The Influence of Psychological Factors on the Performance of Athletics Athletes in the 110 Meter Hurdles Race

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Abstract

Regarding the psychological training of athletes, we can affirm the fact that it is fundamental as it is carried out as part of the educational training of sports training, contributing to the formation of the basic mental qualities in the athlete's personality, qualities necessary to develop, form and finally, to produce that individual with results in sports activity. The athlete cannot be forced, but can be pushed in this direction. For this reason, the formation of a positive attitude towards psychological training has an important contribution. A psychological questionnaire validated at the level of Romania was applied, created in the direction of sports performance, it is structured on three sub-scales that measure cognitive anxiety, somatic anxiety and the level of self-confidence. The questionnaire includes a number of 27 items applied to a number of 7 athletes, finalists of the National Championships in the 110 meter hurdles race. Following the statistical analysis between the scores obtained during the preparation period and the competition period, carried out using the SPSS platform, we identified a significant result (p<0.05) for the psychological component cognitive anxiety. Through this interpretation we intend to establish the possible links between anxious states, emotions, discomfort states and agitation states in the training and competition periods.

Keywords: performance, athletics, 110 meter hurdles, questionnaire, psychological.

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1. Introduction

Athlete performance relies on both mental and physical strength in terms of athletic ability. This represents that psychological skills are important for optimal athletic performance (Williams, 2000). According to a study by Orlick and Partington, the psychological training of the Canadian national athletes who participated in the 1984 Los Angeles Olympic Games, the psychological component definitely influenced the number of medals won (Orlick, 1988). Sports psychological skills are techniques and strategies for achieving optimal performance by regulating negative psychological factors that overlap with the competitive act, such as anxiety, fear and frustration (Weinberg, 1995). The ability to cope with various emotional or psychological problems in sports is called sports psychological aptitude (Gould, 1988; Vealey, 1988). Hurdling reserves an athletic test in which cyclicity and cadence are the main assets that a guard athlete must possess (Iskra, 2019). The hurdles race takes place over a distance of 110 meters, a distance that must be covered at a pace of 3 steps, attacking the obstacle each time with the same foot (Otsuka, 2010; Iskra, 2000)

The scale used is Competitive State Anxiety Inventory -2 CSAI-2 (Martens, Vealy and Burton, 1990). It is a validated questionnaire for Romania and Europe, being specially created in the direction of sports performance that measures anxiety as a current state. This self-assessment scale contains 27 items and was applied to all athletes involved in this research, during the training period and during the competitive period, just to identify if there are differences. The questionnaire is structured on 3 sub-scales:

- cognitive anxiety: this is about the thoughts and ideas that induce and maintain the athlete's anxious states
- somatic anxiety: the manifestations of anxiety on a physiological level
- self-confidence: the confidence that he can face the challenge and achieve his proposed goal

The scores obtained are from min. 9 (low anxiety/confidence) to max.36 (high anxiety/confidence). In order to identify certain states of the athlete, it is necessary that this test be applied before training and then before the competition. Thus, we can make differences and establish what is the athlete's capacity for self-regulation, the optimal way in which they perform

(some athletes manage to mobilize best on high anxiety), their type of motivation or the ability to enter the contest state. An athlete who only uses extrinsic motivation is an athlete who will perform at limited capacity without an optimal level of competition.

2. Methods

Hypothesis: We assume that the main psychological components (cognitive, somatic anxiety and self-confidence) can have statistically significant correlations regarding the two preparation and competition periods.

The purpose of this study is to identify some laws between the three psychological components in two different periods of a performance athlete's preparation: training process and competitive duration.

The objective of this study is the testing of 7 finalist performance athletes of the national championships of Romania, both during the training period and during the competitive period through a psychological questionnaire validated at the country level, with a set of 27 questions.

In the following we will observe the differences between the results obtained by the subjects during the training period and those during the competition period. To validate the questionnaire, as well as to identify possible positive correlations between the psychological components within the two periods, we used the Alpha Cronbach test, respectively paired sample T-test, through the SPSS v. 20 platform.

To achieve the scores, we applied a questionnaire with 27 questions with 4 answer options in which the subjects had to choose according to their mental state in the two moments.

