

Publication date: 1.03.2021

DOI: 10.51871/2588-0500_2021_05_01_23

UDC 159:955; 796

PSYCHOLOGICAL READINESS AS A FACTOR OF PERFORMANCE OF SHOOTING ACTIVITY OF POLYATHLON ATHLETES

V.N. Smolentseva, N.E. Masnyuk

FSBEI of HE “Siberian State University of Physical Education and Sports”,
Omsk, Russia

Key words: polyathlon athletes, effectiveness of shooting activity, psychological readiness.

Annotation: Ambiguous results of shooting activity of polyathlon athletes revealed the need to study and improve the psychological readiness of athletes using psychological measures. Organization of psychological training sessions with participation of athletes involved in winter polyathlon was carried out taking into account the specificity of shooting activity: abilities of athletes to regulate the psychoemotional state, control of breathing pattern, focus on attention on an object, distracting from interference, and differentiate muscle tension when the trigger is pulled were improved. Positive results were obtained after the experiment, indicating the improvement of individual psychological special features of athletes that determine psychological readiness, which, in turn, contributes to growth of results of shooting activity.

Introduction. The winter polyathlon, which is a complex multisport competition, includes shooting training for athletes, which, according to experts' opinion and taking the specificity of this type of sports into account, increases significance of the psychological aspect in competition conditions [1, 3, 4].

The purpose of this study is to obtain new knowledge about psychological factors that support the effectiveness of shooting activity.

In accordance to the purpose, next tasks of the study were set: registering results of shooting activity of polyathlon athletes taking their psychological readiness into account; development of psychological training session contents, aimed at the improvement of the psychological readiness of polyathlon athletes; registering of the effectiveness of shooting activity of polyathlon athletes before and after the psychological training.

Methods and organization. Theoretical analysis and the review of the literature data on the field of research, testing, expert evaluation of shooting activity,

pedagogical experiment, mathematical and statistical processing of indicators were used. Indicators, which were examined in this study, were:

\bar{X} – the arithmetic mean;

σ – the mean square deviation;

r – the rank correlation coefficient;

t – the criteria of the Student's t-test.

18 polyathlon athletes with the I Grade of sports, aged 16-17 years, participated in the study.

Results and discussion. The effectiveness of shooting activity was assessed according to the 100-point system. Subjects made 10 shots with a pneumatic rifle on 5 targets from 10-meter distance within 10 minutes.

During the analysis of protocols of the effectiveness of shooting activity, high indicators were registered in 10 subjects (87 ± 1 points); average and low indicators were registered in 8 subjects (87 ± 1 points).

Ambiguous results of shooting activity revealed a need to study the psychological readiness of athletes.

The pedagogical examination was conducted during training sessions, control trainings and competitions in order to reveal the manner of non-verbal signs of the psychoemotional state (facial expression, look, pose and other behavioral responses). A special attention is given to the manner of breathing (rhythm, depth, rate) during preparation of shooting, taking the specificity of shooting activity into account, which has an impact in its effectiveness. Before shooting activity, indicators of individual minute, heart rate (HR) were registered in order to reveal deviations in indicators, which were registered in athletes at the state of relative psychological and functional rest.

An analysis of results of the shooting activity study, taking the manner of the psychoemotional state into account, revealed the need to divide athletes into two groups: the first group included 10 subjects (55,5%) in optimal competitive mood, who were demonstrating high results in shooting; the second group included 8 subjects (45,5%), who were in the state of an excessive agitation, in some cases this state turned into apathy ("burned out"), which significantly decreased results of shooting activity.

Taking experts' opinions on forming a manner of the prestart psychoemotional state of individual and psychological special features of athletes and the specificity of polyathlon into account, the study of the nervous system, personal anxiety and attention features was conducted (Table 1).

In the first group of subjects the optimal level of personal anxiety ($36\pm 2,4$ points), high attention span ($0,9\pm 0,1$ standard units), high and average indicators of nervous processes at 60% and 40% respectively were revealed.

In the second group of subjects indicators of personal anxiety were $48,5\pm 1,5$ in average, which indicate an increased level of these indicators, average indicators of attention span were also revealed ($0,6\pm 0,1$ standard units), the number of athletes with indicators of medium and weak strength of nervous processes in this group were equal, 50% each.

Table 1

Indicators of the effectiveness of shooting activity and individual psychological features of polyathlon athletes ($n=18$), ($\bar{x}\pm\sigma$)

№	Examined indicators	Polyathlon athletes groups		P<
		first (n=10)	second (n=8)	
1.	Results of shooting activity (points)	87 ± 1	69 ± 3	0,05
2.	Individual minute (10 s) «-» underrating (s) «+» overrating (s)	« - » $0,75\pm 0,2$	« - » $1,9\pm 0,1$	0,05
3.	Heart rate monitoring (beats/min) (deviation from the indicator at rest on competitions)	$65,5\pm 1,5$ $11,0\pm 3,0$	$65,5\pm 1,5$ $31,0\pm 2,5$	- 0,01
	Personal anxiety level (points)	$36\pm 2,4$	$48,5\pm 1,5$	0,05
	Attention span (standard units)	$0,9\pm 0,1$	$0,6\pm 0,1$	0,05
4.	Non-verbal manifestations of the psychoemotional state	Confident look, open pose, calm speech	Stiff face, anxious look, excessive gesturing and talkativeness or avoiding contact	

Taking experts' opinions on forming a manner of the prestart psychoemotional state of individual and psychological special features of athletes and the specificity of polyathlon into account, the study of the nervous system, personal anxiety and attention features was conducted (Table 1).

In the first group of subjects the optimal level of personal anxiety ($36 \pm 2,4$ points), high attention span ($0,9 \pm 0,1$ standard units), high and average indicators of nervous processes at 60% and 40% respectively were revealed.

