

Mental properties' formation of the personality of athletes specializing in taekwondo

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Abstract. Purpose: to determine the characteristics of the manifestation of the mental properties of athletes' personality in taekwondo. **Material and methods:** 10 qualified athletes specializing in taekwondo were involved in research. All participants are members of national team of Ukraine on taekwondo. The average age of athletes was 16,7±1,2 years. The studies were conducted during the training camp. All were assigned to the same experimental task. In this experiment, informed consent was obtained from all participants and their parents. For assessing the athletes' psychological features, the following methods were used: theoretical analysis and synthesis of scientific literature and specialized websites, Eysenck Personality Questionnaire, diagnosis of communicative tolerance by V. Boyko, test «Inventory of stress symptoms» by V. Ivanchenko, methods of mathematical statistics. **Results:** among taekwondo athletes choleric and phlegmatic types of temperament prevalence. Athletes is characterized by average level of neuroticism and stress, combined with a high level of communicative tolerance. Psychological factors occupy an important place in the system of preparation of athletes specializing in taekwondo and are associated with the development of processes of attention, thinking and perception in combination with temporal-spatial orientation abilities. Under the influence of intense physical exertion, taekwondo athletes form a strong and balanced nervous system, as well as pronounced volitional qualities. **Conclusions.** The presence of specialized mental processes and qualities allows to the athlete to realize his physical and technical-tactical capabilities, that lead to the high-level achievement in sport. These include: the accuracy of the mental reflection of the perceived information, the time sense and distance sense, instantly find the right moments for strikes and defenses, a high level of concentration, fast reaction, well-developed thinking processes that allow to evaluate the combat situation quickly and objectively.

Keywords: psychology, taekwondo, mental properties, personality, questionnaire.

Introduction. Modern sport requires extremely high demands from athletes regarding their physical and mental capability (Платонов, 2015). A constantly increasing intensity of physical exertion has a direct impact on: the characteristics of the manifestations of the mental properties of the athletes' personality; the degree of their mental adaptation; as well as the formation and development of individual typological characteristics (Vysochina, et al., 2018). The theoretical aspects of training in sports have been studied by many specialists (Pityn, et al., 2019; Sánchez-López, et al., 2013). Also, scientists have conducted empirical research in sports (Schack, 2012; Solanki, & Singh, 2013; Sotoodeh, et al., 2012).

The problem of mental properties' formation was researched by the example of athletes specializing in taekwondo. The taekwondo is one of the most technically and psychologically challenging sports that requires an athlete to have a high speed of thinking, a strong and mobile nervous system, concentration, developed anticipation abilities, skills to manage the emotional sphere and motor actions synchronously (Bridge, et al., 2014).

Taekwondo is an effective mean for physical and moral improvement, harmonious development of the personality. It forms the person's internal culture, his or her character and strong-willed qualities, which allows the athlete to have a high level of responsibility and self-control (Lee, & Kayvon, 2009;

Ortenburger, 2015). The development of these qualities makes high demands on the psychological preparation of an athlete (Iermakov, 2016; Vysochina, 2016).

Purpose: to determine the characteristics of the manifestation of the mental properties of athletes' personality in taekwondo.

Material and methods. Participants. 10 qualified athletes specializing in taekwondo were involved in research. All participants are members of national team of Ukraine on taekwondo. The average age of athletes was $16,7 \pm 1,2$ years. The studies were conducted during the training camp. All were assigned to the same experimental task. In this experiment, informed consent was obtained from all participants and their parents.

Organization of research. For assessing the athletes' psychological features, the following methods were used: theoretical analysis and synthesis of scientific literature and specialized websites, Eysenck Personality Questionnaire, diagnosis of communicative tolerance by V. Boyko, test «Inventory of stress symptoms» by V. Ivanchenko, methods of mathematical statistics.

