

**SISTEM OBUKE SPORTISTA SA
INVALIDITETOM U
SPORTOVIMA SNAGE**

**THE TRAINING SYSTEM OF
ATHLETES WITH DISABILITIES
IN STRENGTH SPORTS**

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SAŽETAK

Analiza naučne i metodološke literature pokazuje fragmentarnu prirodu dostupnih informacija o pitanjima sistema obuke sportista sa invaliditetom u sportovima snage. Danas se posmatra mehanički prenos neadekvatnih naučnih i metodoloških pristupa pripremi sportista u olimpijskom sportu do adaptivnog sporta. Cilj istraživanja je da se identifikuju specifičnosti sastavljanja sistema treninga za sportiste sa invaliditetom u sportovima snage. U istraživanju su uključeni treneri (n = 54) koji rade na snazi u sportu. Upitnik je proveden u otvorenom obliku na osnovu 15 regionalnih centara fizičke kulture i sporta za invalide "Invasport". Na osnovu analize rezultata upitnika razvijena je teorijska struktura dugoročne višegodišnje pripreme sportista sa invaliditetom u sportovima snage. Pored toga, utvrđeni su preporučeni kvantitativni pokazatelji konkurentnih aktivnosti sportista u sportovima snage. Utvrđeno je da struktura dugoročne višegodišnje pripreme treba da sadrži pet faza, čije trajanje zavisi od nivoa ostalih motoričkih sposobnosti sportista. Otkrivena je neophodnost korekcije pristupa za sastavljanje sistema obuke za sportiste sa invaliditetom u sportovima snage na osnovu prilagođavanja odgovarajućih pristupa opšte teorije osobnosti treninga sportista sa invaliditetom.

Ključne reči: *dugoročna višegodišnja priprema, struktura, adaptivni sportovi*

INTRODUCTION

The effectiveness of training system of people with disabilities in strength sports is determined by a number of factors. Important among them are the correctness of approaches to scientific and methodological support of their preparation, taking into account the level of saved motor abilities and peculiarities of motor activity (Bolach & Prystupa, 2014; DePauw, & Gavron, 1995; Winnick & Porretta, 2017).

Modern scientific research on training of athletes with disabilities in strength sports is based on scientific and methodological works devoted to certain aspects of training athletes with musculoskeletal system damage in powerlifting as a Paralympic kind of sports (Prystupa, Stefaniak & Rudenko, 2017). In particular, the authors have investigated the impact of powerlifting on the body of athletes with disabilities (Biankina & Khomichenko, 2015), historical aspects of powerlifting development for people with disabilities (Stecenko, 2013), improvement of physical, technical and mental fitness of athletes with disabilities in musculoskeletal system (Prystupa, Stefaniak & Rudenko, 2017) and consideration of nosological features of strength lifters with disabilities in musculoskeletal system in the training process (Ilmatov, 2015). The problem of training athletes of other nosological groups in powerlifting and arm-wrestling was studied by authors in terms of identifying the effectiveness of arm-wrestling for the socialization of people with disabilities (Kharitonashvili, Comaia & Budzishvili, 2007) and powerlifting for improving physical fitness of athletes with visual impairment (Gromov, 2006).

The fragmentary nature of the available scientific research makes it impossible to operate an effective scientific and methodological support for the training of athletes with disabilities in strength sports. Therefore, in the practice of sports, the training of athletes with disabilities is predominantly characterized by a mechanical transfer of approaches of general theory of athletes' training to the training of athletes with disabilities in strength sports (Fishe, McNelis, Gorgey, Dolbow & Goetz, 2015; Prystupa, Stefaniak & Rudenko, 2017). It may lead to reduction of sport longevity and possibility of realizing sports potential of people with disabilities in the process of achieving the maximum possible result (Sakakibara, Shin, Watanabe, & Matsuoka, 2014; Gee, West, & Krassioukov, 2015; Chatzilelecas, Filipović, & Petrinović, 2015; Fidler, Schmidt & Vauhnik 2017).

