

Specific Features of the General Physical Fitness of Athletes with Disabilities

L. V. Byankina¹, A. V. Khotimchenko², V. V. Byankin³, I. M. Vorotilkina⁴, M. M. Prokopyeva⁵

¹Far Eastern State Academy of Physical Culture, Russian Federation, 680028, Khabarovsk, Amursky Boulevard, 1.

²Pacific National University, Russian Federation, 680035, Khabarovsk, Tihoockeanskaya St., 136.

³Far Eastern State Transport University, Russian Federation, 680021, Khabarovsk, Seryisheva St., 47.

⁴Sholom-Aleichem Priamursky State University, Russian Federation, 679015, Birobidzhan, Shirokaya St., 70a.

⁵Federal Autonomous Institution of Higher Professional Education "The North-Eastern Federal University named after M.K. Ammosov", Russian Federation, 677000, Yakutsk, Belinskogo St., 58.

Abstract

Sports are an effective method of rehabilitation for persons with disabilities of different nosological groups. The following facts illustrate the world trend of the Paralympic Movement development: 390 athletes from 22 countries participated in the 1964 Summer Paralympics in Tokyo, Japan, and 4,350 athletes from 176 countries participated in 2016 Summer Paralympics in Rio de Janeiro, Brazil, the biggest sports event in the entire history of the Paralympic Movement. The competition in most sports has increased. At the same time, in Russia, in spite of all our athletes' achievements, adapted sports are still developing. The topic of our research is general physical fitness of athletes with disabilities as it serves not only the purpose of competing at sports events and achieving sports results but also the purpose of strengthening the body of a person with disabilities and including such persons in the society. Thus, general physical fitness also serves the purpose of inclusive education. The article contains the discussion of certain problems of inclusive education and the specific features of the general physical fitness of athletes with disabilities (illustrated by the example of persons with mobility-related disabilities who are engaged in powerlifting). The article also presents the analysis of such athletes' physical fitness results over three years.

Keywords: general physical fitness, athletes, persons with mobility-related disabilities, inclusive education, adapted powerlifting.

INTRODUCTION

The Federal Law No. 273-FZ dated 12/29/2012 "On Education in the Russian Federation" has fundamentally changed the approach to access to education for physically impaired persons and persons with disabilities by declaring "provision of equal access to education for all students taking into account the variety of special educational needs and individual capacities" [1, Art.1]. Article 79 stipulates that professional educational institutions and higher education institutions must create special conditions for students with disabilities receiving education.

The law describes two groups of people for whom special conditions should be organized: students with disabilities and physically impaired students. The status of these groups is confirmed by different commissions – a psychological, medical and pedagogical commission in the first case, and the medical, social and expert commission in the second case. The status of a physically impaired person by itself does not grant a person the right to be considered a person with disability as such right must be confirmed by the psychological, medical and pedagogical commission. Thus, the law does away with the ambiguity of the term "a student with disabilities" and this category becomes more understandable and, consequently, more widely used within the context of the education system. At the same time, in the adapted sports the following terms are used: a physically impaired person, a person with disabilities, a person with mobility-related disabilities, a person with physical health problems, etc. [2, 3, 4, 5, 6, 7]. In the classification of adapted sports, there are certain problems [2, 8] related to referring athletes to various nosological groups.

Martynova [9] separates the following factors of disadaptation of persons with disabilities: disabilities, psychological disadaptation, social disadaptation, information disadaptation, and cognitive disadaptation. Chebarykova believes that the concepts of "dysontogenesis" and "disease" intercross and the presence of congenital developmental pathology or developmental pathology acquired at an early stage do not always become the grounds for declaring a person not healthy. Thus, disadaptation and dysontogenesis are simply a field of work for specialists and persons themselves who have the status of not healthy, or physically impaired, or a person with disabilities [10]. This means that the problems of persons with developmental pathologies

adapting to the society are considered together with the issues of identification (that is, identifying oneself with a social role of a physically impaired person). The theory is based on the idea that the individual reaction to oneself is predetermined socially, that such reaction is dependent on the interconnection between the developmental pathology and social stereotypes.

