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Psycho-Physiological Aspects in Karate Sports Preparation

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Aspekt psycho-fizjologiczny przygotowania sportowego w karate

Streszczenie

W naszym artykule, który ma charakter przeglądowy, porównaliśmy wnioski (wyniki badań) z kilkunastu artykułów o charakterze naukowym. Staraliśmy się wskazać, w jakim stopniu aspekty psychofizjologiczne w tradycyjnych sztukach walki są zaangażowane w projektowanie (planowanie i przygotowanie) treningu sportu w karate. Próbowaliśmy zbliżyć się do postrzegania różnicy pomiędzy sztukami walki a sportami walki, podkreślając psychologiczny wymiar treningu w karate sportowym w stosunku do treningu fizycznego. Jednocześnie szukaliśmy relacji, dających nam odpowiedź, który z tych aspektów jest bardziej skuteczny pod względem osiągniętych wyników sportowych. W naszej analizie treści opracowań naukowych staraliśmy się podkreślić sposoby rozwoju osobowości i motywacji sportowca w kontekście treningu sportowego w dziedzinie karate. Podsumowując te rozważania, na podstawie pogłębionej i kompleksowej analizy treści ustaleń zwracamy uwagę na fakt, że tylko wzajemna korelacja obu wybranych aspektów może dać pożądane (zamierzone) wyniki sportowe w ramach treningu sportowego w karate.

Słowa kluczowe: sztuka walki, karate, psycho-fizjologiczny trening sportowy, wyniki sportowe.

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Abstract

In the study we tried to point out, on the basis of comparison conclusions of several research works, how much the psycho-physiological aspects contribute to influencing the conception of sport preparation in terms of philosophical context of preparation in traditional martial arts. We elucidated the perception of the difference between martial arts and combat sports and emphasized the psychological dimension of training in sports karate in relation to physical training. At the same time, we were looking for relationships that would give us an answer as to which of these aspects are more effective in terms of sports performance. In conclusion, on the basis of a comprehensive content analysis of the findings we draw attention to the fact that only the mutual correlation of both selected aspects can achieve the desired results in the training of karate practitioners.

Keywords: martial arts, combat sports, karate, psycho-physiological sports training, sport performance.

Introduction

In the introductory part of the thesis, we consider it important to specify basic concepts with which we will continue our work. Martial art is a movement system that has evolved from old ways of fighting and is now implemented as a part of a way of life with the goal to preserve tradition and cultural heritage [18]. We agree with the opinion [25] that the set of movement elements which appear in martial arts is created according to the somatic-psycho-philosophical principles, and their active development leads to the utilization of physical and mental potential. Karate-dō can be characterized as a weaponless combat system. Limbs and body parts are used to attack or defend. In practice, the used translation means art or path of an empty hand [22].

In different spheres of sport, we meet the basic notion that sports training is based on, and that is sporting performance. It presents the effectiveness of the implementation of specific activities that are carried out in effort to solve the movement task, defined by competition rules, where an athlete tries to maximize his performance potential [21].

Karate as a form of martial arts and combat sport

Currently, there are three basic forms of karate known: the original Okinawan karate which is associated with Japanese styles and their particularities. Another form is strictly sports karate bounded by rules that go through their development and stabilized when sports karate became an Olympic sport (Tokyo 2020). The last form is “karate-dō”, which extends the concept of “budo” and the principle of continuous self-improvement according to J. Kan and G. Funakoshi [2], [3]. Traditional karate is one of the oldest and most complex martial arts. It was created by combining Chinese boxing and the art of fighting of old masters from

