" METHOD OF JUMPING ABILITY DEVELOPMENT FOR PERFORMING THE NOPIO AP CHAGA KICK IN ATHLETES AGED 14-17 YEARS SPECIALIZING IN TAEKWONDO ITF"

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Moscow-2025

INTRODUCTION

Relevance. Every year the interest in sports increases and more and more children come to different sports sections. For teenagers, various martial arts and martial arts become the most attractive, as they offer the opportunity to start practicing and achieve results at any age.

Taekwondo ITF is a Korean martial art that stands out among other types of martial arts for its entertainment and dynamism. Athletes in taekwondo ITF can realize themselves in various disciplines and every year the level of competition in all disciplines increases significantly. Especially among juniors aged 14-17. In this regard, the importance of high-quality, comprehensive preparation of athletes for competitions increases, taking into account their individual characteristics.

One of the distinctive features of taekwondo is high kicks in jumps. This technique not only looks spectacular from the outside, but also proves its effectiveness in practice, as it allows you to reach the target located at a height. Jumping kicks are widely used in ITF taekwondo and are used for a variety of purposes and disciplines. The taekwondo section of the ITF "special technique" specializes precisely in such punches and assumes the presence of not only good stretching and a set technique of blows, but also a high level of jumping ability from athletes. For successful training of athletes in this discipline, it is necessary to properly develop physical qualities, especially during the period of active physical growth, which is typical for the age under consideration-14-17 years.

In the period of 14-17 years, active physical development of the body takes place. Muscles, ligaments and the bone system develop and rebuild. All these facts impose certain features on the training process, but it is at the age of 14-17 years that you can most successfully improve jumping ability. Changes in the muscular system of the body in athletes aged 14-17 years create the basis for the development of explosive leg strength – a key component of jumping ability. In addition, the development of jumping ability has a positive impact on the development of physical qualities of athletes: coordination, flexibility and speed. Therefore, developed jumping ability contributes to better control of your body.

Most athletes, when performing jumps, often face various injuries due to insufficiently strengthened calf muscles, achilles tendon, kneeligaments (cruciate and collateral), as well as ankle and hamstring ligaments. The development of jumping ability requires concomitant strengthening of the above-mentioned muscles, which subsequently reduces the risk of injury when performing difficult coordination strikes.

When performing kicks in jumps, in particular the nopio ap chaga kick, which is included in the competition program in the "special technique" section of taekwondo ITF, flexibility is a key element and ensures the most effective kick, as it allows the athlete not only to exert maximum effort at the moment of pushing off, but also due to this, to achieve maximum impact. the required height for direct execution of the kick.

From this we can conclude that the study of methods of jumping ability development in taekwondo athletes aged 14-17 years is relevant both from a theoretical and practical point of view, since this study is aimed at improving the training process and improving competitive results. Thanks to high-quality training, athletes will be able to significantly improve their skills and achieve high results.

The object of research is the physical training of athletes aged 14-17 years, specializing in taekwondo of the ITF.

The subject of the study is the physical training of athletes aged 14-17 years, which contributes to the development of jumping ability when performing the "nopio ap chagi" stroke.

The aim of the study: to develop a training method aimed at developing the jumping ability of athletes aged 14-17 years specializing in taekwondo and ITF.

The hypothesis of the study is that the developed method is more effective than the traditional approach to training for the development of jumping ability when hitting "nopio ap chagi" in athletes aged 14-17 years, specializing in taekwondo ITF.

The practical significance of the study is that further use of the developed technique for developing jumping ability when performing the "nopio ap chagi" stroke for athletes aged 14-17 years specializing in taekwondo of the ITF can be effective.

Based on this goal, the following research objectives can be formulated :

Research objectives:

1. Study of scientific and methodological literature devoted to the development of jumping ability and improvement of the "nopio ap chagi"stroke;
2. Determine the level of jumping ability of athletes aged 14-17 years engaged in taekwondo ITF;
3. To develop and experimentally evaluate the effectiveness of a training technique aimed at developing the level of jumping ability in athletes aged 14-17 years.