Different people having relatively similar disabilities (physical health problems) experience their condition in different ways. "The attitude of a person having special needs towards the existing anomaly and towards themselves as its carriers is also various" [11, p.75]. The author, when studying the internal picture of a defect, distinguishes the following types of this internal picture: hypercompensating, nosophile, manipulative, harmonious, and denying. Presenting detailed characteristics and providing specific examples of the distinguished types, Chebarykova analyzes the factors that influence the formation of the internal picture of a defect. According to Chebarykova, the group of external factors includes the influence of various levels of the social environment, and the group of internal factors includes the characteristics that cover various sides of a personality: self-conception, values-based orientations, motivational sphere, characteristic features, and communicative competency [11]. The results of the study carried out by Chebarykova confirm that the types having the biggest amount of problems regarding the social and psychological adaptation prevail. As the study was carried out at a higher educational institution, we believe it possible to assume that the obtained data will be the same for other educational institutions for this age group. The harmonious and the denying types can be considered the most "secure", yet, as regards the issue of obtaining knowledge and skills in physical training and sports, we believe that all types will exhibit additional specific features. Thus, in particular, the hypercompensating type, being oriented towards achieving the highest possible results in all spheres of life including the most challenging ones, may achieve certain results in adapted sports, and such specific features of his/her social adaptation as the feeling of superiority and dislike towards those "more lucky from birth" [11, p. 76] will be alleviated. Yet special, more profound studies need to be conducted in order to make more serious conclusions.

Taking into account the specific nature of the Far Eastern region of Russia, the peculiarities of implementing inclusive education will manifest themselves in the following: low population density provides for, on the one hand, relatively small (compared to the Western part of the Russian Federation) number of persons with disabilities, while on the other hand, for (relatively) small amount of special institutions for correction and adaptation. Consequently, skilled specialists lack niche specialization, and only the differentiated approach is implemented. Another consequence of this will be vocational counseling and further employment of alumni. That is, at the level of higher educational institutions' specific features, the regional features will be expanding functions of an educational institution regarding vocational counseling and further employment of alumni with disabilities. It is natural that in these conditions specialists of various educational institutions should unite their efforts.

The distinguishing features of a physical training institute/university include mastering practical disciplines of physical training and sports (such as volleyball, basketball, track and field sports, ski sports, and other kinds of sports). Inclusive processes in this area are quite difficult as one has to understand the specific nature of movement to master methodological recommendations. Naturally, these specific features are understood in adapted sports where all athletes are in equal conditions (having similar disabilities). However, creating such teams by various kinds of sports and holding competitions is also difficult due to the above considerations. Therefore, it is natural that it is recommended to applicants with disabilities to apply to such courses as Physical Training for Persons with Physical Health Problems (Adapted Physical Training) where the specific features of their health are taken into account. Thus, inclusive education processes within the physical training education have just started, and their success will depend on various factors, including the physical state of physically impaired persons, which can also be corrected, and the main method of correction is engaging in physical training and sports.

MATERIALS AND METHODS

As a result of many years of work, we have selected exercises that can be performed by persons with mobility-related disabilities. Depending on the disability type, the set of exercises and the initial position for a certain athlete are selected individually, but the main preparatory exercises are very similar. The first to be performed are exercises for back and abdominal muscles. The sequence of exercises is also important. Below are exercises that are performed according to a specific sequence during the first stages of preparation [12]. As a rule, athletes can choose to perform one or two exercises from each group.

Main exercises for abdominal muscles: raising torso on a slant board (the angle to be selected individually), leg raises on a slant board (the angle to be selected individually), "compression" – kneeling at pulldown (these exercises can be performed by persons with any disability), forearm-supported hanging leg raises on parallel bars, right and left body bending in a standing or seated position with small weight in hands, body turning in a standing or seated position with a metal bar on shoulders. The last two exercises are recommended for people with cerebral palsy.

Exercises for back muscles: for upper back muscles – wide-grip lat pulldown in a seated position, close-grip cable seated row, for lower back muscles – back extension. People with lower-limb amputations do not perform back extension.

Exercises for chest muscles: dumbbell flies in a lying position, bent arm extensions/curls using butterfly machine, and dumbbell bench press. Dumbbell flies in a lying position are interchanged with dumbbell bench press – at one training session, one exercise is performed, and in another session – the other exercise.