3. Results and discussions

In the case of the athlete C. V we see results with a good control of anxiety. If during the training period it has the value of 11 on cognitive anxiety, in the competition it increases to 17 (a small value, but stimulating enough to reach the competition mobilization). He has good body control,

somatic anxiety (14) and manages to maintain self-confidence at an optimal level. Confidence in his abilities is high (Table 1).

Name of the athlete	subscales	Training	Competition
C. V	Cognitive anxiety	11	17
	Somatic anxiety	14	16
	Confidence	32	33

Table 1. The results of the psychological testCompetitive State Anxiety Inventory – subject C.V

In table 2, the athlete obtains very close scores between the training state and the competition state. To the same extent, it can be about the situation in which the athlete offers what he considers to be desirable answers, those that he considered to be correct or expected from him (the idea of the coach's expectations that the athlete tries to fulfill them, the desire to cover insecurities or ego). Somatic anxiety has a value of 18 in competition, which shows us that the body feels an average competitive pressure. Self-confidence is at a high level, both in training and in competition.

Table 2. The results of psychological testCompetitive State Anxiety Inventory – subject 2 A. A

Name of the athlete	subscales	Training	Competition
A. A	Cognitive anxiety	12	14
	Somatic anxiety	14	18
	Confidence	33	34

We identify in table 3 important differences between the state of contest and that of competition. The mobilization is in optimal parameters, in the contest the anxiety is medium to high. What influences negatively is the decrease in self-confidence from the value of 31 in training to 24 in competition.

The results of this athlete are significant, in terms of mental mobilization and introduction to the state of competition. For good mobilization, it is also necessary to increase the anxiety between well-being and control in training and the pressure and desire to perform in competition. Thus, it goes from cognitive anxiety 9 (minimum value) in training, to 25 (medium to high value) in competition.

Subscales	Training	Competition	
Cognitive anxiety	9	25	
Somatic anxiety	9	26	
Confidence	31	24	
	Subscales Cognitive anxiety Somatic anxiety Confidence	SubscalesTrainingCognitive anxiety9Somatic anxiety9Confidence31	

Table 3. The results of psychological testCompetitive State Anxiety Inventory – subject 3 D. V

In the case of athlete D. C, we identify insignificant differences between the training state (cognitive anxiety 10) and the competition state (cognitive anxiety 11). The most important reasons are represented by extensive (competitive) experience or the fact that it provided desirable responses, concluding that such results are expected from athletes. Confidence in one's own abilities is a great competitive advantage, and he scores very high on this variable. These values also correspond to a period of positive development (upward trend) which provides good control of anxiety (Table 4).

Table 4. The results of psychological testCompetitive State Anxiety Inventory – subject 4 D. C

Name of the athlete	Subscales	Training	Competition
D. C	Cognitive anxiety	10	11
	Somatic anxiety	13	12
	Confidence	30	29

Athlete F. D has good mental mobilization, cognitive anxiety in training is at a minimum level, which proves that he feels safe and in control of his routine, and this can also be observed at the somatic level (value 10). Confidence in one's own abilities is at a high level (36). This thing changes in competition where cognitive anxiety increases by 4 points causing somatic anxiety to increase by 7 points. The pressure of competition brings a decrease in the score for the variable "self-confidence" around 28 points. From a psychological point of view, this athlete has a normal evolution, from safety

and control in the training part to registering an anxiety in average values in a competitive context (Table 5).

Name of the athlete	Subscales	Training	Competition
F. D	Cognitive anxiety	9	13
	Somatic anxiety	10	17
	Confidence	36	28

Table 5. The results of psychological testCompetitive State Anxiety Inventory – subject 5 F. D

Athlete R. R has minimal anxiety in both training and competition. The values for cognitive anxiety are identical in both situations, on the somatic level the variation of 1 point is insignificant. In this context, he shows a self-confidence at high values in training (32 points), which rises in the competition pressure scale to the value of 35 (almost the maximum). We conclude that he is an athlete with high competitive experience or low intrinsic motivation (Table 6).

Table 6. The results of psychological testCompetitive State Anxiety Inventory – subject 6 R. R

Name of the athlete	Subscales Training		Competition
R. R	Cognitive anxiety 11		11
	Somatic anxiety	17	18
	Confidence	32	35

Athlete S. D has an interesting pattern of development from a psychological point of view. He has an average cognitive anxiety in training (22 points) and a high one in competition (32 points). Somatic anxiety also follows the pattern of cognitive anxiety and increases from medium (24) to medium/high (28).

