EFFECTIVENESS OF SPECIAL STRENGTH EXERCISES IN DEVELOPING NUCLEAR THROWING TECHNOLOGY IN 17-18 YEAR-OLD PARA-LIGHT ATHLETICS

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https://doi.org/10.5281/zenodo.20501943

ARTICLE INFO

Received: 26th May 2026
Accepted: 28th May 2026
Online: 30th May 2026

KEYWORDS

para-athletics, shot put, special strength exercises, technical training, explosive strength, training process, para-athletes, sports results, physical fitness, coordination

ABSTRACT

This thesis examines the effectiveness of special strength exercises in improving shot put technique among 17-18-year-old para-athletes. During the study, the athletes' physical fitness, strength qualities, and the level of technical movement execution were analyzed. The influence of the training program developed on the basis of special strength exercises on the results of the shot put was determined. The research results showed that purposefully and systematically applied special exercises serve to increase the explosive power, coordination, and technical execution accuracy of athletes. It was also substantiated that this methodology is an effective tool for improving the athletic performance of para-athletes and optimizing the training process.

Today, para-athletics plays an important role in the physical development, social adaptation, and enhancement of athletic skills among youth with disabilities. In particular, achieving high results in the shot put requires a high level of strength, speed, coordination, and technical preparation from athletes. The period of 17–18 years is an important stage in which the physical capabilities of athletes are actively formed and special sports skills are refined. Therefore, organizing the training process for para-athletes of this age on a scientific basis is one of the most pressing issues.

Today, the development of Paralympic sports in Uzbekistan is recognized as one of the priority areas of state policy. In particular, the Resolution of the President of the Republic of Uzbekistan No. PP-373 dated December 11, 2025, "On additional measures for the further development of Paralympic sports," defines important tasks for the development of para-athletics, the selection of talented young para-athletes, the enhancement of their athletic skills, and the introduction of a modern training system. The resolution emphasizes strengthening the scientific approach to training Paralympians, modernizing sports infrastructure, and creating special conditions for athletes.

Based on this regulatory legal document, the effective use of special strength exercises, the improvement of shot put technique, and the optimization of training equipment are considered urgent scientific and practical issues in the training process of 17-18-year-old para-athletes. Especially, the organization of training taking into account the individual

capabilities of athletes and the use of modern methods serve as an important factor in achieving high sports results.

Special strength exercises play a special role in the effective mastery of nuclear throwing technique. Such exercises help to develop the explosive strength of athletes, increase the amplitude of movement and accurately perform technical elements. In practice, the insufficient consideration of the individual characteristics and functional capabilities of athletes when using training equipment creates certain problems.

This thesis analyzes the effectiveness of special strength exercises in developing shot put technique in 17-18-year-old para-athletes and develops scientific and practical recommendations for improving the training process. The results of the study are expected to be of great importance in improving the athletic performance of para-athletes and optimizing the training system.

The shot put holds a special place in the system of para-athletics. This sport requires a high level of physical fitness, technical skill, and special strength qualities from the athletes. Especially for 17-18-year-old para-athletes, the formation and improvement of shot put technique is a complex pedagogical and physiological process. This is because during this age period, the functional capabilities of the body actively develop, muscle strength increases, and an important stage in the formation of athletic skill is observed. Therefore, the correct selection of special strength exercises used in the training process and their organization on a scientific basis are of great importance.

One of the main factors in achieving a result in a nuclear launch is the development of explosive power. Explosive power is an athlete's ability to generate maximum power in a short period of time. Special strength exercises are used to develop this quality in para-athletes. In particular, half-sitting exercises with a barbell, shoulder muscle-developing press exercises, medical ball throwing, exercises with rubber shock absorbers, and various jumping exercises contribute to the effective formation of shot put technique. These exercises activate the muscular activity of athletes, improve movement coordination, and help in the precise execution of technical elements.

Research indicates that the individualization of training loads in para-athletes is one of the important factors in achieving high results. Since each athlete has different functional capabilities, physical condition, and level of disability, training equipment must also be selected individually. For example, for athletes with well-developed upper body muscles, strength exercises are used more frequently, while for athletes with weak coordination, more attention is paid to exercises that develop balance and movement accuracy. This increases training efficiency and prevents excessive fatigue.