CHAPTER 1. THEORETICAL ASPECTS OF JUMPING ABILITY DEVELOPMENT IN TAEKWONDO ITF

1.1 Jumping ability: definition, characteristics, meaning in sportse

Jumping ability is an important component of motor activity of athletes in any sport. In this regard, the effective development of this quality cannot take place separately from other physical qualities. Developed jumping ability in athletes is also characterized by concomitant qualities that allow the athlete to perform complex coordination actions.

In the process of developing sports and conducting various studies, the semantic content of "jumping" was constantly refined. The first Russian authors, Kotov B. A. and Lyubimov A., did not disclose the concept of this term. The first attempt to characterize jumping was made by V. S. Klimenko in 1939. He discovered jumping ability as a combination of strength and proper coordination of all efforts when pushing off. One of the most common and generally accepted concepts of jumping ability in the modern literature is considered to be the ability to perform a jump with a high lifting height of the total center of mass of the body or with a significant range without running.

First of all, the height of the position of the general center of gravity of the body is determined by the optimal combination of vertical and horizontal departure speeds. The most difficult phase in this case will be the moment of repulsion. In addition, the height of the jump largely depends on the athlete's ability to develop efforts as quickly as possible. The movement of the hands creates an initial impulse that provides a certain speed of movement, and contributes to the manifestation of explosive force.

If we consider the jump by the nature of muscle activity, then it should be attributed to the speed-strength group, since speed-strength abilities provide rapid movement of the body and its links in space. Speed-power abilities are a type of power qualities of a person and characterize his ability to show strength at different speeds of

movement. Jumping ability also depends on the power developed during repulsion and, accordingly, requires concentration of volitional efforts, which, in turn, is associated with the level of explosive strength of the athlete.

The concept of explosive force refers to the ability of a person to exert the greatest power in the shortest possible time. This quality is evident in exercises, that require performing the highest or longest jump possible. The explosive nature of the movement is ensured by the efforts made, carried out in the shortest possible time, when performing tasks. Kalashnikov Yu. B. considering the development of speed and strength abilities in his works, he notes that the development of explosive leg strength affects the height and speed of the jump, which makes it possible to perform more effective kicks in jumps.

It is important to highlight the overall value of speed of movement, which is an important component of jumping ability. The high functional ability of the nerve centers allows you to quickly change the state of the muscles from contraction to relaxation, thereby providing the previously described explosive force and better coordination of movement. Therefore, a faster change of muscle work contributes to an increase in the repulsive force, due to the possibility of applying maximum effort in the shortest possible time.

For the manifestation of jumping ability, the accuracy of the applied efforts will be of great importance at a high speed of performing jumps. This ratio is provided by the rhythm, which is not the same in different movements. There are four main phases in performing a nopio ap chaga kick: run-up, kick-off, kick-off, and landing. The optimal rhythm when performing a nopio ap chaga stroke involves a smooth accumulation of energy in the flexor muscles (iliopsoas, rectus femoris, sartorial muscle), followed by an explosive transition to extension. Consequently, a violation of the rhythm in any of the listed phases of the stroke leads to inefficiency and inconsistency of motor actions. Thus, jumping is a skill, that belongs to the speed and strength abilities and includes three main components: explosive strength, speed and rhythm of movements.

Jumping ability is largely determined by coordination abilities, such as mastering the rhythm of running and pushing, as well as movements in the flight phase – all this requires high agility indicators. Coordination abilities are understood as the ability to effectively coordinate movements (coordinate, co-ordinate into a single whole) when constructing and reproducing new motor actions. Coordination abilities have pronounced age characteristics, and considering the age of 14-17 years, we can distinguish 2 stages of coordination development. In the period of 14-15 years, there is a decrease in coordination of movements, and at the age of 16-17 years, coordination of movements reaches the level of an adult. Based on this, it can be argued that athletes can successfully develop jumping ability in the period of 14-17 years.