An analysis of the scientific and methodological base of adaptive sport points to a number of problems. In particular, the system of training athletes with disabilities is not adapted to the regularities of the development of sports skills in strength sports and the specifics of their saved motor abilities. Thus, the formation of scientific knowledge about the structure and content of multi-year preparation of athletes with disabilities in strength sports is becoming relevant.

The aim of research is to identify the peculiarities of composing a training system for athletes with disabilities in strength sports.

METHODS

The following methods were used in this research: bibliographic study of theoretical-conceptual, methodological and practical outlines presented in specialized scientific-methodical literature; study of documentary materials; method of inquiry, questionnaire; expert evaluation methods; method of mathematical statistics. In preparing the research we used conceptual approaches to working out scientific research questionnaires in physical education and sports (Ashmarin, 1978).

In the research were invited 54 coaches, among them: the Honored Coaches of Ukraine (n = 13), coaches of the highest category (n = 10), coaches of the first category (n = 16), coaches of the second category (n = 10), coaches without category (n = 5). It had been continuing from September 2017 to December 2017. Among the respondents, 31 coaches

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work in Regional Centers of Physical Culture and Sports for the Disabled "Invasport" and 23 coaches work on a voluntary basis with athletes with disabilities. The average work experience of respondents in the field of strength sports for the disabled was $9,44 \pm 6,01$ years, and their average age – $39,49 \pm 9,54$ years. All respondents gave permission to disclose information about their participation in the research.

The questionnaire included section on demographic information about respondents (age, work experience, qualifications, kind of sport) and the main part, which included 8 open-ended questions, 3 questions regarding the ranking of response criteria and 2 close-ended questions. Open-ended questions related to the definition of quantitative indices on different issues of training system for athletes with disabilities in strength sports (number of training sessions, number of hours in one microcycle, number of competitions, percentage ratios of different types of training).

The arithmetic mean (\bar{X}) and the standard deviation (σ) were calculated to determine the average demographic information of the respondents and the answers to questions, where numbers were involved. There was calculated Kendall's coefficient of concordance (W) for the questions that provided the answer in the form of indices ranking for significance. The purpose of this was to evaluate the extent of the agreement among raters in relation to the ranking of response criteria. The statistical processing of the research materials was conducted using the Microsoft Excel 2010 software package and the Statistica 6.0 software.

RESULTS

The analysis of respondents' answers to the question about the methodological basis for composing training system of athletes with disabilities shows that 81,48% of respondents use syllabus for healthy athletes in their practice. At the same time, 90,74% of respondents indicated that while training athletes with disabilities, they primarily guided by their own experience, because there are no training programs of athletes with disabilities in strength sports. Only 44,44% of respondents are familiar with foreign programs for people with disabilities.

According to expert's opinion in the field of strength sports for the disabled (96,29% of respondents), the structure of long-term multiannual preparation of athletes with disabilities should differ from those accepted in the general theory of training of athletes. Among responses 98,14% consider that the length of stages of training system depends on the level of remained motor abilities of athletes.

Results of answers on the question allowed us to form the theoretical model of long-term multiannual preparation of athletes with disabilities in strength sports, which includes five main stages shown in Figure 1.