Exercises for shoulder muscles: bending arms with weights (biceps) in a seated position with back chair support (the back chair angle is selected individually), bending arms with barbell in a standing position (or in a lying position in case of a spinal injury), arm extensions with barbell behind the neck (triceps) in a seated position, close-grip lat pulldown, bent-over arm extension with dumbbell with bench support, dumbbell bench press seating on a bench at a 70 degree angle, close-grip cable standing row to the chin level (selectively).

Exercises for leg muscles for people with cerebral palsy: leg curls in a lying position on a groove machine (for anterior and posterior thigh muscles), leg extension in a seated position in a groove machine, raising weight on toes in a seated position (weight is put on a thigh and is selected individually).

At the end of a class, hanging exercises are performed.

People with lower-limb amputations who do not use prosthetic devices perform all exercises in a seated or lying position. Legs can be fixed, depending on the degree of amputation.

The level of general physical fitness is first tested only after a year of training, regardless of the type of disability. The test exercises are the following: arm extensions/arm curls in front leaning support (floor, bench), pull-ups, body bending on a slant board and, individually, arm extensions/arm curls on parallel bars. Starting from the second year of training, special physical fitness tests are added to the general physical fitness tests. Both types of tests are carried out once a year. In our research, we used six exercises as tests for athletes with mobility-related disabilities: arm extensions/arm curls on parallel bars, arm extensions/arm curls in front leaning support, pull-ups, back extension, raising torso on a slant board, and elbow hanging leg raises. When analyzing the test sections of programs for training persons with disabilities, the following feature can be noted. Depending on the kind, test exercises in one sport can include general physical fitness tests, and in another sport, they can be aimed at testing special physical fitness [5, 13].

RESULTS AND DISCUSSION

Training athletes in various kinds of adapted sports is carried out based on best practices of training athletes without disabilities [3, 4, 6, 14]. The basics of organizing and implementing the training process for powerlifters with mobility-related disabilities are taken from the same process for powerlifters without disabilities, as well as from the training process for bench press athletes. However, these methods are compiled without taking into account the type of disability or the specific features of the exercise performance technique in adapted powerlifting, that is, without taking into account the capabilities of athletes themselves.

Training an athlete with mobility-related disabilities in powerlifting covers various types of training. According to the Federal Standard of Physical Training by a Kind of Sports of Persons with Mobility-Related Disabilities, the program must include the following types of training: general physical fitness, special physical fitness, technical, tactical, psychological, theoretical, and integral training, sports competitions, and remedial measures.

If we analyze the percentage ratio in which the volumes of types of training are distributed, we can note that, depending on the training stage, the hours shift from one type of training to another. At the initial stage, the biggest amount of hours is dedicated to general physical fitness – 48-52%, and then at each subsequent stage this amount is reduced. At the training stage, the amount of hours dedicated to the general physical fitness is twice as small – 20-24%. At the athletic perfection stage, the amount of hours for this type of training is reduced by 3 times – 15-19%. We believe that it is reasonable to provide the maximum amount of hours for general physical fitness for persons with mobility-related disabilities at the preparatory and initial training stages, as it is at

the beginning of sports career that the foundation (basis) for further training is created. At these stages, the focus is on developing all physical qualities, which in future has an effect on the level of training of the cardiovascular and respiratory systems and the strength endurance.

"Training an athlete from the general pedagogical position, the system-ordered process of athlete training is a long-term process of applied and specialized education and training" [15]. Matveev states that during the whole evolution of sports among the methods and means of athlete training the preparatory exercises are the main and specific.

The main specific features of the general physical fitness of powerlifters with mobility-related disabilities include a special individual selection of exercises performed in the initial position, which is possible for these athletes. The exercises are selected so as to minimize the load on the spinal column, without athletes standing in a vertical position, but with support on the back of a chair; sometimes athletes with severe spinal traumas perform these exercises in a lying position. Performing various exercises is limited for athletes with mobility-related disabilities who can perform only those available to them and in a certain initial position. In order to facilitate and ensure the possibility to perform exercises by such athletes, coaches and adapted physical training specialists develop various aids and appliances that are used in the training process [14, 16].