The abovee facts confirm the close relationship of jumping ability with all the physical qualities of a person, such as strength, flexibility, speed and coordination. It is worth considering the importance of flexibility in the development of jumpingability, as it allows athletes to effectively perform body movements during the flight phase. A necessary condition for performing a jump and, accordingly, a high level of jumping ability is a large range of movements of various parts of the body. Mobility and elasticity of the joints are ensuredby the presence of good flexibility in the athlete. A large range of motion makes it possible to use more muscle fibers to perform a high jump. Returning to such a component of jumping as explosive force, it is worth clarifying that it is flexibility that allows the athlete to make a more effective and rapid change of relaxation and tension phases in the muscles.

The definition of jumpiness can also be formulated as the ability to perform high jumps, using the explosive strength of the muscles. This quality is of great importance for athletes in various sports and, as mentioned earlier, especially for taekwondo and ITF.

Each sport has its own characteristics of the use of jumping ability and determining its meaning, taking into account the specifics of the sport – the role of jumping ability in taekwondo ITF will be analyzed in part 1.3 of the first chapter.

However, it is possible to distinguish the general value of jumping ability for athletes of any sport.

Due to the fact that the quality of "jumping ability" is interrelated with other aspects of an athlete's physical fitness and has a significant impact on them то, jumping ability can be identified as a key component of an athlete's physical fitness.

Various kinds of injuries are quite common in any sport. One of the most common is sprains of ligaments and muscles. This type of injury occurs when the muscles and ligaments are not sufficiently strengthened. If we talk about jumping, then the most susceptible to injury is the moment of pushing off and landing. In addition to the lower extremities of the human leg and ankle, the leg muscles are also involved in performing the jump – the calf muscles and thigh muscles, as well as the knee joints. The musculature of the back and abdominal press, which are related to stabilizer muscles, also make it possible to perform jumps more efficiently. The heavy load that is placed on the joints and muscles during the jump increases the risk of injury. Strengthening all the above-mentioned muscles is of great importance not only as a way to effectively develop jumping ability, butalso as a way to prevent the risk of injury when performing complex coordination actions.

Given the relationship of jumping ability with coordination and flexibilityю in a person – it can be argued, that a well-developed jumping ability contributes to better control of your body. This gives more importance to jumping ability as a quality that an athlete must have for high results in sports, and the ability to control his body, not on a hard surface, and perform clear actions in the flight phase increases the effectiveness of the actions themselves.

Thus, developed jumping ability determines the success of performing jumping and speed-power actions,since it belongs to the group of speed-power abilities and is determined by a number of terms, including both the optimal departure angle and the speed of swing actions. This, in turn, places increased demands on the rhythm of reproduced motor actions. Without achieving the necessary consistency of the movements of all parts of the body in each phase of the jump, its effective performance is excluded.

Coordination, speed, flexibility and explosive power are components of jumping ability, with appropriate development of which the development of jumping ability is ensured.

1.2 Features of the nopio ap chaga stroke technique in taekwondo ITF

As mentioned earlier, taekwondo ITF is distinguished by a wide variety of kicks in jumping and the most advanced kick technique. Each stroke has its own technical features of execution. In this part of the final qualification work, the technique of performing the nopio ap chaga kick will be considered, in which the development of jumping skills is considered.

Nopio ap chaghi is a straight jump kick. This kick is included in the competition program in the "special technique" section of taekwondo ITF, and is also often demonstrated at demonstration performances.

The main components of the nopio ap chaga stroke should be highlighted:

- Run-up;
- Repulsion;
- Impact;
- Landing.

The run-up performed before the kick is an important component of the nopio ap chaga kick, as it allows the athlete to gain the necessary speed before the moment of push-off. The run-up itself is performed in a straight line and can include any number of steps (the optimal and most common one is a 4 – step run-up). The pace of the run-up is also important, which is not the same at different steps. By the last steps, the athlete must have gained the highest speed in comparison with the first steps, which will allow him to make a furtheree powerful upward push.

