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EFFECTIVENESS OF ATHLETES' PRE-COMPETITION MENTAL PREPARATION

UČINKOVITOST PSIHIČNE PRIPRAVE NA ŠPORTNIKOVA PREDTEKMOVALNA STANJA

ABSTRACT

Precompetitive states are athletes' psychological states experienced in the last days before a competition. Precompetitive states are extremely important for athletes as they have an important influence on competitive performance. Three major psychological phenomena are related to precompetitive states, i.e. anxiety, concentration and self-confidence. Different forms of mental training and various psychological techniques can be used to develop and strengthen positive such states. Our study was conducted on members of the Slovenian national league basketball team (N=11) who participated in our mental preparation programme with the aim of achieving more positive precompetitive states. Prior to and following completion of the mental training, team members completed the following questionnaires: CSAI (Competitive State Anxiety Inventory-2), SAS (Sport Anxiety Scale), STAI (Sport Anxiety Scale) and the TP Attention Test. The mental preparation programme lasted 12 weeks and consisted of relaxation techniques, positive self-talk, hypnotic suggestions, concentration techniques and visualisation techniques. Analysis of the data obtained prior to and after completion of the mental preparation programme showed an improvement in the ability to concentrate and a reduction of precompetitive state anxiety. Further, a slight tendency towards an improvement in self-confidence was noticed. The measured trait anxiety levels were also reduced. In general, the mental preparation programme incorporating various psychological techniques proved to be efficient.

Key words: anxiety, concentration, self-confidence, precompetitive states

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POVZETEK

Predtekmovalna stanja so psihična stanja športnika od nekaj dni do začetka tekme. Predtekmovalna stanja so za športnike zelo pomembna, saj imajo le-ta pomembno vlogo pri kvaliteti nastopa na tekmi. Za predtekmovalna stanja so pomembni predvsem trije veliki psihološki fenomeni: anksioznost, koncentracija in samozavest. Za razvijanje in krepitev predtekmovalnih stanj lahko uporabljamo različne mentalne treninge in psihološke tehnike. V raziskavo smo vključili košarkarsko ekipo (N=11), s katero smo izvajali program psihične priprave, z namenom izboljšanja predtekmovalnih stanj. Ekipo smo testirali pred začetkom in po koncu psihične priprave, z vprašalniki CSAI (Competitive State Anxiety Inventory-2), SAS (Sport anxiety scale), STAI (Sport anxiety scale) ter testom pozornosti (Test of attention). Program psihične priprave je trajal dvanajst tednov in je zajemal tehnike sproščanja, pozitivnega samogovora, hipnotičnih sugestij, tehnik koncentracije in vizualizacije. Rezultati analize podatkov pred in po koncu psihične priprave so pokazali, da je bil napredek viden pri sposobnosti koncentracije in v znižanju somatske predtekmovalne anksioznosti. Nakazana je tudi tendenca po krepitvi samozaupanja. Znižala se je tudi anksioznost, kot poteza. V splošnem se je program psihične priprave z uporabo različnih psiholoških tehnik pokazal kot uporaben.

Ključne besede: anksioznost, koncentracija, samozaupanje, predtekmovalna stanja

INTRODUCTION

Precompetitive states in sports can be defined as psychological and physical states experienced by an athlete in the last few days before a competition up until the moment just before they start to perform a certain competitive activity. Precompetitive states have an important influence on the quality of an athlete's performance. That is why it is crucial for athletes to be able to control such states. When analysing precompetitive behaviour, one should pay attention to the level of somatic activation, the level of self-confidence and the ability to sustain and direct one's thoughts (concentration). In striving for optimal competitive behaviour, the amount of stress needs to be taken into account as well as athletes' ability to cope with stress and control their precompetitive anxiety (Tušak, 1995).

There are two levels of precompetitive anxiety: cognitive (thought-related) and somatic (physical) (Cox, 1994). Somatic precompetitive anxiety typically expresses itself as an over-activation of the autonomous nervous system (Balague, 2005). On the physical level, the over-activation is evident from rapid changes in the body such as a quicker heart rate, sweaty palms, a dry mouth, fast and shallow breathing, shaking muscles etc. In contrast, precompetitive anxiety occurs on the psychological level. In stressful situations the psychological functioning of an athlete also changes. Typical changes include nervousness, agitation and irritability, a reduced ability to concentrate, uncontrolled haste, excessive talk, decision-making problems etc. It can roughly be said that the cognitive aspects of anxiety manifest in unfavourable thoughts and feelings (Weinberg & Gould, 2003). The aforementioned symptoms on both physical and psychological levels are detrimental to optimal functioning while changes in the psychological state destabilise an athlete's behaviour (Harutyunyan, 2004). Unfavourable physical and psychological states exert a negative influence on competitive functioning.