Eysenck Personality Questionnaire for the type of temperament determining (using a 24-point scale) allows to identify the predominant type of temperament; assess the expression of individual mental qualities: introversion-extraversion and neuroticism (emotional instability). The type of temperament was determined by the most manifested characteristics. The scale of introversion-extraversion was interpreted using the scale: 1-4 points – deep introvert; 5-8 points – introvert; 9-15 points – between introversion and extraversion; 16-19 points – extravert; 20-24 points – deep extravert. The scale of neuroticism was interpreted using the scale: 0-6 points – low level of neuroticism; 7-13 points – average level of neuroticism; 14-18 points – high level of neuroticism; 19–24 points – very high level of neuroticism.

The Boyko test was used for identification of athlete's weaknesses, behavioral reactions, strategies and attitudes in interpersonal communication, which should

be adjusted to make the communication process pleasant and effective. 9 criteria were evaluated: accepting people, evaluating people, categoricity, tolerance, dominance, egoism, touchiness, criticality, adaptability. The results of test were interpreted using the scale: 1–5 points – high level of tolerance; 6–10 points – average level of tolerance; 11–15 points – low level of tolerance.

The general level of athletes' stress, including its components (psychological and physiological stress) were studied by the V. Ivanchenko's method modified by us (Гуніна, & Височіна, 2013). Assessment of the level of psycho-physiological stress allows to determine the degree of external factors' influence on the psychological and physiological state of the athlete; to identify the features of his or her individual reaction.

Statistical analysis. All indicators were calculated as absolute and relative (%) value. Pearson criterion was used for correlation calculation.

Results. Among the most important characteristics of the taekwondo athletes' psyche are: ability to precision of spatio-temporal perception, orientation of the athlete on the ring, variety of the fighting position, sense of strike, sense of distance, sense of time, sense of freedom.

One of the main features of specialized sensations of the taekwondo athletes' is the ability to precision of spatio-temporal perception. This ability is responsible for orienting an athlete in the ring, position of his body, sense of strike, sense of distance, freedom of movement, sense of time; and it depends on the speed of the athlete's reaction, the level of development of attention and thinking. These parameters have a complex effect on the psyche of an athlete (Kozina, et al., 2015; Romoldanova, et al., 2021). The ability to precision of spatio-temporal perception influence on the technique of movements and developing of specialized musculoskeletal qualities.

Orientation of the athlete on the ring is developed as a result of the training and combat experience. A taekwondo athlete must be able to determine her position on the ring (distance to corners and edges of the ring) at

any time during performing maneuvers, attacks, counterattacks of the enemy and protection from his attacks. To develop the ability of orientation on the ring, athlete should practice exercises in movement (Ghorbanzadeh, et al., 2011).

During the combat a taekwondo athlete is constantly in search of a comfortable body position in relation to the enemy for attacks, defenses and counterattacks. This searching allows to athlete to learn how to vary the fighting position and creates the prerequisites for successful combat activity. For developing this ability, specialized exercises on the mechanics of strikes and defenses are used.

The development of a sense of strike in taekwondo is associated with the athlete's ability to perceive the speed of action and taking into account the moment of contact of the fist or foot with the goal, as well as the ability to accurately strike blows of different strength, speed and length from different starting positions. The sense of strike could be developed during performing exercises on bags, shells and paws. For better feeling the place where the blow is struck, athlete should train not in combat gloves, but in gloves for shells or chingards (Podrigalo, et al., 2019).

Sense of distance – the ability of an athlete to determine the distance to the opponent precisely during an attack and during defense in taekwondo. The sense of distance depends on the manner in which an athlete conducts a battle: attacking, counterattacking, or protective actions. The best way to develop a sense of distance is fighting in pairs. The sense of distance helps the athlete to choose the right moment of attack and is associated with a sense of time (Polianychko, et al., 2018).

The athlete's sense of time is determined by the characteristics of the psychophysiological processes. This ability depends on the balance of the processes of excitation and inhibition in the cerebral

cortex, which creates the prerequisites for performing motor actions timely. A well-developed sense of time allows the athlete to assess accurately the duration of the time intervals of combat actions and rationally expend energy. The sense of time develops mainly in battle with a partner, as well as in exercises on fast-moving shells.