Okinawa Island. Their connection formed – okinawa-te [11]. With the gradual spread of Karate karate-dōto Europe, its didactic side expanded to include the Western concept of physical culture. European body culture emphasizes the strengthening and stretching of muscles and tendons, maximizing the range of movement, eliminating muscular imbalances and proper body posture. This tendency is based on the historical context of Old Greek gymnastics, which has become typical for Western physical culture [7]. With the arrival of East karate, it was especially necessary to reduce the preparatory stage, which was very demanding and lengthy for a European-style karatist. This caused many adepts not to practice this art for a long time. The starting point was the acquisition of the principles of Sanchin kata (form), which combines demanding physical as well as mental preparation. The problem was also the lack of awareness and understanding of the nature of the principles of karate and systems that develop body and mind contained therein [14]. To understand the achieved skill level of skill better, Jigorō (the founder of modern judo) introduced a kyū/dan system. “Kyū” represents a student stage and “dan” a master stage. The scale originally contained 6 kyū of color-coded by white, brown, and black belt (dan). When Funakoshi started to teach karate in Japan, he introduced a system of technical grades with “gi” as well. At Okinawa, degrees were adopted after the World War II, and the expansion of karate to Europe added additional degrees and colour markings to belts [4]. Karate became a modern sport only when martial arts were assigned rules and the organization of opponents’ meetings, where victory or defeat was decided by the amount of the score awarded by the panel of referees on the basis of the established criteria [1]. The first rules were formed for a free contest of two contestants (kumite), followed by the criteria for deciding in kata. Based on the concept of sports karate, which we understand as a comprehensive system dealing with physical exercises, combat physical activity, and activities that lead to overcoming an opponent using strength, skill, courage, or gaining superiority over him, we must state that karate has combat movement contents. The term – combat sports comes from Euro-American (Western) culture and brings together all martial arts that have a competition component, or are defined by competition rules and set criteria for decision making and awarding points [25]. From this conception, we understand combat sport as an artificially created sport that comes from martial arts and forms the part of it that is customized and bounded by rules. In practice, the term “traditional karate” for martial arts is used and “sport karate” refers to its competitive form. We believe that setting the competition rules was the beginning of defining the differentiation between martial arts and karate combat sport, thus different training for both directions was defined. The spirit of martial arts is gradually disappearing and the specialization in sports performance predominates in terms of achieving a higher score, with the opponent still being able to continue the fight (not being physically eliminated). Thus the factors of real struggle, when success and efficiency decide on survival, are largely elimi-

nated which is reflected mainly in the mental aspect of the performer. Achieving a score in accordance with the criteria represents the maximum control of an offensive technique which, if used in a real fight, would eliminate the effects. Preparing for competitive meetings requires long-term systematic work which should be comprehensive, with increasing specialization, depending on the type of competition discipline and the biological, psychological or technical maturity of an athlete.

Characteristics of Sports Training in Karate

We understand sports training as a specialized and managed pedagogical process, based on scientific bases for the purpose of improving an athlete's performance and giving maximum sporting performance to the competition [21]. The athletic high performance represents the combined result in an activity of psychological, attitudinal, biological, and psycho-social factors [17]. Training in sports karate is categorized similarly to other sports in stages and components of sports training and is based on the structure of sports performance. The division into stages ensures the complex development of an individual in all aspects of the changing ratio of general and special sports training. Conditioning, technical, tactical and psychological components form the parts on which sports performance is built as a whole.

Psycho-Physiological Aspects of Sports Performance in Karate

The psychology of sport deals with the study of the interaction between sport and the psyche of man. It examines how sport affects mental processes and personality and, on the one hand, how the course of sport activities is influenced by the psyche of man [20]. Martial arts psychology examines how the martial arts training process affects man as a bio-psycho-socio-spiritual being in the biodromal dimension (life path) [25].

In both of the applied disciplines, the common denominator is a man and his personality. In karate, we encounter a direct confrontation with opponents, expressed by the desire to dominate the competition, by aggressive fighting, by the attempt to win supremacy over others, but also an attitudinal tendency towards oneself, expressed by the spirit of combat and permanent desire for self-improvement [12]. When we focus on sports performance in karate, which has its defined structure for individual competition disciplines, psychological factors are part of a range of performance factors. With regard to the subgroup of psychological factors such as pre-start, start and start states, we cannot measure their values directly, so we use indirect methods of their manifestations that we monitor

through physiological indicators that we can quantify. Key characteristics of personality are found in psychology through standardized methods. Subsequently, we are given the opportunity to observe differences in physiological manifestations among athletes with different categorical characteristics of personality. Personality is characterized by the very characteristics we consider to be its constant behaviour [9]. We can say that there are four factors influencing the way we react in given situations: genetics, past experience, the nature of the situation in which we are and free will. From the point of view of the structure of personality, there are several profiling factors where authors often disagree, but we also find similarities and consensus, therefore from the point of view of the impact on sports performance, the basic psychological structures of personality are the motivational structure of personality, skills, character and temperament [26]. Sport immediately involves competitiveness, which induces anxiety that is characterized by increased excitability. Excitability such as mental or physical activation can result in anxiety (annoying state of high excitement – nervousness, fear) [9]. Another important term is stress, understood as a process in which an individual perceives threat to which he responds through various psychological and physiological changes that involve increased excitement. One reason why we are not able to knowingly regulate our level of excitement is that we do not have a direct indicator of its state. Its manifestations include biological feedback parameters that we can follow. Based on the measurement results, we can then deliberately act on its correction [10]. In addition to enhancing muscle tone, such manifestations include various vegetative responses, the consequences of which are close to the physical load [30]. The main features are increased pulse rate, increased respiratory rate, blood circulation to the skin and redness, increased production of sweat glands, or excretion of adrenaline into the blood [16]. In many sports, there is a very small difference between the level of individual abilities or skills among the best competitors. Therefore, it is often the ability to handle the excitement and stress that is what divides the winner and the loser [24]. An important aspect of personality in terms of nervous regulation is temperament. It can be characterized as an innate tendency to certain emotional responses and to learning, which are the basis for the emotional responses observed throughout life [5]. Individual differences modify the sensory processing and unconscious reactions. A specific characteristic of temperament is emotionality, which is influenced by the stressful and attractive program of sport. A performance-enhancing training program can also increase the activation level. We distinguish three levels of activation – excessively elevated, where the athlete is heavily energized and unable to focus on sports performance. It manifests itself by increased physiological activity of organism and psychological aspects of lack of concentration, loss of attention, communication disorders. Furthermore, there is an excessively reduced level of activation (where the physiological activity of the organism is increased again, but the psychological processes are opposite – the individual becomes ap-