Experts researching the cognitive and somatic aspects of anxiety (Cox, 1994; Masten, Tušak, & Kandare, 2006; Parfitt & Hardy, 1987; Ussher & Hardy, 1986) agree that the cognitive aspect influence competitive success far more than the somatic aspect. The somatic aspect of anxiety is a normal and healthy response to stressful situations and the way an individual is able to cope with a situation often provides an indicator of an individual's readiness for competition (Tušak & Tušak, 2003). On the psychological level, an optimal level of activation will lead to positive emotions, self-confidence, optimism, an optimal level of attention, the feeling of being able to control the situation as well as optimal muscular movement and performance. When the level of activation is optimal, athletes are able to closely monitor stimuli in a competitive situation and gain optimal control over their own movement.

High self-confidence is typically accompanied with a high expectation of success. Self-confidence helps improve concentration, boosts pleasant emotions as well as heightens satisfaction and efforts made to achieve a goal. The correlation between self-confidence and competitive performance is one of the most important aspects of competitive performance for athletes. Many studies confirm the positive effect of self-confidence on competitive success (Feltz, 1984; Frost & Henderson, 1991; Koivula, Hassmen, & Fallby, 2001; Vealey & Greenleaf, 2001; Weinberg & Gould, 2003), although the factors of success mediating the self-confidence–performance relationship are less well-known. Self-confidence generally depends on various factors such as an athlete's personality, demographic factors (gender, age), general level of precompetitive anxiety (Koivula et al., 2001), and their cognition and valence of attributions (Weinberg & Gould, 2003). Self-confident athletes believe in themselves and their ability to acquire the skills, abilities and competencies they need

to achieve their potential on both physical and psychological levels (Weinberg & Gould, 2003). By contrast, less self-confident competitors doubt their abilities or believe they are not good enough to be successful. Self-confidence is reported by most athletes as being an inherent part of their best performances or competitive success (Gould, Hodge, Peterson, & Gianni, 1989; Hardy, Hall, & Hardy, 1996).

The relationship of precompetitive anxiety and performance in sports is one of the most well-researched fields of sports psychology (Hanton, Mellalieu, & Hall, 2004; Woodman & Hardy, 2003). Self-confidence is reported to increase the tolerated level of cognitive precompetitive anxiety and arousal and minimise the negative influence of the latter on athletes' performance (Hanton et al., 2004). Many studies confirm the role of self-confidence as an important variable influencing the way an athlete experiences precompetitive anxiety (Hanton et al., 2004; Jones & Swain, 1995). Athletes who do not view symptoms of precompetitive anxiety as something threatening have greater self-confidence than athletes influenced by precompetitive anxiety in a negative way and experience it as exhausting (Jones & Swain, 1995). It can thus be summed up that high self-confidence protects an athlete from an excessively negative response to precompetitive anxiety and heightens their ability to control their emotions and handle the pressure prior to competition.

Another key element in sports is an athlete's ability to concentrate. Cox (2002) and various other researchers write that hardly any other areas of sports psychology have such a great impact on general performance as concentration. The higher the level of concentration an athlete can achieve, the better their sports performance. Athletes who are mentally well prepared are able to effectively alternate between a state of being in focus and a more relaxed state. At competitions, athletes should not be too tense and should instead be in a state of relaxation so they can actively control their concentration (Tušak & Tušak, 2003). Concentrating and retaining focus makes it possible to react instantaneously with optimal power and optimises those parts of task performance that cannot be controlled directly (Syer & Connolly, 1998). An important part of concentration in the sports context is selective attention. For athletes to focus on their performance, they should be able to ignore any irrelevant stimuli and focus on the important stimuli. Concentration is a tool that enables athletes to sustain an appropriate level of excitement that in turn allows a sustained focus on a stimulus over a longer period of time. Successful concentration means that an athlete's attention is focused on the right stimulus at the right time. Concentration usually drops when one's focus becomes divided or directed at a stimulus that is irrelevant to the task at hand (Cox, 2002). Perfect concentration is achieved when an athlete focuses on a single thing and has no other thoughts. An individual's attention or concentration can also be improved through certain exercises and mental preparation.

The diagram below presents the circular model designed by Hanton and colleagues (2004) and is based on results of their study. The diagram presents the relationship between self-confidence and the perceived level of precompetitive anxiety as well as some other negative factors that occur as a response to low self-confidence. The model is based on data obtained from interviewing top athletes and athletes' introspective reports about their performance or participation at competitions. As the model shows, athletes with low self-confidence doubt they will perform as well as they can and question their performance. Low self-confidence further correlates with athletes' worries about their ability to concentrate, leads to negative feelings regarding the competition and their performance and evokes negative images about the latter. On top of everything, it can thus also evoke negative images and memories of previous poor performances and mistakes

made. This can trigger negative thoughts regarding the competition, a reduced ability to focus and concentrate, an absence of positive emotions, and a higher level of anxiety. Athletes report they find it difficult or even impossible to stop the flow of negative thoughts and negative images with regard to their performance. In fact, they find such symptoms to be beyond their control. Athletes interpret these symptoms as being destructive for their performance, creating a feedback loop leading to lower self-confidence and potentially a poorer performance.