Repulsion is an important component of the impact from the point of view of creating the necessary momentum. The applied pulse provides explosive force. The torso must remain upright so that the next jump is made as high as possible. In addition, the vertical position of the body and, accordingly, the correct repulsion, prevents loss of

balance and allows you to more accurately make a further blow. Simultaneous swing of both hands during the push-off promotes high flight and proper coordination of movements in the flight phase. In the context of jumping, the push-off stage is key, since the push-off itself is the basis of jumping and jumping, respectively. Developed jumping ability allows you to perform a push-off before hitting quickly and powerfully.

After the athlete pushes off from the floor surface and flies up, the next phase occurs, which is essentially the main one – the execution of the kick. Nopio ap chagi is a kick, performed with a mismatch. Due to the swing leg, the athlete directs his body upwards, and the push leg initially provides an impulse for the jump. In the flight phase, the athlete implements a different leg: the push leg changes the swing leg with a sharp movement and makes a direct kick, while the swing leg retains a bent position to maintain balance. The kick must be performed in the flight phase, at the highest point. An important aspect is the foot-the impact is made by the pad of the fingers. The kicking leg bends and falls down after performing a kick with an active movement.

Bending your legs at the knees when landing helps to absorb the impact and maintain balance. For stabilization – the torso should be slightly tilted forward. Loss of balance or falling on landing indicates a lack of coordination of movements during the jump, which means a loss of control of the body, and from this it is possible to detect the presence of a low level of coordination.

To create an effective training program for better preparation for competitions, the competitive aspects of the nopio ap chaga stroke will be considered .

As a target, a board is used on a special machine for special equipment, which is located at the highest height compared to other strikes. Consequently, it is difficult for most athletes to make an effective and effective impact on boardse, located at a height of 2.1–2.2 meters for girls and 2.6–2.7 meters for boys, only due to good stretchingy. In addition to the correct stroke technique, hitting the board provides a high jump, which is due to the developed jumping ability of athletes.

Performing a nopio ap chaga kick also requires athletes to have a high level of coordination. Since when performing a jump kick, the athlete is in a non-supporting position for a certain amount of time, and the main movement (kick) is performed in the flight phase, which in turn requires the need to control the balance and coordinate their movement. It is with the help of balance that it will be possible to implement a coordinated interaction between all parts of the body.

Summing up the features of the nopio ap chaga kick technique, we conclude that in a competitive program, the kick has the highest board height and, therefore, requires a high level of jumping ability in athletes to perform an effective kick. Nopio ap chagi includes four components, the coordinated implementation of which ensures a successful strike.

1.3 The role of jumping ability in kicking in Taekwondo ITF

Taekwondo ITF is distinguished by its versatility and diversity of disciplines. Athletes can successfully implement themselves in five disciplines: technical complexes (tul), massogi, special equipment, power breaking, staged sparring (self-defense).

In taekwondo, kicking takes up about 70% of the total technique, which is why it is the most important component of this type of martial arts. The striking technique of the legs in taekwondo ITF can be described as the" hallmark" of the Korean martial art. In combination with the jumping technique, kicking allows for more effective execution of punches. Considering competitive activities, each of the five taekwondo disciplines of the ITF has a jumping technique of kicking. Thus, the role of jumping ability when performing kicks is very large, in particular, developed jumping ability allows athletes to successfully realize themselves in various disciplines of taekwondo and ITF.

Jumping kicks are most characteristic of ITF taekwondo and, as a rule, this sport is associated with jumping kicks. Often, to attack an opponent or a target, plocated at a high altitude, it is not enough to have a good stretch for a high and accurate blow. In this case, you should perform a jump kick, which will add height to the impact.

In ITF taekwondo, more points are awarded for kicks performed in the jump in the "massogi" discipline, but for this it is necessary to have time to implement the kick, being separated from the floor. Depending on the difficulty, such strikes bring from two to five points. Well-developed jumping ability allows athletes to perform jumps as high and accurately cas possible and coordinate their actions to deliver a successful blow.

