

An improvement powerlifters' training process with the use of information technology

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Purpose: *improving the training process powerlifters' with use of information technologies.*

Material & Methods: *analysis and generalization of the literary sources and data of the Internet, pedagogical observations and the method of information modeling.*

Results: *computer program "Bench Press" has been developed for the organization and management of the training process.*

Conclusion: *developed an innovative software product that allows you to plan training loads based on the proposed sets of exercises.*

Keywords: *powerlifting, training process, information technology.*

Introduction

Analysis of the literature shows that the researchers used different approaches to improve the training process of athletes [6; 9; 11; 15; 16; 18–22]. Powerlifting is the youngest among athletic sports – weightlifting, bodybuilding, kettlebell lifting. Popularity of powerlifting is explained by the simplicity, accessibility of this sport, rapid growth of results and favorable influence on the health of the athlete. Powerlifting exercises help to increase the level of muscle strength, strengthen the joints, help develop endurance, flexibility and other useful qualities, nurture the will, self-reliance, increase the working capacity of the whole organism. Achievement of high sports results in powerlifting, as in any other sport, is possible only on the condition of systematic training aimed at comprehensive physical development, the formation of strong-willed qualities, the desire for constant improvement in the technique of performing various kinds of exercises. Main task of powerlifting is the development of strength indicators – the ability to raise the maximum weight at one time in three basic exercises [2; 5; 17].

Analysis of scientific literature shows that at the present stage of the powerlifting development, athletes combine in the training process a variety of exercises aimed at developing maximum strength, in particular, plyometric exercises [4; 23].

Increasing the effectiveness of the training process in powerlifting depends on the rational planning of physical activities and the formation of techniques of competitive exercises. A particular problem for coaches is the individualization of the techniques of competitive exercises, but the anthropometric and physiological characteristics of powerlifters, the level of physical readiness, the features of the development of motor qualities and the formation of knowledge and skills. That is why a clear application of physical loads in the rational construction of the training process should be carried out taking

into account the individual features of powerlifters.

Building a program for the physical training of powerlifters requires the analysis of a large number of individual indicators. One of the directions of solving this problem is the use of various computer technologies that help improve the management of the training process and optimize the obtaining of the necessary information [1; 8; 10; 12; 13]. The main arguments in favor of computer learning technologies are individualization, visibility, interactivity, the possibility of using combined forms of information representation and the implementation of independent learning, at the end affects the speed of mastering the material [3; 11; 14]. Given the above, we can assume that the introduction of computer technology is an actual and effective means of improving the training process of powerlifters.

Relationship of research with scientific programs, plans, themes. The research was carried out in accordance with the theme of the scientific research work of the Kharkov State Academy of Physical Culture 1.1 "Scientific and methodological foundations of the use of information technologies for the training of specialists in the field of physical culture and sports", the state registration number 0111U003130.

The purpose of the research: *improving the training process powerlifters' with use of information technologies.*

Research task is to develop a computer program "Bench Press".

Material and Methods of the research

To solve the problems, the following research methods were used: analysis and generalization of the literary sources and data of the Internet network, pedagogical observations and the method of information modeling.

Results of the research and their discussion

1. When drawing up a training program in powerlifting for the development of strength, it is necessary to determine the maximum weight that an athlete can lift in each of the three basic exercises. For athletes, a program of light, medium and heavy workouts, where work is performed with different weights (for example, light workout – work with 50% of the maximum indicators, average – 65%, heavy – 90%).
2. The “Bench Press” program is designed for athletes of powerlifters and coaches. With its help, you can define a set of exercises for training, whose goal is to increase the maximum limit in exercise “Bench press” [7].

Program includes an information block, which lists the main literature on the technique of bench press. Function of generating a training complex, which is an integral part of computer development, will help beginners with the definition of a training program.

One of the functions of the program is the ability to pick up exercises for a certain cycle and teach them how to do it. To solve this problem created animations and descriptions for them, significantly simplify learning and help master the terminology.

Main component of the program is the corresponding record of training. When compiling a training program through recorded training, you can choose the weight, the number of approaches and times, based on the tonnage diagram and the number of bar lifts per workout. With the help of the program it is possible to conveniently monitor the observance of the regularity of variation of the load, which will greatly improve the training cycle and will avoid overtraining of the athlete.

When you start the program, you enter the main window (Figure 1), which contains the “Main Menu” and two lines for writing the login and password. If there is no account, you need to click on the “Register” button, and then the registration window will appear.

In this window you can register an account by selecting your login and password. After logging in to the account, it becomes possible to keep personal records. They will be available in the main menu.