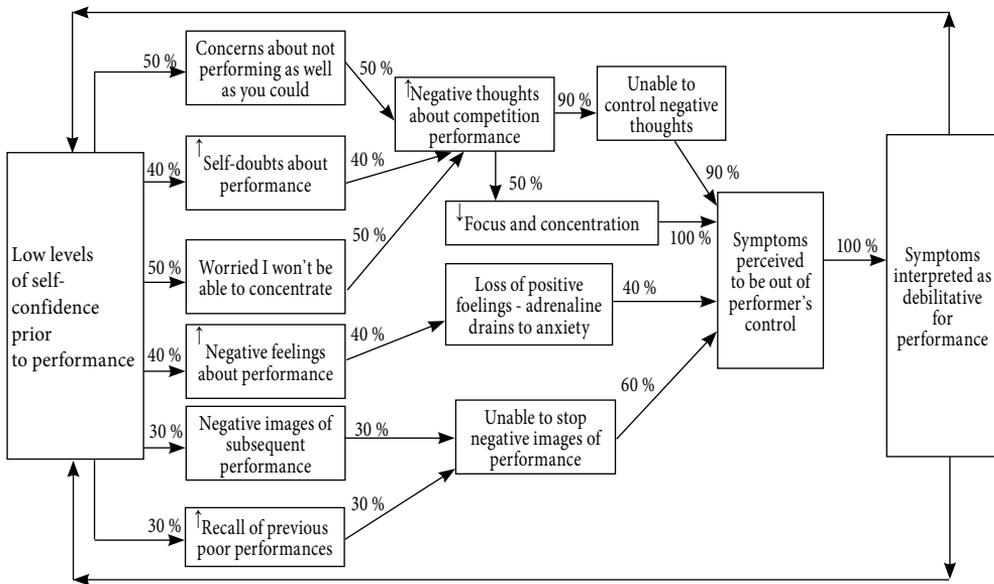


Figure 1. A schematic representation of the influence of self-confidence on other psychological factors and precompetitive states (Hanton et al., 2004)

As evident from the above scheme, often the root of the problem is not so clear in sports situations. That is why our mental preparation training also sought to teach athletes how to employ various techniques to influence three major precompetitive states, i.e. anxiety, self-confidence and concentration. Research indicates that a single technique can be used to improve several abilities and, vice versa, a single ability can be improved through various techniques or methods (Valley & Greenleaf, 2001).

When athletes learn to use appropriate mental techniques of relaxation and/or activation, cognitive techniques and visualisation, they can use the latter to successfully control the level of activation of the system, their thoughts, self-confidence and concentration. Psychologists use many relaxation techniques, ranging from hypnosis to autogenic training, breathing exercises, progressive muscular relaxation and biofeedback. In our research we instructed the athletes in deep relaxation and breathing exercises that can be used directly before training. Besides using relaxation to reduce the precompetitive symptoms of somatic anxiety, we also used visualisation and positive hypnotic suggestions to limit the stress present before a demanding event (a competition). Positive suggestions are especially useful for reducing athletes' precompetitive cognitive aspects of anxiety and boosting their self-confidence and self-trust. Positive visualisa-

tions allow athletes to imagine themselves performing well and this thereby strengthens their belief in themselves.

Mental preparation aims to develop, train and optimise those psychological traits that contribute to an athlete's success or better functioning as well as techniques that improve an athlete's control of relevant traits (Orlick, 1986). These traits need to be recognised, used and activated by athletes in specific circumstances (e.g. in a match or competition) in order to achieve optimal functioning.

Athletes' mental preparation prior to high-level competitions was also researched by Blumenstein and Lidor (2007). These researchers presented a psychological programme for the mental preparation of top athletes participating at the 2008 Beijing Summer Olympic Games – the programme was devised for a four-year period by Blumenstein and Lidor in cooperation with various psychologists and organisations in Israel. The programme comprised the techniques of visualisation, directing attention, relaxation and positive self-talk, all of which are commonly applied in psychological practice to help an athlete overcome various psychological barriers. Such barriers include a low level of motivation, a lack of concentration, mental exhaustion and a fear of injury, anxiety and doubting one's own abilities. The results of the specific psychological training were favourable. The preparations led to a real improvement in the psychological traits of athletes who participated in the programme as well as their psychological hardiness (Blumenstein & Lidor, 2007).

Our mental preparation programme consisted of general mental preparation with an emphasis on teaching athletes specific psychological techniques. The programme was designed to be applied in both group and individualised meetings with athletes. We instructed the athletes with regard to relaxation exercises, visualisation, positive self-talk, activation, breathing techniques, eliminating negative thoughts as well as exercises for improving and sustaining concentration. The preparation programme also included individual interviews so that with its selection of techniques the programme could be tailored to meet the needs of individual athletes. Between the group sessions, the athletes thus also performed exercises that formed part of their individualised programme.

METHODS

PARTICIPANTS

Our study was conducted on 11 basketball players, aged 17 to 27, who were members of the basketball team in the 2010/2011 season and played in the national championship.