athetic). Optimal level of activation (combat readiness) is an ideal situation where psycho-physiological processes are at such level that an athlete is able to perform the sporting performance that corresponds to his sports training [13]. Thus, a significant dependence of sport performance in karate also comes from psychological factors including emotional stability, concentration of attention, stress, frustration tolerance, temperament, anxiety, internal tension, aggression and activation level. Fear is a substantial emotion that can have a direct impact on sports performance, especially among younger athletes. These aspects are dealt with in the psychological component of sports training, but all physical activities are of psychomotor character. Their realization leads to an increase in physical ability and at the same time we can observe the manifestations of emotion and character traits of the personality, while these manifestations are observable mainly in body posture, muscle tone and in the level of coordination. In the context of sporting activity, emotions with their energizing and mobilizing effects correspond to the broad concept of activation. However, they are seen as a background or accompanying phenomenon of psychological phenomena in performance-oriented sporting activities [26]. It has been shown that after a week's absence from training, holders of high technical grades in karate (1st, 2nd kyu, 1st dan) have significantly increased anger, depression, tension and general mood disturbances [19].

We believe that the physical conditionality realized within the fitness training component, which involves the development of motor skills and forms the basis for the development of skills together with technical training is of key importance in building sporting performance. Motor factors form a complex of performance potential that we develop through planned and structured sports training. The advantage is that we can indirectly detect the level of motor skills through motor tests.

By means of regular diagnostics, it is possible to evaluate the level of changes in the monitored abilities after the application of intervention programs and methods, to look for the most effective possibilities how to achieve the greatest progress. In practice, we encounter a number of training methods looking for the highest efficiency development skills simulating competitive conditions. The advantage of modelled situations and such training units is that in their long-term application, athletes adapt to the situations they encounter in a competitive environment. In this way we can prevent possible negative psychological effects on sports performance.

Psychological Means of Personality Development and Motivation in Sports Karate

When applying methods and means for influencing psychological processes, it is recommended to perform an initial psychodiagnostics to identify selected personality traits and then recommend a regulatory method. Such diagnosis is

generally carried out in a collaboration with a sports psychologist or another expert in the field. It should be noted that the manifestations of change are noticeable in the long-term application of specific methods. To reduce psychological stress, audio-visual stimulation technology can be effectively utilized by psychowalk-man, where it is proven that audio-visual stimulation allows sensual and physical performance to be stimulated for some time and reduce pre-start stress. The energizing and meditation programs help to achieve the activation before the sports performance. Concentration programs provide concentration enhancement. After performance, stimulation by the device is a part of regeneration. Biological feedback can be monitored through heart rate and sleep length [16]. Attention can also be stimulated and extended through the Brainfeedback method, where the probands follow the visual stimuli projected on the monitor and try to change their course through the frequency of the brain waves as directed by a therapist. Their efforts at the level of brain activity are recorded and accompanied by the device's sound. Information is scanned by electrodes on the principle of EEG from the scalp, being recorded, and at the same time used as an immediate feedback for the proband on his brain activity in a particular situation. Such sessions, combined with karate training, can help increase longer concentration and concentration of attention [23]. At the local level, the objective positive impact of psychomotor activities on the regulation of emotional survival has been demonstrated and, secondarily, on the effective management of the negative impacts of pre-start states in combat sports judo and karate [24]. In our opinion, it is really convenient to include different forms of mental training in the training process to enrich it. What is important is the area of concentration on which other components such as preparedness for performance, escalation of self-confidence and determination, and the effort to eliminate disturbances in the administration of performance depend. One of our preferred methods is ideomotor training in which the realization of particular motion structures realized at actual performance is realized. The ideomotor effect is based on the assumption that certain cells of the cerebral cortex can be activated not only by movement, but also by its idea, or even verbal description and instructions of a trainer. The activity of these cells is transferred to the motor areas of the brain and from there to muscles where micro-movements occur. We use motion visualization to assist motor learning in order to achieve the maximum possible performance of an athlete. Another important element is motivation. It decides how a person will behave and the outcome of his actions [6]. Motivation can be understood as a process based on the initial state in which a certain deficit occurs in the individual's physical or social being. To overcome this deficit, some kind of satisfaction is needed. We describe this deficit as a need, and behaviour as an instrumental activity that mediates the relationship between need and satisfaction. The theme then expresses the content of its satisfaction [15]. The power motive plays a major role in the performance motivation process. It represents a tendency in which past