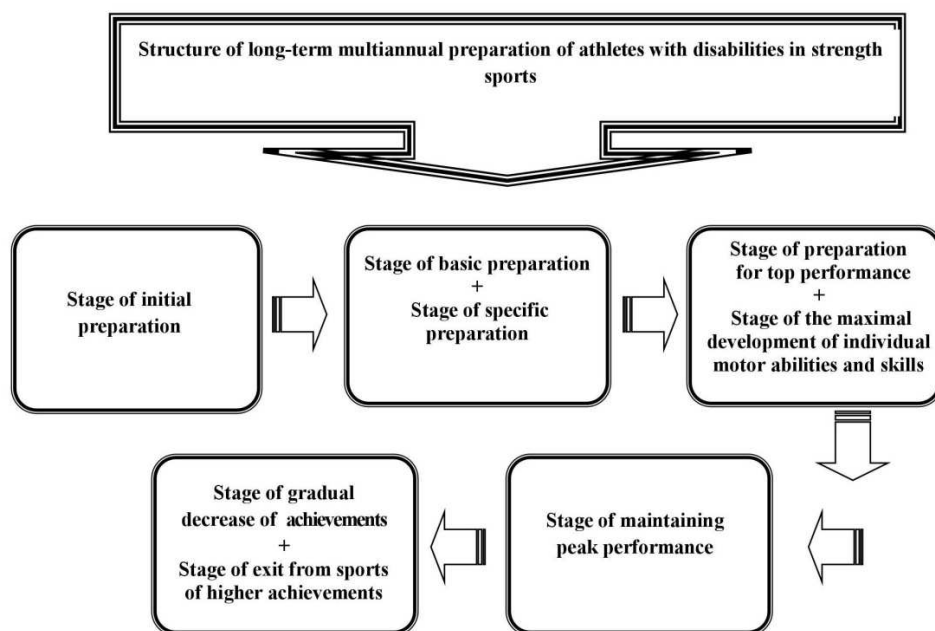


Figure 1. Theoretical model of the structure of long-term multiannual preparation of athletes with disabilities in strength sports.

In the structure of long-term multiannual preparation of athletes with disabilities in strength sports, it is necessary to single out the stages of initial preparation (100, 00% of respondents) and stages of maintaining peak performance (98,15% of respondents). Percentage indices about the allocation of other stages in the structure of long-term multiannual preparation for athletes with disabilities were less than the statistical majority.

Respondents indicated the need to combine some of the stages in different ways. According to 70,37% of respondents, in the structure of long-term multiannual preparation of athletes in strength sports there is a need for scientific and methodological substantiation of a new stage of preparation. The purpose and tasks of it will be deciding the declared goal and tasks of the stage of gradual decrease of achievements and exit from sports of higher achievements. In opinion of 55,56% respondents the stages of basic preparation and specific preparation need to be combined into a single stage in long-term multiannual preparation of athletes with disabilities. At the same time 53,70% of respondents believe that the stages of preparation for top performance and the maximal development of individual motor abilities and skills need to be reformatted into a single stage, which will solve the common tasks of preparation of both stages.

Respondents also determined the quantitative indices of competitive and training activities of athletes with disabilities of different qualifications in strength sports, which are described in Table 1.

Table 1. Recommended quantitative indices of competitive and training activities of athletes with disabilities of different qualifications in strength sports

Qualification of athletes	Number of competitions in annual training cycle		Number of training sessions in a weekly microcycle		Number of hours of training sessions in a weekly microcycle	
	X	σ	X	σ	X	σ
Junior grades	2,41	$\pm 0,69$	3,28	$\pm 0,76$	7,07	$\pm 1,71$
III sporting grade	3,17	$\pm 0,67$	4,20	$\pm 0,74$	8,41	$\pm 1,46$
II sporting grade	3,98	$\pm 0,69$	4,76	$\pm 0,85$	11,19	$\pm 2,19$
I sporting grade	4,63	$\pm 0,77$	5,74	$\pm 0,81$	14,54	$\pm 2,62$
Candidate for Master of Sport	5,54	$\pm 0,72$	6,83	$\pm 1,16$	19,26	$\pm 2,67$
Master of Sport	6,46	$\pm 0,70$	8,33	$\pm 1,27$	24,35	$\pm 2,83$
Master of Sport International Class	6,39	$\pm 0,66$	9,82	$\pm 1,84$	27,82	$\pm 2,17$
Merited Master of Sport	5,48	$\pm 0,67$	10,78	$\pm 1,94$	28,65	$\pm 1,88$

Legend: X – average mean; σ - standard deviation.