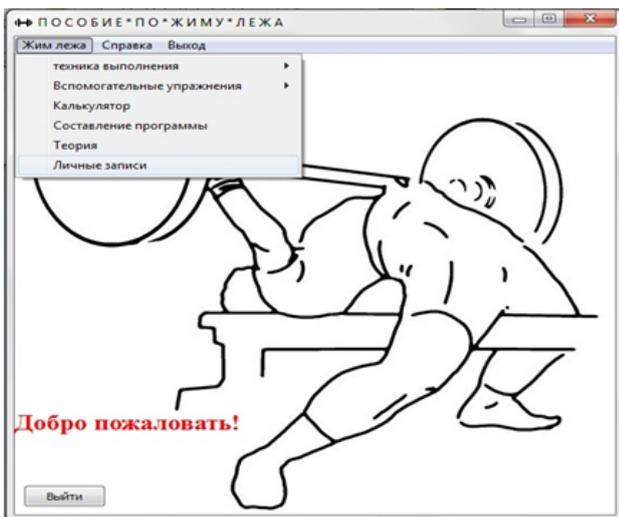


Fig. 1. Main menu of the program

After going to “Personal Records” (Figure 2), a window with four buttons appears. The first button “Training” – adds a template for one training day. It contains: Date, Number of bar lifts, Tonnage and Exercises / approaches are fields for filling.

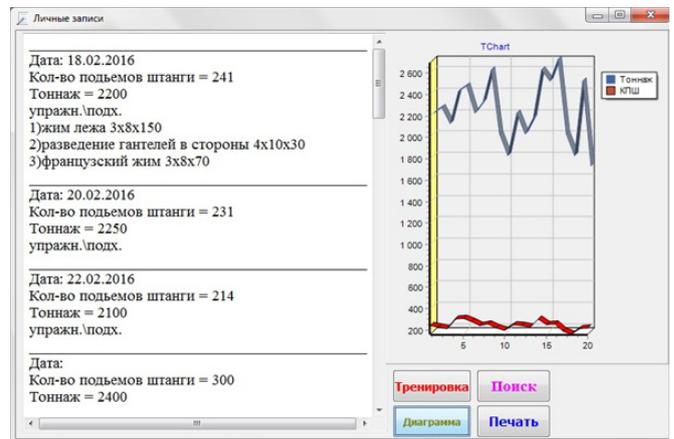


Fig. 2. Personal records

The second button “Search” is designed to make a request. When you click OK, a search is performed among the available workouts.

With the help of the third button “Diagram” you can build a diagram of the number of lifts of the bar and tonnage. It is necessary for the analysis of cycles and the convenience of viewing the performance of training.

When you press the fourth “Print” button, the workout program is output to the printer. In the main menu in the “Technique of performance” tab there are two items (Figure 3).

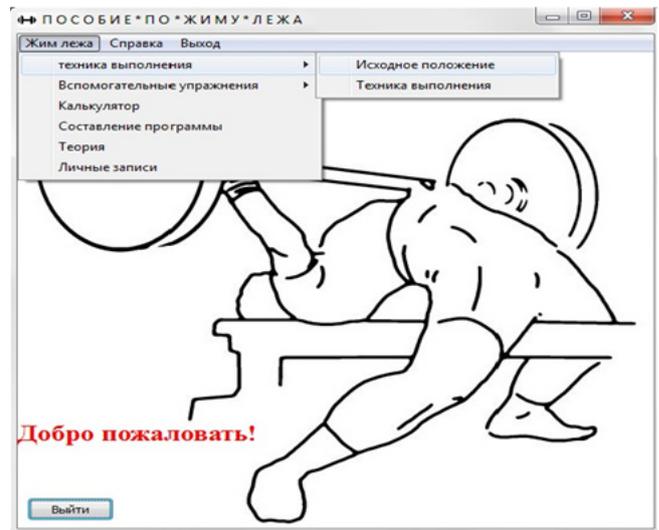


Fig. 3. Transition tab “technique of execution”

1. “Starting position” – when you click on the start, you will see in detail and explain the setting of the bridge during the exercise.

2. “Technique of execution.” It consists of two foreshortened versions of the exercise “Bench Press” and a text describing the technique of doing this exercise.

In the main menu there is also a tab “Auxiliary exercises”, which consists of three points (Figure 4):

1. “Phase of a muscle mass set”. It consists of a set of exercises (animation) accompanied by a textual description of the technique of performing movements.
2. “Intermediate phase”. It consists of a set of exercises (animation) accompanied by a text description of the technique of execution.
3. “Phase of preparation for the competition”. It consists of a set of exercises (animation) accompanied by a text description of the technique of execution.

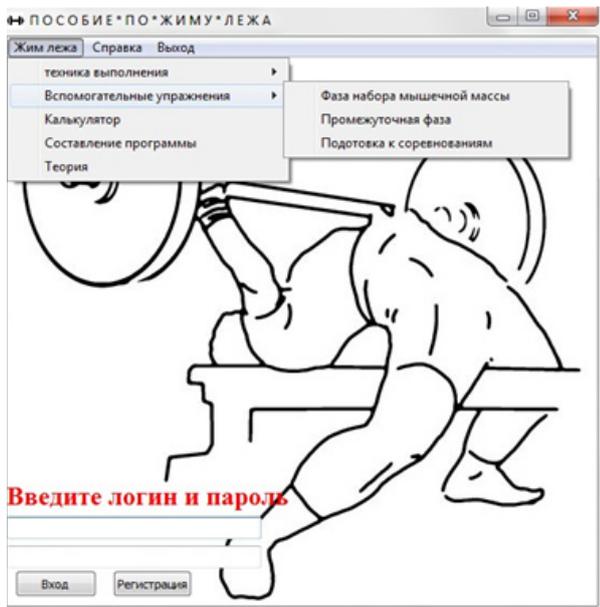


Fig. 4. Transition tab “assistance exercises”

In the main menu when you click on the tab “calculator for the bench press,” a transition is made to the calculator window (Fig. 5).