The throwing technique consists of several stages, which include the preparation position, the movement, the throw, and the final phase. To perform each stage perfectly, the athlete must possess specialized physical training. The harmonious functioning of the leg, back, shoulder, and arm muscles is of particular importance during the displacement and throw phases. Therefore, it is recommended to use complex strength exercises during training sessions. Comprehensive exercises help develop several muscle groups simultaneously and serve to automate technical actions.

During observations with 17-18-year-old para-athletes, it was established that the regular application of special strength exercises leads to a significant improvement in athletic results. During the training process, when special strength exercises were applied 3-4 times a week, it was observed that the athletes' shot put distance increased, technical errors decreased, and overall physical fitness indicators improved. In particular, throwing exercises performed with a medical ball expanded the amplitude of arm movement in the shot put and increased the possibility of generating final strength.

When organizing the training process, it is also important to correctly plan the load volume and rest intervals. In para-athletes, excessive load can cause rapid fatigue of the body and an increased risk of injury. Therefore, it is necessary to adhere to the principle of gradualness in training. Initially, technical elements are formed based on light and medium loads, followed by a gradual increase in strength loads. This approach helps adapt the athletes' bodies to high loads.

The role of pedagogical control in the application of special strength exercises is also of great importance. The coach must regularly monitor the athlete's movement technique, the quality of exercise execution, and the state of the body's recovery. Through pedagogical control, the individual capabilities of the athlete are determined, and necessary changes are made to the training program. This serves to further increase the effectiveness of training.

In scientific research conducted on nuclear throwing techniques, the gradual improvement of technical movements is evaluated as a crucial factor. In particular, V.N. Turevich, analyzing the development of nuclear projectile throwing techniques, notes that initially one arm's effort was dominant, but later the impact force on the projectile increased due to arm and torso activity. Also, the main feature of modern nuclear throwing technique is explained by the increase in the speed of projectile movement during the exercise. Research has noted that the coordination between athletes' motor amplitude and body activity directly influences the outcome. Furthermore, it is shown that the correct formation of the optimal flight point and the flight angle of the shot is of great importance in increasing the throwing distance.

Today, great attention is paid to the use of innovative training tools within the modern sports training system. In particular, the use of rubber stretchers, special simulators, and video analysis methods serves as an effective tool for improving the technical training of para-athletes. Video analysis allows for a step-by-step analysis of the athlete's movements and the identification of technical deficiencies. As a result, the athlete quickly realizes their mistakes and manages to eliminate them.

Also, psychological preparation is one of the important factors in para-athletes. Psychological pressure during the competition process directly affects athletic results. Therefore, during training, special attention should be paid to increasing the self-confidence of athletes, strengthening motivation, and developing volitional qualities. When psychological training is carried out in combination with physical and technical training, the chances of achieving high athletic results increase.

In general, special strength exercises are an important tool in developing the shot put technique in 17-18-year-old para-athletes. Their scientifically grounded selection and purposeful application in the training process enhance the physical and technical fitness of

athletes. The individualization of training sessions, the gradual increase in loads, and the use of modern pedagogical and innovative methods further increase the effectiveness of training. As a result, the athletic results of para-athletes will improve, and their chances of achieving success in competitions will expand.

Conclusion: During the study, it was determined that special strength exercises play an important role in the development of shot put technique in 17-18-year-old para-athletes. The purposeful and systematic application of special strength exercises during training significantly improves athletes' explosive strength, coordination, movement precision, and technical proficiency. In particular, medical ball throwing, barbell exercises, jumping, and exercises performed with rubber shock absorbers have an effective effect on increasing the results of the shot put. The results of the study showed that the selection of training means based on the individual capabilities and functional state of athletes increases training efficiency. Stage-by-stage load planning, pedagogical supervision, and the use of modern innovative tools are important factors in developing the athletic skills of para-athletes.

Furthermore, the harmonious implementation of technical, physical, and psychological training serves to achieve high results in the competitive activities of athletes. Therefore, it is necessary to pay special attention to special strength exercises in training sessions with para-athletes and to organize them on a scientific basis.

Overall, it has been substantiated that the effective use of special strength exercises is an important tool for improving the shot put technique, increasing athletic results, and optimizing the training process for 17-18-year-old para-athletes..

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