Referring to the rules of competitions in the ITF taekwondo sport, starting from the age of 14, athletes are required to implement "test kick" in each round of the massogi competition discipline — this is a kick in a jump with a 180°-degree turn or more. The introduction of this rule significantly changed both the training of athletes, and the arsenal of actions used in the competitive discipline "massogi". The level of skill of athletes has increased and complex combinations of kicks in jumping have become more and more used in duels. This brings up-to-date the topic of jump ability development, taking into account the above rationale. To perform a scoring action, the athlete must have a high level of jumping ability, since the kick is a complex coordination action that can be performed not only in a jump, buto also in combination with a turn. Consequently, the technique of scoring a kick in "massogi" requires athletes to have developed jumping ability, which also includes a coordination component.

If we consider the role of jumping ability in the performance of technical complexes, it is impossible not to say about its advantages, which are given by a developed jumping ability to an athlete, who fills the top. Of course, fluidity affects the quality of jumps performed. Technical complexes include complex jumping techniques of kicks, such as Timio Yopcha chirugi, timio pande dollio chagi. In addition to kicking while jumping, technical complexes also include other defensive and attacking actions, performed while jumping. Developed jumping ability makes it possible for an athlete to perform a kick technically correctly, and not lose balance when landing. Since jumping ability is inextricably linked to the explosive strength of the muscles, this allows the athlete not only to perform jumping elements well, but also to make sharp and strong kicks, while standing on a hard surface.

An applied discipline in taekwondo ITF is staged sparring (self-defense). In it, athletes demonstrate the use of various techniques for self-defense. In the competition program, the athletes must demonstrate mandatory elements, including a jump kick, double or triple jump kick, and a two-way jump kick. In the successful implementation of these techniques, a key role is played by jumping, ability, which allows athletes to push off from the floor as high as possible and coordinate their movements, while in flight to implement a false kick technique.

The most characteristic discipline of taekwondo ITF as a manifestation of jumping is a special technique. Special technique is a section, in which athletes must perform jump kicks of varying difficulty at a set height. Developing jumping ability, which is one of the most important things in special equipment, athletes develop not only the ability to jump high, buto also not to lose control of their body while in the flight phase. Speed, which is a component of jumping ability, makes it possible to develop the speed of various movements. In the absence of forces, provides the ability to make the maximum effort in the shortest possible time. Thus, jumping ability contributes to the implementation of effective strikes at high altitude, with the help of powerful repulsion, the speed of movement of various parts of the body, the ability to coordinate their actions in the flight phase, and also maintain balance when landing.

It is generally accepted to distinguish two types of jumping ability: general and special. General jump ability implies the ability to perform simple jumps up or long. Special jumping ability is the ability to develop a high repulsion rate. For kicks in taekwondo ITF, it is important to have special jumping ability in athletes. Special jumping ability provides athletes with the opportunity to apply maximum force in the shortest possible time when pushing off due to the speed of contraction of muscle fibers, and thus make a high jump for further impact.

Thus, fluidity is of great importance in the execution of kicks. The kicking technique is used in every discipline of Taekwondo ITF. Developed jumping ability allows athletes to effectively use kicks in jumps in sparring, in particular, to perform

mandatory scoring actions, to demonstrate the technique of performing kicks without losing balance when landing and with good coordination of their movements in the air.

1.4 Physiological features of development of athletes aged 14-17 years

Sports are always distinguished by the presence of a high level of competition, and at the present stage, a significant increase in the physical capabilities of athletes is noticeable. In this regard, for high sports achievements and maintaining competitiveness, it is necessary to maintain the quality of the training process. An effective training system is impossible without taking into account the age, as well as the physical and psychological characteristics of athletes ' development.

The age of 14-17 years refers to the high school age. One of the distinguishing characteristics of this age period is the completion of puberty, as well as the continuation of growth and development of the body as a whole. In this regard, the process of physiological development proceeds relatively calmly and evenly in individual systems.