Table 1: Experimental group descriptives

Descriptives	
No. of participants (N)	11
N at the beginning of the prep.	14
Age	17–27 years
Average age	21.2 years
Placing of the team	4th place

The decrease in the number of participants has to be mentioned. During the time of the mental preparation, two athletes sustained an injury and underwent a rehabilitation process and therefore missed a major part of the mental preparation programme. We thus decided to leave them out of the final data analysis since they only participated in some of the psychological sessions. One of the basketball players left the team to join another club in the middle of the season and we were thus also forced to leave him out of the study.

INSTRUMENTS

State-Trait Anxiety Inventory – STAI (Spielberger, Gorsuch, & Lushene, 1970). The STAI X-1 (state) inventory was used to evaluate athletes' tendency to experience precompetitive anxiety as a state, while STAI X-2 (trait) was employed to measure anxiety as a personality trait.

The STAI questionnaire consists of two scales, each comprising 20 items: (1) Anxiety as a state (STAI X-1) is the emotional state of the individual characterised by fear, worries and tension. (2) Anxiety as a trait (STAI X-2), on the other hand, assesses anxiety as an individual's tendency to perceive certain situations as threatening and to respond to such situations with anxiety. For each item on the two scales, participants indicate the frequency of using the strategy described by each item, responding on a 4-point Likert scale: "almost never", "sometimes", "often", "almost never". The results range from 20 to 80 points. The higher the score, the more expressed the anxiety (Spielberg et al., 1970).

The test-retest method correlations yielded a reliability coefficient of 0.54 for STAI X-1 (state) and 0.86 for STAI X-2 (trait) (Spielberg et al., 1970). The internal consistency of the questionnaire is around 0.90. The questionnaire's validity was tested by correlating results in other tests assessing anxiety as a trait. STAI X-2 (trait) correlates highly (a positive correlation) with the Manifest Anxiety Scale-MAS – the correlation coefficient was found to be around 0.73. The correlation of the results for STAI X-2 and for the Anxiety Scale Questionnaire – ASQ is similarly high (0.85). STAI X-1 (state) was also found to correlate positively with other questionnaires that measure anxiety as a state. It correlates with the Anxiety Sensitivity Index – ASI and the Conjugate Lateral Eye Movement test – CLEM (Ostrow, 1990).

Sport Anxiety Scale – SAS (Smith, Smoll, & Schutz, 1990)

The inventory assesses precompetitive cognitive state anxiety and precompetitive somatic anxiety. It contains 21 items which are divided into three scales: Somatic Anxiety (9 items), Worry (7 items) and Concentration Disruption (5 items). Cronbach alpha reliability coefficients for the scales are as follows: 0.88 for Somatic Anxiety, 0.82 for Worry and 0.74 for Concentration Disruption. The retest reliability coefficient for a seven-day interval was 0.85 for all three of the scales (Smith et al., 1990). Convergent validity was confirmed through the correlation with the Sport Competition Anxiety Test – SCAT, where the results obtained on a sample of 837 high school athletes. To a smaller extent, the validity of the test was also confirmed by a correlation with Spielberg's STAI (Smith et al., 1990). Footballers' scores for the SAS questionnaire successfully predicted their future results. After two weeks, the footballers completed the Profile of Mood States questionnaire. SAS was found to have good predictive validity – it predicted the rate of precompetitive tension and confusion (Ostrow, 1990).

Competitive State Anxiety Inventory-2 – CSAI-2 (Martens, Burton, Vealy, Bump & Smith, 1990)

The questionnaire is intended for the measurement of three relatively independent competitive states: cognitive state anxiety, somatic state anxiety and competitive state self-confidence. The questionnaire consists of 27 self-report items. There are three scales and each scale comprises 9 items with answers on a 4-point Likert scale. Although the questionnaire was originally designed for research purposes, it can also be used in clinical practice. Internal consistency coefficients (Cronbach α) are reported to range from 0.79 to 0.83 for the scale of cognitive state anxiety, from 0.82 to 0.83 for somatic state anxiety and from 0.87 to 0.90 for self-confidence as a state. The three CSAI-2 scales proved to be reliable, with their reliability proven through correlation of the scales with results for the Sport Competition Anxiety Test, results for the Gender State and Trait Anxiety Scale, Rotter's Internal-External Locus of Control Scale, as well as Zuckerman's Affect Adjective Checklist and Achievement Anxiety Test (Martens et al., 1990).

Freiburg Personality Inventory – FPI – Sincerity Scale (Fahrenberg, Selg, & Hampel, 1978; Bele-Potočnik, Hruševar, & Tušak, 1984)

The scale of sincerity was used to assess the tendency to provide socially desirable answers. FPI is a multidimensional personality questionnaire and the scale of sincerity is one of its 12 scales. The sincerity scale is used to measure honesty and admitting to minor weaknesses and mistakes, self-criticism and the tendency to provide socially desirable answers (Bele-Potočnik et al., 1984). Participants provide yes or no answers and respond to 14 items on the scale. Cronbach's alpha coefficient for the scale is $r = 0.75$.