An important feature of taekwondo mastery is the ability to regulate the degree of physical stress, to stay in a combat freely and naturally. To develop a sense of freedom, it is necessary to have well-developed agility and coordination of movements and the right technique in combination with the optimal alternation of the processes of relaxation and muscle tension, the ability to strike with different strengths. The feeling of freedom is associated with the athlete's high self-estimation and self-confidence (Dierdorff, et al., 2011; Vysochina, & Vorobiova, 2017).

The analysis of indicators of the psychological properties of personality of athletes specializing in taekwondo indicates the predominance of a choleric type of temperament: choleric – 30 %; phlegmatic – 20 %; phlegmatic-sanguine – 20 %; sanguine – 10 %; melancholic – 10 %; choleric-melancholic – 10 %. At the same time, the average extroversion score is $12,4 \pm 3,4$ points (between introversion and extraversion), and neuroticism – $10,8 \pm 5,2$ points (the average level of neuroticism), which indicates that the basic mental qualities of taekwondo representatives are the strength and balance of the nervous system (table 1).

Mostly athletes specializing in taekwondo have an aggregate level of stress ($34,80 \pm 6,05$ points), including the level of psychological ($18,20 \pm 3,26$ points) and physiological ($16,60 \pm 3,27$ points) stress. The exception were athletes with phlegmatic type of temperament, who have low stress indicators due to the specifics of the functioning of their nervous system (fig. 1).

Table 1

Assessment of the individual indicators of the type of temperament and level of stress of athletes specializing in taekwondo (n=10), points

№	Introversion-extraversion	Neuroticism	Psychological stress	Physiological stress	Aggregate level of stress
1	8	4	15	12	27
2	12	13	20	20	40
3	12	7	12	14	26
4	17	13	21	22	43
5	9	16	20	18	38
6	17	13	20	17	37
7	8	8	14	14	28
8	12	4	19	13	32
9	14	10	20	19	39
10	15	20	21	17	38

Estimation of the results of the correlation analysis shows that a positive correlation (according to the Pearson criterion) is observed between the indicators of extraversion and the level of stress ($r=0,65$,

$p<0,05$); neuroticism (or emotional instability) and the level of stress ($r=0,71$, $p<0,05$), which indicates a direct effect of the athlete's temperament on the regulation of the functional state of the nervous system.

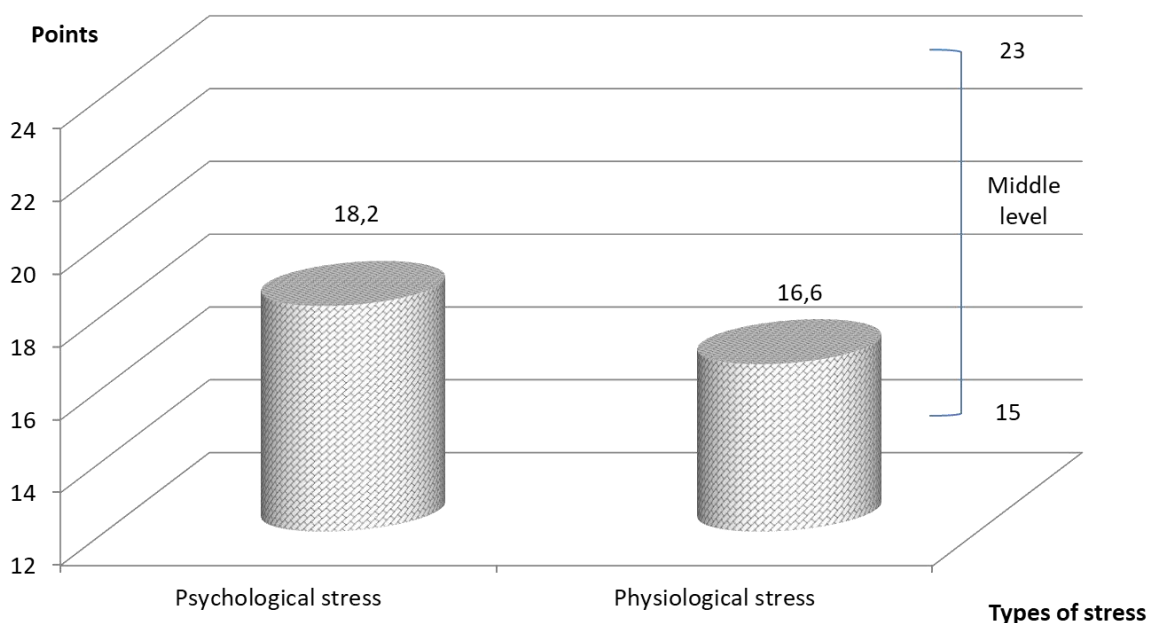


Figure.1. Comparison of indicators of psychological and physiological stress of athletes specializing in taekwondo (n=10)