In the second group of subjects indicators of personal anxiety were $48,5 \pm 1,5$ in average, which indicate an increased level of these indicators, average indicators of attention span were also revealed ($0,6 \pm 0,1$ standard units), the number of athletes with indicators of medium and weak strength of nervous processes in this group were equal, 50% each.

During the study of the relationship of individual and psychological special features with the effectiveness of shooting activity, indicators were found to be above average among all the studied indicators, the closest relation was found with personal anxiety and attention span (Table 2).

Table 2

Relationship between individual and psychological special features and the effectiveness of shooting activity of polyathlon athletes (coefficient, r)

№	Individual and psychological special features	Shooting activity (points)
1.	Personal anxiety (points)	-0,72
2.	Attention span (standard units)	0,89
3.	Deviations from average HR indicator at rest (beats/min)	-0,62
4.	Individual minute (10 s.) «-» underrating	-0,64

Organization and conducting psychological training sessions were carried out in order to improve abilities of athletes to regulate the psychoemotional state, control the breathing pattern, focus on attention on an object, distracting from interference, and differentiate muscle tension when the trigger of the gun is pulled.

Taking specificity of shooting activity into account, next psychological techniques were used:

- “Relaxation techniques” – such psychological techniques allowed athletes to gain abilities to lower the psychoemotional tension voluntarily and to differentiate the degree of muscle tension;

- “Concentration techniques” – such techniques contributed to the improvement of concentration processes and absorption on an object during the given timespan;

- “Visual techniques” – were used in order to use mental and visual images taking the specificity of shooting activity into account, i.e. repeating the working

state, including relaxation and mobilization, mental visualization of successful performance with a full repeat of situation's perception;

- "Breathing techniques" – were used to improve abilities to regulate depth, rate, consistency and rhythm of breathing in polyathlon athletes.

The sessions were held at any convenient time for athletes. 26 sessions were held in total, 20-30 minutes long, athletes were also given recommendations to use psychological techniques by themselves, taking individual and psychological special features and the prevailing nature of the psychoemotional state in competition conditions into account.

After psychological training sessions, personal anxiety indicators were decreased ($48,5 \pm 1,5$ and $44,0 \pm 0,5$), attention span indicators were increased ($0,6 \pm 0,1$ и $0,7 \pm 0,1$), athletes demonstrated the ability to regulate the psychoemotional state in competition conditions.

During the expert evaluation of results of shooting activity of polyathlon athletes, a significant increase ($69,4 \pm 1,9$ and $74,6 \pm 1,2$) of its effectiveness was registered in the second group (Table 3).

Table 3

Results of shooting activity of polyathlon athletes after the experiment
($n=18$), ($\bar{x} \pm \sigma$)

№	Subject groups	Shooting activity (points)		P<
		before the experiment	after the experiment	
1.	First group ($n=10$)	$87,0 \pm 1,0$	$87,5 \pm 0,9$	-
2.	Second group ($n=8$)	$69,4 \pm 1,9$	$74,6 \pm 1,2$	0,05

Conclusion. The analysis of results of the conducted experiment allows suggesting the significant impact of the psychological factor on the effectiveness of sports training of polyathlon athletes and the need to recommend psychological techniques aimed at the improvement of individual psychological special features of athletes that determine psychological readiness, which, in turn, contributes to growth of results of shooting activity.

References

1. Vodoleeva V.A. Winter polyathlon: fundamentals of training process: Learning guidelines / V.A. Vodoleeva // Gorno-Altai: GASU. – 2012. – 88 p.
2. Volkov I.P. Regulation of mental states of athletes during preparation for competitions: guidelines / I.P. Volkov // St. Petersburg. – 2009. – 23 p.

3. Smolentseva V.N. On psychological techniques, mental states in sport and their regulation: learning guidelines / V.N. Smolentseva // Omsk: SibSUPC – 2008. – 92 p.

4. Starovojt R.V. An innovative method of training athletes in winter polyathlon: abstr. of the diss. ... Candidate of Pedagogical Sciences: 13.00.08 / Starovojt Roman Vladimirovich // Moscow. – 2012. – 23 p.

Spisok literary

1. Vodoleeva V.A. Zimnij poliatlon: osnovy trenirovochnogo protsessa: uchebno-metodicheskoye posobiye / V.A. Vodoleeva // Gorno-Altaysk: GAGU. – 2012. – 88 p.

2. Volkov I.P. Regulyatsiya psikhicheskikh sostoyanij sportsmenov v period podgotovki k sorevnovaniyam: metodicheskiye rekomendatsii/ I.P. Volkov // Sankt-Peterburg. – 2009. – 23 p.

3. Smolentseva V.N. O psixhoteknikakh, psikhicheskikh sostoyaniyakh v sporte i ikh regulyatsii: uchebno-metodicheskoye posobiye / V.N. Smolentseva // Omsk: SibGUFK – 2008. – 92 p.

4. Starovojt R.V. Innovatsionnaya metodika podgotovki sportsmenov v zimnem poliatlone: avtoref. dis. ... kand.ped.nauk: 13.00.08 / Starovojt Roman Vladimirovich // Moskva. – 2012. – 23 p.

Information about the authors: Smolentseva Valentina Nikolaevna – Doctor of Psychological Sciences, Professor of the Department of Pedagogy and Psychology of the FSBEI of HE “Siberian State University of Physical Culture and Sports” (FSBEI of HE SibSUPC), Omsk, e-mail: Valentinaomsk333@yandex.ru;
Masnyuk Natalya Eduardovna – Master’s Student of the Department of Pedagogy and Psychology of the FSBEI of HE “Siberian State University of Physical Culture and Sports” (FSBEI of HE SibSUPC), Omsk.