Test of Attention (TP) (Djurić, Bele-Potočnik, & Hruševar, 1985)

The test was used to measure focused visual attention. The test consists of 40 rows, with each containing 40 squares with a side length of 2 mm and lines drawn in different directions. The participant's task is to find the number of a certain type of square in each row. Participants were required to find the number of different types of squares in each row and to do this as accurately as possible (the types of squares were agreed upon in advance). A high number of correct answers means that an athlete's perception is focused, persistent and reliable. Authors of the test report a reliability coefficient of $r = 0.44$ ($N = 62$) obtained by the test-retest method (Djurić et al., 1985).

PROCEDURE

The effectiveness of the mental preparation programme was tested in a real situation – the participants completed psychological questionnaires before and after the mental preparation. Data were analysed using the SPSS statistical programme. Since the distribution of the data was found to be normal, the statistical significance of differences in results prior to and following the mental preparation was tested with a t-test for dependant samples and an effect-size measure (Cohen's d).

MENTAL PREPARATION PROGRAMME

Our mental preparation programme was designed with the aim of improving athletes' precompetitive states, i.e. anxiety, concentration and self-confidence. The programme included various techniques for improving precompetitive states. Relaxation techniques comprised autogenic training, deep relaxation and breathing techniques. Hypnotic and posthypnotic suggestions were also used to enhance self-confidence and trust in one's abilities. We further applied different

techniques for eliminating negative feelings, fear and other common negative precompetitive states in a state of hypnosis or deep relaxation.

The preparation programme consisted of 12 sessions; in both the first and final sessions the athletes completed the questionnaires. Sessions were performed once a week, either individually or in a group. In the intervals between the sessions, the athletes performed exercises that were part of each athlete's individualised mental preparation programme.

Session 1: Psychological testing and psychodiagnosis

Session 2: Stress test

Session 3: Deep relaxation technique

Session 4: Deep relaxation technique and breathing exercises

Session 5: Deep relaxation technique and an exercise for clearing negative thoughts

Session 6: Deep relaxation and visualisation

Session 7: Breathing exercises

Session 8: Breathing exercises and concentration techniques

Session 9: Deep relaxation technique and the use of positive suggestions

Session 10: Deep relaxation technique and an exercise in the visualisation of the state prior to the performance

Session 11: Visualisation technique and using positive suggestions

Session 12: Psychological testing

RESULTS

Table 2: Descriptive statistics for all of the assessed dimensions of precompetitive states and differences in the results prior to and following the mental preparation programme (initial and final testing). The table also includes effect-size coefficients (Cohen's *d*).

		MEASURED		t-test	DIFFERENCES		
		before	after		df	p	d
Cognitive precompetitive anxiety	M	16.00	15.09	0.66	10	0.52	0.15
	SD	6.43	5.84				
Worry	M	11.82	11.27	0.71	10	0.49	0.11
	SD	4.98	4.27				
Somatic precompetitive anxiety	M	16.36	14.73	1.78	10	0.10 ^t	0.39
	SD	4.06	4.27				
Anxiety as a state	M	33.18	31.73	1.35	10	0.20	0.20
	SD	7.33	6.96				
Anxiety as a trait	M	37.45	33.09	2.51	10	0.03*	0.55
	SD	7.90	7.85				
Self-confidence	M	28.55	30.18	-1.49	10	0.17	0.36
	SD	3.91	4.96				
Concentration disturbances	M	7.36	7.64	-0.71	10	0.50	-0.10
	SD	2.62	2.91				
Attention – correct answers	M	25.45	31.72	-6.51	10	0.00*	1.93
	SD	2.16	3.72				
Sincerity scale	M	8.64	9.00	-0.44	10	0.67	0.20
	SD	2.38	3.10				

*statistical significance $p < 0.05$ (two-way testing)

^ttendency towards statistical significance $p < 0.05$ (two-way testing)

Cognitive precompetitive anxiety

The average cognitive aspects of anxiety score was higher prior to the preparation ($M = 16.00$) than after the preparation had been completed ($M = 15.09$). A lower mean score indicates a lower level of cognitive aspects of anxiety. Despite the difference shown by the average result, the difference is not statistically significant ($t = 0.66, p = 0.52$). Moreover, the effect-size measure suggests there is little difference between the distribution of results of the initial and final testing ($d = 0.15$). It can thus be concluded that the cognitive aspects of anxiety were not significantly lower after the mental preparation. However, a decreasing trend in the cognitive aspects of anxiety is most certainly evident as the competitive situation the team experienced after the final testing should also be taken into consideration. Before the final testing, the athletes had played in the championship finals where the matches are more important. According to theory, precompetitive anxiety also increases along with the growing importance of competitions (Cox, 2002). These results imply that the field should prove interesting for further research.