We find that this athlete registers an average level of self-confidence even in training. We usually find this situation in the athlete with an average competitive experience or in the situation of a falling period. He shows high anxiety in the competition, but even during the training period he is not in the optimal parameters. We also encounter athletes who deliberately induce states of agitation/anxiety in training and competition, on the principle that agitation helps them develop maximum energy and thus achieve a maximum level of performance (Table 7).

Name of the athlete	Subscales	Training	Competition
S. D	Cognitive anxiety	22	32
	Somatic anxiety	24	28
	Confidence	28	20

Table 7. The results of psychological testCompetitive State Anxiety Inventory – subject 7 S. D

Most authors state that the degree of correlation must have a value >/= .7, and in the situation where no. items is below ten should have a value >0.5. Most authors follow a basic rule, such as that the Cronbach's alpha value must reach an index of 0.70, for that instrument, test to have an optimal level of coherence (Keith, 2018). In the situation presented previously, the Cronbach alpha index has a significant value (> .70) (Table 8).

Table 8. Cronbach's Alpha Coefficient on the Anxiety Scale

No of subjects	Testing	Alpha Cronbach	Standardized items	No of items
7	Anxiety Scale	.728	.829	26

The yellow color represents the ideal value that each athlete should record while the gray color represents the worst score. The blue and orange colors respectively represent the scores obtained during the preparation and competition periods. The best scores were 26 obtained by D. V respectively 28 obtained by S. D exceeding the threshold of the average value, specifying that the difference between the score obtained in training versus the competition (in the case of subject 3) is a considerable one, which reflects a mobilization optimal psyche for the competition state. The scores obtained by subject two A. A and six R. R. are not so relevant because compared to the training values they are not significant (Figure 1).



Figure 1. Graphical representation of the results - Cognitive anxiety

In the case of the sub-scale representing self-confidence, we obtained the highest scores of all three applied, both in the training part and in the competition part. In the case of subject seven S. D, lower values were identified (20, respectively 28) contrary to the good results obtained in the other subscales and compared to the other athletes. All the indicators in Figure 2 demonstrate that they have a high level of confidence both during the training period and during the competitions.



Figure 2. Graphical representation of the results – Self-confidence

As we can see in Figure 3, we obtained a series of percentage values regarding the results obtained following the application of the questionnaire and their interpretation. The sum of all the results obtained in the three subscales: cognitive anxiety, somatic anxiety and self-confidence, both during the preparation period and during the competition period, was obtained. The reference values that represent the ideal of the athlete's psychological profile are framed as a score between 9 (anxiety/low confidence) and 36 (anxiety/high confidence). The highest percentage values obtained within the averages are found next to the self-confidence scale both in training and in competition (23 and 26%, respectively).



Figure 3. Percentage representation of the results - Anxiety scale

3.1. Statistical analysis of the psychological questionnaire

Following the statistical analysis between the scores obtained during the preparation period and the competition period, carried out using the SPSS platform, in table 9, we identified a significant threshold (p<0.05) for the psychological component called cognitive anxiety. Through this interpretation we intend to establish the possible links between anxious states, emotions, discomfort states and agitation states in the training and competition periods.

No	The psychological component	Mean	Standard deviation	Standard error of the mean	t	p<0.05
1	Cognitive anxiety	-5,5714	5,7113	2,1586	-2,581	.042
2	Somatic anxiety	-4,8571	5,9281	2,2406	-2,168	.073
3	Confidence	2,7142	4,7858	1,8089	1,501	.184

Table 9. Statistical interpretation of the scores obtained on the psychological questionnaire

p<0.05

Athletes face a psychological barrier during competitions; therefore, not only optimal physical ability and skills, but also the psychological ability to manage fear and anxiety are important in Taekwondo (Eom, 2013). As we can see in what the author Eom mentioned, the psychological components are important in any sports branch, especially when we refer to contact sports or those in direct combat with the opponent.

4. Conclusions

Finally, we can state that a significant relationship between the three psychological components, within the two test periods, can only be established between cognitive anxiety at the level of training and competition. This demonstrates that there are differences between the scores obtained by the subjects included in the research and that there is a possibility that some performances within the competitions are influenced by this identified difference. At the group level, on somatic anxiety and self-confidence, no difference was noticed, which is why we consider that the sports performances obtained by the athletes were not influenced.

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