between resilience and the length of time spent participating in sports activities, where we found a moderately strong positive correlation. In this case, the directly proportional relationship between the level of resilience and the increase in the number of competitions completed is one of the most important factors increasing the level of mental resilience in athletes ([Kilic, 2020](#)).

In the second research hypothesis, we assumed a significant difference in the level of resilience among athletes in relation to the individuality of sports performance in favor of athletes engaged in individual sports. We were able to confirm this assumption at a 5 % level of statistical significance, which corresponds with some foreign studies ([Tugade, Fredrickson, 2004](#); [Jalili, Hosseinchari, 2011](#)), leading us to conclude that the mechanisms for creating and developing resilience in individual and team athletes are different. According to Fletcher and Sarkar (2016), the development of resilience in individual sports emphasizes primarily the subjective and individual needs of the athlete in the areas of cognitive processes, executive functions, goal-directed attention, and emotion regulation, while in team sports, the emphasis is on team resilience and the interpersonal factor of resilience. Our findings are also at odds with the study by Sheikh (2015) and, to some extent, Reche-García et al. (2020). The study by Reche-García et al. (2020) is particularly inspiring for us, as although the authors did not find a difference in resilience between team and individual sports, they did find a significant difference in the level of resilience in combat sports. Our research shows a similar trend, as judo representatives achieved the highest average level of resilience, while karate practitioners achieved the lowest level. Given the size of both groups, we consider this finding to be inspiring for future empirical analyses.

Similar to resilience, we also analyzed the cognitive regulation of emotions in Slovak top athletes in terms of gender and type of sporting activity. From the perspective of individual sports, we found the highest scores in cognitive regulation of emotions in athletes and the lowest in karate practitioners. Since several studies ([Gould et al., 1993](#), [Nichols et al., 2005](#); [Nichols et al., 2006](#)) point to a certain flexibility in the choice of coping strategies among athletes, we were interested in what strategies male and female athletes would prefer and whether the difference between them would be significant (H3). In the case of the overall score, we were unable to confirm the difference as significant, but our findings show that female athletes reported a significantly higher preference for the Self-blame and Acceptance strategies. Our findings partially correspond with the findings of

(Balzarotti et al., 2016; Costa et al., 2020) and suggest that female athletes are more likely to show signs of internality and attribute the results of their athletic performance to their own efforts, which leads to reconciliation – acceptance of the situation.

In terms of differences in the individuality of sporting activities, team athletes achieved significantly higher scores in cognitive emotion regulation, while individual athletes preferred the Positive Restructuring strategy. In other words, team athletes report a higher degree of cognitive-emotional coping ability, while individual athletes have a more developed ability to see the results of their performance from different perspectives. An analysis of available sources shows that there are differences between individual and team athletes in their perception of stressors and their responses to them. Team athletes perceive stressors as a problem for the whole team, use the synergistic effect of joint solutions, and often choose group coping strategies (Crocker et al., 2015). Stressors in team sports often stem from social pressure (provocations from opponents, behavior of spectators, coaches, etc.), relationships within the team (interpersonal conflicts), poor performance (opponent dominance, inability to score, etc.), or material and organizational conditions (Leprince et al., 2018). Individual athletes, however, perceive and are sensitive to the fact that they are practically alone in coping with stressors. According to Dias et al. (2010), these athletes report higher levels of fear, somatic anxiety, and threat perception and prefer strategies of expressing emotions, which corresponds to the preference for self-blame among individual athletes, the difference which proved to be just above the threshold of statistical significance.

In an effort to gain a more comprehensive view of the determination of resilience from the perspective of cognitive emotion regulation strategies, we were interested in whether cognitive emotion regulation would act as a significant predictor of overall resilience. We found that the proposed regression model explains more than 32 % of the variability of the dependent variable – resilience. This shows that cognitive-emotional coping is a positive predictor of resilience in Slovak athletes, and we therefore consider it beneficial to focus on developing its individual strategies through a development program designed specifically for the needs of individual sports.

The most significant limitation of our research was the heterogeneity of the research sample and the significantly uneven distribution of the sample in terms of individual sports. A certain limitation in the generalization of our findings also results from the specifics of self-reporting tools for collecting research data. Our intention for the future is definitely to increase the size of the research sample and analyze the preferences of individual cognitive emotion regulation strategies from the perspective of individual sports. From the perspective of techniques that have been researched and verified abroad, the Method of Conscious Attention Control (Model of Circles of Attention – Eberspächer, 1990) appears to be effective. The importance of attention is also emphasized by Gregor (2013) and Pavel and Pavlová (2019). The potential for conscious concentration on a goal can be found in the concept of mindfulness, which has its roots in Buddhist philosophy and according to which regular, short exercises influence the increase in resilience and cognitive regulation of emotions, with the subsequent experience of flow (Jackson, Csikszentmihalyi, 1999; Kabat-Zinn, 2003; Zeidan et al., 2010; Gardner, Moore, 2012; Sant, 2015). Therefore, another of our goals is to design an intervention program for the development of individual factors of resilience and the training of effective emotion regulation strategies in Slovak athletes and to experimentally verify its effectiveness.

5. Conclusion

Every sport is specific and unique in some way, but it always places high demands on the athlete's self-regulatory and adaptive mechanisms. Coping with mental stress in the environment of top-level sport is largely dependent on the level of resilience and the ability to effectively use coping strategies. It is especially true that top athletes face higher performance demands compounded by higher expectations, and these individuals are able to adequately regulate and manage this pressure thanks to training and previous repetitive experiences. Many athletes are aware of this fact and work specifically on their mental resilience.

Numerous studies confirm that athletes with an adequate level of resilience are characterized by greater self-confidence, higher concentration, and the ability to better control the situation during races and competitions, as well as higher performance motivation. They achieve more stable peak performances, better control their thoughts and individual steps during performance, and are better at planning short-term and long-term goals. They believe in themselves more and do not allow themselves to be influenced by negative external factors. They know how to use competitive

pressure to their advantage, cope better with anxiety, fears, and are able to deal with disruptive changes in their environment more easily.

Our research aimed to contribute to raising awareness of mental toughness among top athletes in Slovakia, which can be specifically improved through mental training, which is often not given adequate attention alongside the physical component (Kováčová, Broďáni, 2008; Chochlíková, 2018, etc.). We therefore consider our research findings to be an exploration of the issue under investigation, with the potential to inspire further studies, whether comparing athletic and non-athletic population, revealing further specifics of stress management in athletes, or verifying the effectiveness of intervention programs that develop resilience – its individual factors, but also emotional regulation, which appears to be an important determinant not only of athletic performance, but also of the athlete's quality of life. The results of our study also provide a basis for the implementation of either longitudinal monitoring of the development of resilience, or experimental verification of the effectiveness of psychological interventions focused on self-regulation techniques, whereby we consider the Method of Conscious Attention Control or mindfulness approaches, which can positively influence the level of resilience and cognitive regulation of emotions in athletes, to be promising.

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