The diagnostic of communicative tolerance of athletes specializing in taekwondo showed the high level of tolerance

in all indicators except categoricity, where the average level of tolerance was indicated (table 2).

Table 2

Assessment of the elements of communicative tolerance of athletes specializing in taekwondo (n=10), points

	Qualities	Mean	SD
1	Accepting people	4,9	2,08
2	People evaluating	4,3	1,89
3	Categoricity	5,6	1,26
4	Tolerance	4,6	2,01
5	Dominance	4,3	1,42
6	Egoism	3,9	1,97
7	Touchiness	4,2	2,30
8	Criticality	4,3	2,11
9	Adaptability	3,8	2,04
Total points:		39,7	9,35

A study of the indicators of communicative tolerance shows that the most stable and highest indicator of the psyche of athletes specializing in taekwondo is categoricity (5,60±1,26 points). It is expressed in the form of increased demands and irritability to the others' disadvantages. This may be due to the extremely high level of self-discipline and self-regulation of athletes, and influence on expected behavioral reactions from other people, which in most cases leads to disappointment.

The smallest values among the characteristics of communicative tolerance were obtained on the scales of Egoism (3,9±1,97 points) and Adaptability (3,8±2,04 points). That means, that athletes specializing in taekwondo have a high degree of self-control and ability to adapt to difficult life circumstances.

There is a correlation between physiological stress indicators and the level of dominance (r=0,65, p<0,05). This relationship indicates that the higher motivation and the greater level of athletes' orientation for success achieving leads to more pronounced signs of nervous system excitement, and vice versa. The signs of nervous system excitement manifests in the form of physiological discomfort (tremor of the extremities, increased sweating, etc.). Psychological stress has a positive correlation with tolerance (r=0,73, p<0,05) – a low level of psychological stress indicates moderate

mental stamina of athletes specializing in taekwondo.

It seems interesting that there is a correlation between indicators of extraversion and sensitivity (r=0,55, p<0,05), extraversion and tolerance (r=0,65, p<0,05), as well as between indicators of neuroticism and criticality (r=0,56, p<0,05). Such results allow to characterizes athletes specializing in taekwondo as individuals, who are demanding of themselves, emotional, strong-willed and mentally stable.

Conclusions.

Intensive physical exertion requires serious psychological training for a taekwondo athlete, which is a long and complex process and involves the formation and development of not only the athlete's skills, but also his emotional and volitional sphere, character traits, views, and ability for long and efficiently work carrying out. The main features of the manifestation of mental personality traits of athletes in taekwondo are choleric type of temperament – over 30 %, at the same time, the average extroversion score is 12,4±3,4 points, and neuroticism – 10,8±5,2 points, which indicates that the basic mental qualities of taekwondo representatives are the strength and balance of the nervous system, which is confirmed aggregate level of stress (34,80±6,05 points), including the level of psychological (18,20±3,26 points) and physiological (16,60±3,27 points) stress.

The presence of specialized mental processes and qualities allows to the athlete to

realize his physical and technical-tactical capabilities, that lead to the high-level achievement in sport. These include: the accuracy of the mental reflection of the perceived information, the time sense and distance sense, instantly find the right moments for strikes and defenses, a high level of concentration, fast reaction, well-developed

thinking processes that allow to evaluate the combat situation quickly and objectively.