Let's take a closer look at the features of each of the body's systems in the age period of 14-17 years, and also study the recommendations for training based on the presented physiological features of the development of athletes at the age under consideration.

The musculoskeletal system is very susceptible to changes. During the period of 14-17 years, ossification of most of the skeleton is gradually completed. The area of the spine, pterygoid and extremities is particularly characterized by such development. In this regard, the spine becomes stronger, but the chest is still developing. For the complex motor actions under consideration, this is an important aspect. But despite this, the organism of an athlete at this age allows you to transfer heavy physical loads to these parts. Adolescents have more joint mobility and muscle elasticity than adults, but this is no longer the case and have more elasticity, which is typical for children.

This age period is characterized by differences in body size and shape. Young men surpass girls in height and body weight. The muscle mass of athletes aged 14-17 years

increases. This is due to the growth of the diameter of muscle fibers. In boys, muscle mass is about 44% of the total body weight, and in girls-31%. In the muscles of the lower extremities, compared with other parts of the body, the greatest increase in muscle mass is observed.

By the age of 17, the volume of the heart increases, and the blood supply to the muscle and the body as a whole gradually improves. However, it is worth considering that the adaptive capabilities of the circulatory system are still limited and not fully formed, so you should carefully approach intensive training.

The respiratory system has its own characteristics in athletes aged 14-17 years. The vital capacity of the lungs in boys reaches 2600 ml, and in girls 2500 ml. Under these conditions, the endurance of athletes improves. Increased aerobic endurance – this means, that athletes are able to perform various series of exercises, in particular, jumping without significant loss of power. During physical exertion, the frequency and depth of breathing increases, which ensures a greater supply of oxygen to the muscles. There is also faster recovery between approaches due to efficient gas exchange.

Turning to physical qualities and their development in athletes aged 14-17, we will pay special attention to aspects related to the development of the considered skill-jumping ability, as well as related physical qualities – flexibility, coordination, speed and strength.

The development of the bone apparatus entails the formation of muscles and tendons, with mating. In adolescents, muscle development occurs fairly evenly and quickly, gradually and muscle mass grows, and therefore strength develops. During the period of 15-16 years, physical training of athletes should be aimed at developing such qualities as speed, strength and bone-strength qualities. Since age characteristics are most conducive to the improvement of these qualities. Speaking of muscle development, it should be noted that higher growth rates are characteristic of the muscles of the lower extremities, which in turn entails favorable opportunities for the development of

explosive leg strength. Good opportunities for direct development of muscle strength are already evident at the age of 14-15 years.

One of the leading roles in the manifestation of muscle strength is played by the activity of the central nervous system. The central nervous system is responsible for coordination of movements. During the period of 14-17 years, there is an improvement in the interaction between motor and sensory systems, thereby providing better control over various movements. Significantly improves the ability to respond quickly and coordinate movements. Considering this aspect in the context of the topic of the final qualification work, it should be noted that the nopio ap chagi stroke requires a high level of coordination of movements from athletes. Thus, the age of 14-17 years is the most favorable for studying and developing complex coordinated movements.

Psychological features. Athletes at this age in most cases have high self-esteem and strive to achieve high sports results. However, there is a sensitivity to criticism. In this regard, external motivation is important for athletes – the support of the coach and praise. During adolescence, "competitive motivation" is clearly expressed, so athletes often strive for self-affirmation through sports achievements. At the age of 14-17 years, emotional ability is also observed, which in turn can affect the concentration and performance of athletes.

Given the differences in the rate of biological development, it is important for athletes aged 14-17 to approach the training process correctly and in a balanced way. It is necessary to select loads for each athlete individually.

About yourself, you should pay attention to the development of the muscles that are involved in performing jumps (discussed in detail in part 1.1 of the final qualification work), in which the age of 14-17 years is the most favorable for the development of this quality and with the correct construction of the training process that takes into account the physiological characteristics of athletes, you can significantly improve the level of jumping ability. Adolescence is a suitable period for learning and improving complex coordination actions and strokes, due to the development of the central nervous system.