Worry

The level of worry was similarly low before ($M = 11.82$) and after the mental preparation ($M = 11.27$). After the study was completed, no statistically significant differences were found ($t = 0.71, p = 0.49$). The average level of worry in the team was very low and, according to the norms (Tušak & Tušak, 2003), close to optimal. The mental preparation programme did not decrease worry before the match; since worry was already low in the second measurement, it was difficult to reduce it even more. Further studies could perhaps examine a decrease in worry among athletes with considerably higher levels of worry.

Somatic anxiety

The results of the precompetitive somatic aspects of anxiety reveal that the somatic aspects of anxiety decreased considerably in the second measurement. Prior to the mental preparation, the average score for the dimension of the somatic aspects of anxiety was relatively high ($M = 16.36$), but it decreased after the preparation ($M = 14.37$). While the difference between the initial and final levels of the somatic aspects of anxiety is not statistically significant ($t = 1.78, p = 0.10$), it is just below the level of statistical significance. Further, the effect-size measure ($d = 0.39$) implies medium-high differences between the distributions of the results of the initial and final testing. It can be concluded that the results strongly suggest that mental preparation has a positive impact on lowering the precompetitive somatic aspects of anxiety.

Anxiety as a state

The average scores for precompetitive anxiety decreased during the mental preparation ($M_{\text{initial}} = 33.18; M_{\text{final}} = 31.73$). As the difference is not statistically significant ($t = 1.35, p = 0.20$), it cannot be said that mental preparation lowered the precompetitive anxiety. We are unable to know for certain whether the differences occurred due to the low number of participants or whether they were merely coincidental. Anxiety as a precompetitive state was still similar after the mental preparation programme had been completed.

Anxiety as a trait

The questionnaire on anxiety as a trait yielded interesting results, although it had been presupposed that it would not be significantly different as it represents an aspect of personality traits. Yet analysis of the results revealed that the level of anxiety as a trait was significantly lower ($t = 2.51, p = 0.03$). Prior to the mental preparation, anxiety as a trait was medium-high ($M = 37.45$), but it decreased considerably in the final testing ($M = 33.09$). The effect-size measure ($d = 0.55$) also showed a great difference between the distributions of the results of the initial and final testing.

Self-confidence

The average result on the self-confidence scale increased in the final testing ($M_{initial} = 28.55; M_{final} = 30.18$), although the difference was not statistically significant ($t = -1.49, p = 0.17$). Similarly as above, we should note that this might be due to the small size of our sample as statistical parameters are not very precise when it comes to small samples. The effect-size measure indicates a medium difference ($d = 0.36$) between the distributions of the results of the initial and final testing. It would thus be incorrect to conclude that mental preparation had no impact on improving self-confidence. Nevertheless, we cannot conclude with certainty that improved self-confidence was a consequence of the mental preparation programme. Further research work in this field is thus recommended.

Concentration disturbances

Differences in precompetitive concentration disturbances did not prove to be statistically significant ($p = -0.71, t = 0.50$). There were practically no differences in the second measurement. The average initial score ($M = 7.36$) is very close to the minimum in itself as a result of 5.0 would signify the complete absence of precompetitive disturbances in concentration. Like in the initial testing, the average result in the final testing ($M = 7.64$) revealed no disturbances in concentration. Future research could perhaps examine the potential of the programme to decrease worrying among athletes who experience a considerably higher worry level in a similar context.

Attention

The results of the TP attention test showed that the participants achieved a higher average score after the final testing ($M_{initial} = 25.45; M_{final} = 31.72$). Testing sustained focused attention provided evident results about improved attention in the second measurement. The results suggest that attention increased significantly after the mental preparation had been completed ($p = -6.51, t = 0.00$). It can thus be concluded that the mental preparation programme improved the ability to sustain attention (concentration).

Sincerity

The FPI Sincerity Scale was applied to check whether during the second testing there would be a rise in the participants' tendency to provide socially desirable answers which could jeopardise the validity of the results. As can be seen from our results, there were no statistically significant differences in the tendency to answer in a socially desirable way ($t = -0.44, p = 0.67$) prior to ($M = 8.64$) and following ($M = 9.00$) the mental preparation programme. Athletes responded

with the same amount of critical judgement during the first and second testing and their social desirability scores were not too high.

DISCUSSION AND CONCLUSIONS

The aim of the present study was to provide an answer to the questions frequently posed by athletes, coaches and other sport participants about whether mental preparation actually helps athletes' progress. The answer they receive is usually positive and unambiguous. A number of athletes have stated publicly that they would never have achieved top results without thorough mental preparation. At the same time, various studies have shown the positive effects of certain techniques on various psychological traits. We were thus interested in the extent to which the athletes felt they have greater control over their precompetitive states after participating in the mental preparation programme and whether their precompetitive states have in fact improved.

Since we strove to gain an insight into the way precompetitive states would change, we decided to use the scale of sincerity to check whether the participants had been honest and critical enough when providing their answers. The sincerity scale indicates the participants' tendency to answer in a socially desirable way. We were interested in whether there would be any changes on this scale. Yet the results revealed no significant differences in sincerity between the initial and final testing. The athletes' sincerity remained unchanged and we can thus rule out the possibility of differences in the results occurring as the result of a less critical judgement or a rise in the tendency to provide socially desirable answers.