During the realization of research, we found that, according to the opinions of respondents, the most important criterion is the fulfillment of the requirements for the assignment of sports grades and titles. At the same time, the level of consistency of opinion of respondents in all cases was satisfactory (coefficient of concordance ($W = 0,698-0,764$)).

When determining the significance of the criteria for the transfer of athletes with disabilities from junior grades to the next training group, the first place with a sum of 198 and an average grade of 3,67 (standard deviation, $SD = 0,52$) respondents gave to special transfer tests from the kind of sport. The next criterion of significance is the scales for assessing the motor abilities of athletes with disabilities with a sum of 165 and an average grade of 3,06 ($SD = 0,42$). The criterion for fulfilling the requirements for the assignment of sports grades and titles was ranked third (rank sum was 103, average rank 1,91, $SD = 0,70$). The criterion duration of training of athletes, according to respondents, is the least significant when determining readiness for transfer of athletes with disabilities to the next group of training (the sum of ranks was 64, the average rank 1,19, $SD = 0,40$). The value coefficient of concordance was 0,606, which suggests satisfactory consistency of opinion of respondents.

DISCUSSION

The assumptions concerning the mechanical transfer of approaches of general theory of athletes' training to the training of athletes with disabilities has been confirmed. This statement is found in the works of a number of authors, which studied the characteristics of the training of athletes in adaptive sports (Herasymenko, Mukhin, Pityn & Kozibroda, 2016; Cruz & Blauwet, 2018). The obtained results also confirm the necessity of taking into account the level of remained motor abilities when composing training system of athletes with disabilities, which was declared by other authors (Biankina & Khomichenko, 2015; Prystypa, Stefaniak & Rudenko, 2017).

For the first time was developed a theoretical model of the structure of training system for athletes in adaptive sports. The respondents identified five main stages in the structure of long-term multiannual preparation of athletes with disabilities. Some respondents proposed the allocation of a new stage, which is different from the stages declared in the general theory of training of athletes - a rehabilitation stage. Among of the interviewed coaches 33,33% indicated in the rationale for the structure of long-term multiannual preparation of athletes with disabilities that the modern system of long-term multiannual preparation for this athletes needs the allocation of a rehabilitation stage as a separate structural element. The percentages for the allocation of this stage are lower than the statistical majority. Simultaneously a qualitative analysis of the level of professional qualification of respondents who insist on the allocation of this stage, allow us to put forward some hypothesis. It refers to the need for additional researches on the rehabilitation stage as a separate structural element of long-term multiannual preparation of athletes with disabilities in strength sports. Among the respondents who indicated the need for the rehabilitation stage were 11 Honored Coaches of Ukraine, 3 coaches of the highest category and 4 coaches of the first category. This determines the need to take into account the opinion of these coaches in the process of scientific and methodological substantiation of long-term multiannual preparation. In researches of some authors there are attempts to substantiate this stage as an integral part of the structure of long-term multiannual preparation of athletes with injuries in the musculoskeletal system (Briskin, Evseev & Perederiy, 2010; Biankina & Khomichenko, 2015).

As the result of analysis of respondents' answers, for the first time has defined recommended number of competitions in annual training cycle, in which athletes with disabilities of different qualifications in strength sports should participate. In addition, the available information was supplemented with quantitative indices of training sessions in a weekly microcycle for athletes with disabilities of different qualifications in strength sports. Comparative analysis of the obtained indices number of hours of training sessions in a weekly microcycle for athletes with disabilities and the norms of the weekly regimen of training for people with disabilities in children's and youth sports schools, indicates the need of correction weekly training session norms for athletes with disabilities. Besides, the norms, which were approved by the normative documents of the weekly training work for athletes with disabilities coincide with these norms for healthy athletes. It reflects the negative tendency for the mechanical transfer of organizational and methodological approaches for preparation of athletes in the Olympic sport to the preparation of athletes with disabilities.