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Анотація. Височіна Н., Ромолданова І., Кузнецова О. **Формування психічних властивостей особистості спортсменів, що займаються тхеквондо. Мета:** визначити особливості прояву психічних властивостей особистості спортсменів у тхеквондо. **Матеріал і методи.** У дослідженні брали участь 10 кваліфікованих спортсменів, що спеціалізуються у тхеквондо. Усі учасники є членами збірної України з тхеквондо. Середній вік спортсменів становив $16,7 \pm 1,2$ року. Дослідження проводились під час тренувальних зборів. Усім було поставлено одне й те саме експериментальне завдання. В експерименті від усіх учасників та їхніх батьків було отримано інформовану згоду. Для оцінки психологічних особливостей спортсменів використовувалися такі методи: теоретичний аналіз та синтез наукової літератури та спеціалізованих сайтів, особистісний опитувальник Г. Айзенка, діагностика комунікативної толерантності В. Бойка, тест «Інвентаризація симптомів стресу» В. Іванченка, методи математичної статистики. **Результати:** серед тхеквондистів переважають холеричний та флегматичний типи темпераменту. Спортсмени характеризуються середнім рівнем нейротизму та стресостійкості у поєднанні з високим рівнем комунікативної толерантності. Психологічні фактори займають важливе місце в системі підготовки спортсменів, що спеціалізуються в тхеквондо, і пов'язані з розвитком процесів уваги, мислення та сприйняття у поєднанні зі здібностями до просторово-часової орієнтації. Під впливом інтенсивних фізичних навантажень у тхеквондистів формується сильна та зрівноважена нервова система, а також яскраво виражені вольові якості. **Висновки.** Наявність спеціалізованих психічних процесів та якостей дозволяє спортсмену реалізувати свої фізичні та техніко-тактичні можливості, що приводить до високих досягнень у спорті. До них відносяться: точність уявного відображення інформації, що сприймається, почуття часу та відстані, миттєве знаходження потрібних моментів для ударів та захистів, високий рівень концентрації уваги, швидка реакція, добре розвинені розумові процеси, що дозволяють оцінювати бойову обстановку швидко та об'єктивно.

Ключові слова: психологія, тхеквондо, психічні властивості, особистість, опитувальник.

Аннотация. Височина Н., Ромолданова И., Кузнецова Е. **Формирование психических свойств личности спортсменов, занимающихся тхэквондо. Цель:** определить особенности проявления психических свойств личности спортсменов в тхэквондо. **Материал и методы.** В исследовании принимали участие 10 квалифицированных

спортсменов, специализирующихся в тхэквондо. Все участники являются членами сборной Украины по тхэквондо. Средний возраст спортсменов составил $16,7 \pm 1,2$ года. Исследования проводились во время тренировочных сборов. Всем была поставлена одна и та же экспериментальная задача. В эксперименте от всех участников и их родителей было получено информированное согласие. Для оценки психологических особенностей спортсменов использовались следующие методы: теоретический анализ и синтез научной литературы и специализированных сайтов, личностный опросник Г. Айзенка, диагностика коммуникативной толерантности В. Бойко, тест «Инвентаризация симптомов стресса» В. Иванченко, методы математической статистики. **Результаты:** среди тхэквондистов преобладают холерический и флегматический типы темперамента. Спортсмены характеризуются средним уровнем нейротизма и стрессоустойчивости в сочетании с высоким уровнем коммуникативной толерантности. Психологические факторы занимают важное место в системе подготовки спортсменов, специализирующихся в тхэквондо, и связаны с развитием процессов внимания, мышления и восприятия в сочетании со способностями к пространственно-временной ориентации. Под влиянием интенсивных физических нагрузок у тхэквондистов формируется сильная и уравновешенная нервная система, а также ярко выраженные волевые качества. **Выводы.** Наличие специализированных психических процессов и качеств позволяет спортсмену реализовать свои физические и технико-тактические возможности, что приводит к высоким достижениям в спорте. К ним относятся: точность мысленного отражения воспринимаемой информации, чувство времени и расстояния, мгновенное нахождение нужных моментов для ударов и защит, высокий уровень концентрации внимания, быстрая реакция, хорошо развитые мыслительные процессы, позволяющие оценивать боевую обстановку быстро и объективно.

Ключевые слова: психология, тхэквондо, психические свойства, личность, опросник.

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