Many authors provide classification of sports training means [2, 15, 17, 18]. Means are that which serves to solve the training tasks. Vinogradov divided all training means into four groups: pedagogical, psychological, medico-biological, and additional. Pedagogical means include physical exercises, training methods, planning training sessions, arranging a training session, verbal means, nonverbal means glances, facial expressions, and gestures). Psychological means include conversations, lectures, reflection, discussions, heterotraining, autotraining, induced sleep and relaxation, and neuropharmacology. Medicobiological means include pharmacology, massage, self-massage, banya, sauna, water procedures, ultrasonic and light irradiation, and electrical procedures. Additional means are physical labour, material stimulation, and behavior of fans, hygiene, material and technical comforts, regime of life, genetic engineering, sexual relations, astrology, mysticism, and natural forces.

The pedagogical means are the main of all the variety of training means. The training session tasks are solved using physical exercises (motor actions). All physical exercises are divided into three groups: competitive, special training, and general training [19].

In adapted powerlifting, all the main physical exercises used in the training process are related to a competitive exercise – bench pressing and are special training exercises. They include close-grip, medium-grip, and wide-grip bench presses, bench-pressing on inclined bench (at different angles, head-up and head-down, also with different grips), underhand-grip bench-pressing, bench-pressing with various range of movement (1/3 or 2/3 of the main range), bench-pressing in yielding mode, bench-pressing pause fixation with barbell on chest, bench-pressing from bars of various height (4, 8, 10 and 12 cm), bench-pressing with a foam roller under waist, bench-pressing with stopping at various points, bench-pressing with rubber straps, bench-pressing with chains on the barbell (chains facilitate the bar movement); hanging arm extensions/curls on parallel bars. The last exercise (arm extensions/curls) is deliberately included in the special exercises as we believe that this exercise is the main exercise for developing triceps, which is responsible for arm extension. Other specialists believe that this exercise should be included in the general training group.

The third group of exercises is the biggest and includes various exercises that contribute to a powerlifter's development. General

training bench-pressing exercises can be performed both with sole weight, groove machines, free weights (barbell, dumbbells, or kettlebells), rubber cables or straps, or high-bars, and using various assistive devices. In adapted powerlifting, exercises are selected taking into account the athlete's capabilities. The initial position to perform this or that exercise is selected on an individual basis. Here are several exercises from this group: trunk bending/extension on a slant board (the angle to be selected individually), back extension (hyperextension), on an individual basis, arm extensions/curls in a seated position from behind, arm extensions/curls in front leaning support (at different angles), wide-grip pulldown behind the neck, French bench press, dumbbell press in a seated position, dumbbell flies in a lying position, arm pulling with dumbbells forward and sideward in a seated position, hangs on bars, etc.

CONCLUSIONS

The results of the conducted research allow making the following conclusions. The large-scale implementation of inclusive education is possible only with the sufficient level of physical training of persons with disabilities. The adapted physical training and sports include methods aimed at not only strengthening the physical health of a physically impaired person, but also at achieving sports results by such a person. If those are implemented more widely, it will be possible to significantly improve the condition of physically impaired persons.

The current regulations of adapted powerlifting competitions allow people with disabilities of different nosological groups compete in the same category. However, to a certain extent, the degree of disability defines the final result of sports activity, and coaches can from the very beginning foresee the sporting level of their trainees and orientate them towards a certain level of achievements. These circumstances allow concluding that, besides the methods of training young athletes in youth athletic centers, there must be methods for training adults with disabilities (both with congenital and acquired traumas), all the more so as in powerlifting strength is the main physical quality, and the sensitive period of strength development is the adult age.

General physical training exercises for persons with mobility-related disabilities are used during the whole training process, regardless of the training stage. The lower the athlete's physical training level, the more time should be dedicated to developing required physical qualities. Abdominal and back exercises are performed at each training session, regardless of the type of disability and the athlete's skill. The higher the athlete's physical training level is, the fewer general physical training exercises in one session are used. Exercises are selected on an individual basis, depending on the type and degree of disability and the athlete's capabilities.

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