Harutyunyan (2004) states that precompetitive stress occurs in the majority of athletes regardless of their age, gender or sports discipline. All of the athletes who participated in our study in fact reported that they experience precompetitive anxiety. The response to precompetitive anxiety usually results in a sharpening of the senses, activation of the cardiovascular system, a higher pulse, a drop in peripheral body temperature, vasoconstriction, muscular tremors etc. (Balague, 2005). Therefore, the finding that our mental preparation programme successfully reduced the athletes' level of the somatic aspects of anxiety is even more important. In the future, the athletes who participated in the programme will be able to control their negative somatic states that arise as a consequence of stress and anxiety. The observed lowering of the levels of anxiety, tension and nervousness prior to the competition can be ascribed to the effectiveness of our mental preparation, the relaxation techniques and strategies of coping with stressful situations before a competition that were learned. The decrease in the somatic aspects of anxiety means the athletes are more relaxed prior to competitions, they experience less tension and anxiety, thus making their body more relaxed, their breathing is calmer and more even and the pulse is only slightly increased (Cox, 1994). In general, after participating in our programme the athletes were able to control their somatic states better and learned how to relax and calm down in specific circumstances by resorting to the various relaxation techniques and breathing exercises.

Analysis of the data obtained via Spielberg's questionnaire measuring both anxiety as a trait and anxiety as a state shows that anxiety as a precompetitive state did not significantly decrease in our study; however, there was a significant decrease in anxiety as a trait. On average, the athletes reported a lower level of precompetitive anxiety after the preparation; nonetheless, the difference in the results could also be a coincidence and we are therefore unable to claim that it was directly caused by the mental preparation. As mentioned before, anxiety as a trait assesses anxiety

as a tendency to perceive certain situations as threatening and to respond to such situations with anxiety (Spielberg et al., 1970). After participating in the mental preparation programme, the athletes thus perceived themselves as being generally less anxious, more relaxed and less threatened by various situations. The results are particularly interesting since anxiety as a trait is a personality trait and is thus by definition supposed to be relatively stable and resistant to change (Musek, 2005). Perhaps this is a reflection of the high quality of the mental preparation programme since the athletes perceived themselves as being less anxious in general; conceivably, they could also gradually achieve deeper relaxation prior to competitions and influence their precompetitive states.

There were no significant changes in the level of the cognitive aspects of anxiety before and after the mental preparation programme. After participating in the mental preparation, there was a slight decrease in the athletes' cognitive aspects of anxiety, although it was below the statistical level of significance. At first glance, one could thus hastily conclude that the mental preparation had no significant effect on the level of the cognitive aspects of anxiety. It is however important to consider the context of the second testing after the mental preparation had been completed. At the time of the second testing, the team had played in the national championship finals where every defeat means the team moves further away from its goal. At the time of the second measurement, the players had thus participated in matches that were objectively more important. Expectations were running higher, they were closer to their goal and consequently had a stronger desire to succeed, experienced greater pressure and were more aware of what they would lose if they failed. That is why our result can in fact be seen as encouraging since the athletes could have been objectively expected to report higher cognitive precompetitive anxiety in the days before those final, most important matches. We should therefore draw attention to the fact that the level of precompetitive anxiety did not rise even though the athletes had been engaging in objectively more important matches. As various sport psychology researchers report, the precompetitive cognitive aspects of anxiety also depend on both the objective as well as the subjective importance of a match (Cox, 1994).

The participants in our study did not report having any problems with digressing thoughts or attention before matches. Thus, they also reported no such problems after they had completed the mental preparation. Therefore, it was hard to ascertain the effect of the mental preparation on disturbances to concentration before a match; disturbances were hardly present and it would thus most likely be hard to improve the concentration even further. The effects of mental preparation, i.e. instructing athletes in techniques to sustain attention and lower distractibility before a match, should be further examined on a population of athletes experiencing concentration problems. The results led us to a similar conclusion regarding the level of worry before a match since the results on the scale of worry were similarly already low before the beginning of our mental preparation programme. Accordingly, there were no significant differences in the level of worry and concentration disturbances prior to the match as the scores on two variables remained minimal.

With regard to concentration, the results after the mental preparation and instructing athletes in concentration techniques were favourable. Following the preparation, the participants' ability to sustain highly focused concentration was statistically higher than before the beginning of the preparation. The results also revealed an improvement in the athletes' narrowly focused attention and accuracy of their perceptions (correct answers). For athletes to achieve the required level of concentration, they need to be able to ignore insignificant stimuli and focus solely on relevant

stimuli in a given situation (Syer & Connolly, 1998). The observed improvement in concentration can be ascribed to the effectiveness of the programme since concentration was not only influenced by the techniques for sustaining attention, but also by the relaxation techniques. Relaxation techniques are effective on both the level of releasing tension in the body as well as improving attention and concentration and making it easier for an athlete to concentrate (Vealey & Greenleaf, 2001). During the application of relaxation techniques, athletes also relax mentally and hence face less internal distractors and their negative influence on the athlete's attention. The results regarding concentration unambiguously confirmed the effectiveness of the entire mental preparation programme in our research. The athletes will thus most likely be able to transfer the techniques they acquired for directing attention and sustaining concentration into future competitive situations.