experience is extensively applied. Unconscious processes are also applied in the power motive. It can also be understood as a desire to deliver quality performance, coupled with a desire for recognition. It manifests itself in the approach to fulfilling tasks as an attempt to achieve success [26]. Psychological stability of an athlete is characterized by the ability to face external influences, such as collecting an opponent's strike, processing a referee's verdict, but also differentiating influences that have an impact on the racer's emotional stability but are not directly related to sport. Long-term observation of victory and loss behaviours verifies the means of achieving greater psychological stability. Immediate communication with a trainer, analysis and solution before the start states becomes inevitable. However, the basis of mental stability is belief in one's own forces, backed up by intense training [12]. In sports training in karate we observe a very important role of a trainer not only as a guide and coordinator of the training activity but also his influence on a mental aspect of the individual. His endeavour to shape the character qualities of the mentee and instil the principles of fair play and other psychological aspects based on modern martial arts. From the point of view of long-term cooperation and mutual interaction during the transition of individual stages of training and increasing individualization in preparation, a trainer becomes a person close to an athlete who suddenly gains an overview of the psychological conditions that may have a hidden impact on the sports performance itself. Scientific studies and the field of investigation of psychological manifestations of personality make it possible to choose specific procedures how to work with athletes showing common personality traits (e.g. temperament). However, each person is an individual, and with increasing performance (motor or sports) leading to top sport, there are various psychological manifestations within the framework of training or competition. That is why it is necessary for a coach to combine a wide range of knowledge not only of the field of sport or martial arts, but also to actively and effectively respond to psychological manifestations of a mentee and to prove by its effect potentially negative impacts of psychological conditions on performance.

Conclusion

Based on our training practice and knowledge acquired from a comprehensive analysis of the conclusions of several authors dealing with the issue, we can state that the training process in sports karate is comprehensively focused on the versatile development of an athlete. In long-term sports training, the proportion of specialized training is increasing in effort to achieve maximum sports performance. From the point of view of psychological preparation, its difficulty and importance increases depending on the "significance" and the character of the competition. Its main task is to get a racer to be able to show his performance

potential in full. We must not forget that every athlete is an individual and requires a distinctive approach, especially in the field of psychological training. From the content of the paper and in the context of the studied literature, we have noticed that training in sports karate is, as a rule, focused on sports performance, but we are inclined to believe that the principles of traditional karate need to be implemented in sports training. In this way, it is possible to build up the perception of karate not only as a sport but also as a way of life and thus to achieve a different dimension of perception of competitive conditions in an athlete. The answer to the question of what kind of conditionality, whether psychological or physical, is more effective in terms of sporting training can be ambiguous: the physical conditionality realized through the fitness and technical component of sports training clearly determines (limits) sports performance, respectively the level of skills and skills achieved by this training. According to the research of Taylor and Beassard [27], Zemková [28], [29], Grmanová and Slizik [8], Štefanovský [26], motor factors belong to limiting factors in sports performance in combat sports, including karate and have a major impact on it. The authors acknowledge the effect of psychological factors on performance, but they do not explicitly define their impact. Psychological processes are highly individual, therefore psychological preparation cannot be broadly generalized. By means of psychomotor activities and realization of model situations in the training process, the effects of negative impacts can be eliminated and thus the performance can be positively influenced. However, the sign of long-term sport preparation is the complexity and therefore the realization of psychological preparation from the entry of an athlete into the training process. The rate and effectiveness of resources in psychological preparation depends on individual characteristics of an athlete's personality and manifests after long-term exposure. From the perspective of long-term success in competitive clashes and sporting performance, karate performer has to therefore pay equal attention to psychological factors such as conditioning, technical or tactical training.

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