One of the results of research, which was found out for the first time, is the definition by respondents the importance of criteria for determining the readiness of athletes with disabilities of different qualifications specializing in strength sports for transfer to the next training group. According to the opinions expressed, the most significant for athletes of the youth grades are special transfer sports tests for the assessment of special preparedness. Equally important are the scales for assessing of remained motor abilities of athletes with disabilities. At the same time, the criterion of fulfilling the requirements for the assignment of sports grades and titles according to the Uniform Sport Classification, which respondents identified as the most significant for skilled and highly skilled athletes with disabilities, was ranked only third in the rankings for athletes of junior grades. As in strength sports, sports result directly depends on the level of remained motor abilities of athletes, athletes with severe forms of lesions cannot fully realize their sporting potential. This suggests the need for using special transfer tests and scales of assessment of saved motor abilities in order to assess the readiness of athletes for transfer to the next training group. And also it is confirming the need for a significant correction of approaches to the training of athletes with disabilities in strength sport.

CONCLUSIONS

It has been established that the structure of long-term multiannual preparation for athletes with disabilities should be different from the structure of long-term multiannual preparation for athletes in the Olympic sport. And also should be adapted to the needs of the practice of strength kinds of adaptive sports.

The theoretical model of structure of long-term multiannual preparation of athletes with disabilities was developed. There were determined recommended quantitative indices of competitive and training activities for athletes with disabilities of different qualifications in strength sports.

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SUMMARY

The analysis of scientific and methodological literature shows the fragmentary nature of the available information on the issues of training system for athletes with disabilities in strength sports. The mechanical transfer of unadapted scientific and methodological approaches to the preparation of athletes in the Olympic sport to adaptive sports is observed today. The aim of the research is to identify the peculiarities of composing a training system for athletes with disabilities in strength sports. We involved coaches (n = 54) working in the field of strength sports in the research. The questionnaire was conducted in an open form on the basis of 15 Regional Centers of Physical Culture and Sports for the Disabled "Invasport". Based on the analysis of questionnaire results, the theoretical structure of long-term multiannual preparation of athletes with disabilities in strength sports was developed. In addition, we have determined the recommended quantitative indices of competitive and training activities for athletes in strength sports. It was established that the structure of long-term multiannual preparation should include five stages, the duration of which depends on the level of remained motor abilities of athletes. The necessity of approaches correction is revealed for composing training system for athletes with disabilities in strength sports on the

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basis of adaptation of the corresponding approaches of general theory to the peculiarities of training athletes with disabilities.

Key words: *long-term multiannual preparation, structure, adaptive sports.*

ПОДГОТОВКА СПОРТСМЕНОВ С ИНВАЛИДНОСТЬЮ В СИЛОВЫХ ВИДАХ СПОРТАХ

РЕЗЮМЕ

Анализ научно-методической литературы свидетельствует о фрагментарном характере имеющегося научного знания по проблематике подготовки спортсменов с инвалидностью в силовых видах спорта. Сегодня наблюдается механическое перенесение неадаптированных научно-методических подходов к подготовке спортсменов в олимпийском спорте в адаптивный спорт. Целью исследования является выявление особенностей построения подготовки спортсменов с инвалидностью в силовых видах спорта. Исследование проводилось с привлечением тренеров ($n = 54$), которые работают в области силовых видов спорта. Анкетирование было проведено в открытой форме на базе 15 региональных центров физической культуры и спорта инвалидов «Инваспорт». На основе анализа полученных результатов разработана теоретическая структура многолетней подготовки спортсменов с инвалидностью в силовых видах спорта, определены рекомендованные количественные показатели соревновательной и тренировочной деятельности спортсменов с инвалидностью в силовых видах спорта. Установлено, что структура многолетней подготовки спортсменов должна включать пять этапов, продолжительность которых зависит от уровня сохранившихся двигательных возможностей спортсменов. Выявлена необходимость в коррекции подходов к построению многолетней подготовки спортсменов с инвалидностью в силовых видах спорта на основе адаптации положений общей теории подготовки спортсменов к специфике подготовки спортсменов с инвалидностью.

Ключевые слова: *многолетняя подготовка, структура, адаптивный спорт.*

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