Following the application of our mental training, there was an increase in the athletes' self-confidence, although the difference was below the level of statistical significance. It should be noted that although self-confidence is a relatively stable trait, it also depends to a smaller extent on the situation. If an athlete loses several matches consecutively, this will generally lead to lower self-confidence, while performing well and winning a few consecutive matches usually leads to an increase in self-confidence (Martens, 1987). Our mental preparation triggered an increase in the athletes' self-confidence, i.e. higher scores on self-report questionnaires after participating in the programme. We can thus conclude that the mental preparation influenced the athletes' perception of their self-confidence. Another observation supporting the finding that the mental preparation contributed to increased self-confidence is that the athletes were competing against objectively better opponents at the time of the second measurement. Consequently, they also experienced more defeats than at the beginning of the season when they had competed against all teams. In other words, at the beginning of the preparation the athletes were still playing against less powerful or equally powerful opponents (according to their positions in the league); however, when they had completed the mental preparation programme they were already in the national championship finals and had played against better or equally strong opponents. In the championship finals, they thus had a higher probability of losing to their opponents and slimmer chances of playing so-called confidence-boosting matches against weaker opponents. As can also be seen from the effect-size coefficient, we were indeed able to achieve a positive change in the level of the athletes' self-confidence.

It can therefore be concluded that the mental preparation programme resulted in a lowering of the precompetitive somatic aspects of anxiety and an improvement in the athletes' general concentration ability. The Results also revealed a positive tendency regarding self-confidence. However, with regard to the level of the cognitive aspects of anxiety the levels remained approximately the same. This also speaks in favour of the programme's effectiveness as the athletes had been exposed to objectively more difficult competitive conditions and the cognitive aspects of anxiety could have indeed be expected to rise (Cox, 1994). Doubting one's abilities and disturbances in concentration before a match, the two variables associated with the cognitive aspects of anxiety, were low both before and after the mental preparation programme.

Although positive indicators speaking in favour of the effectiveness of the programme were found in our research, it is not possible to claim with absolute certainty that the mental preparation did in fact influence the traits in question, especially since other factors in sports situations are very hard to control. It is truly difficult to separate the context of sports from an athlete's life circumstances and other situations.

While implementing the programme and analysing the results, we also gained an insight into the way the mental preparation programme could be further improved. The programme should, for instance, be integrated into the training process. Further, mental preparation exercises should be performed more frequently in order to make the programme even more effective. In addition, despite the fact that each athlete was supposed to follow an individualised programme, we are unable to determine how motivated and disciplined the athletes were when it came to performing individual exercises.

Regarding the shortcomings of our study, it should be noted that an obstacle arising from the size of the sample was encountered already at the outset of the study. We had to perform our study on a relatively small number of participants, which is one of the main deficiencies of our research. Despite our initial plan to perform the research on a number of sports teams, this proved to be quite difficult. Conditions in Slovenian club sports need to be taken into account here as well as the attitudes of club representatives, coaches and the athletes themselves towards psychology and mental training, the athletes' motivation for participating in the programme, their lack of time due to various competitions etc. To avoid the unmotivated participation of other sports teams, we decided to perform our study on a smaller sample. A small sample is a frequent shortcoming of evaluation studies that strive to look into the effectiveness of certain techniques. However, with an appropriate psychometric procedure the influence of a small sample can be successfully controlled (Cankar & Bajec, 2003). Apart from resorting to common statistical tests, we therefore also considered the effect-size coefficient in order to assess the size of differences between the first and second measurements.

On the practical level, the results of our research show the high applied value of the implemented mental preparation with its various psychological techniques (breathing exercises, autogenic training, hypnotic and posthypnotic suggestions, techniques for improving concentration, positive self-talk and visualisation). When athletes are motivated, psychological techniques can help them overcome many an obstacle on their career path; enhancing their precompetitive states is an important part of improving their results. In their study, Blumenstein and Lidor (2007) similarly found their four-year mental preparation programme to be effective. Perhaps the effectiveness of our programme would be even more clearly established if the treatment was longer. Nonetheless, our study definitely revealed positive effects of general mental preparation and psychological techniques on precompetitive states, especially on the level of concentration, the precompetitive somatic aspects of anxiety and greater self-confidence.

Further research should include bigger and more heterogeneous samples of athletes. In addition, the mental preparations could be more intense. The athletes in our sample also did not doubt their abilities much and reported very few problems with distractibility prior to competitions; athletes who report they experience difficulties controlling their precompetitive states should be included in future studies so as to allow researchers to assess an even wider area of potential progress.

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