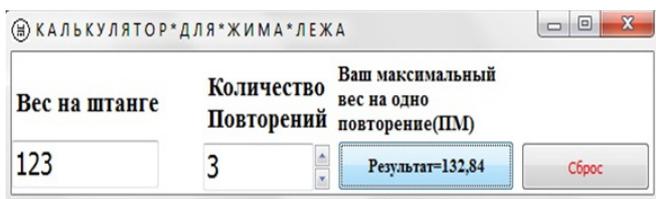


Fig. 5. Calculator window

In it, you need to enter the weight on the rod and the number of repetitions with this weight. When you click on the “Calculate” button, this button displays the result with your repeated maximum (RM). By clicking on the “Training program” tab, a window appears in the main menu where you can generate an approximate training program using the “Number of workouts per week” and “Dead point” survey (Fig. 6). Also, there is a note with an approximate range of training.

By clicking on the “Literature” tab of the window for playing books and a list of books will appear in the main menu (Fig. 7).

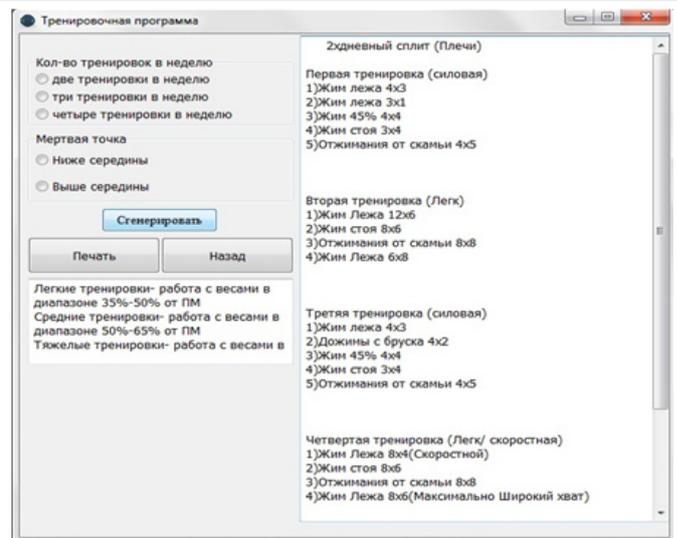


Fig. 6. Window training programs

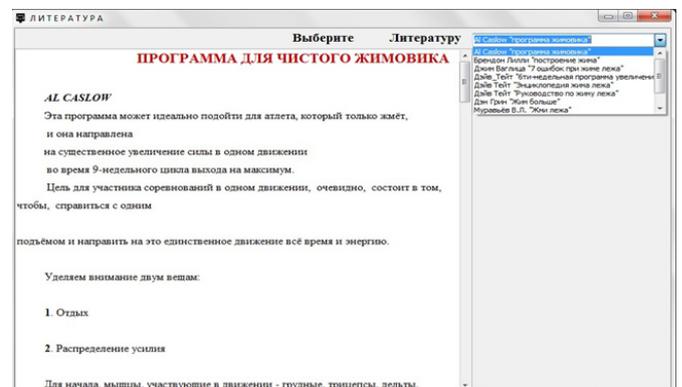


Fig. 7. Window literature

Thus, computer simulation has been carried out; it has been possible to develop a software product that has enough functions to optimize the training process of powerlifters. Computer program “Bench Press” allows the coach to keep a record of individual and group sessions of physical, technical and competitive preparedness, on the basis of which the coach can receive recommendations on the use of complexes of special exercises in the individual training program for each athlete.

Conclusions

Conducted computer programming allowed to develop an innovative software product that allows you to plan training loads based on the proposed sets of exercises. Function of the program, with which you can follow the patterns of variation in load, makes it convenient to use and leads to an increase in the level of strength preparedness of athletes-powerlifters. Computer program “Bench press” can be applied in the practical activity of trainers with the aim of increasing the efficiency of the training process.

Prospects for further research are the introduction of the computer training program “Bench Press” in the training process for powerlifting to improve its quality and efficiency.

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References

- Ashanin, V.S., Pasko, V.V., Podoliaka, O.B., Rovnyi, A.S. & Yermolaiev, V.K. (2015), "Improving complex special physical training of athletes, rugby players 16–18 years", *Slobozans'kij naukovo-sportivnij visnik*, No. 1(45), pp. 16-22. (in Ukr.)
- Zviahintseva, I.M. (2012), *Strength and physical training. Powerlifting: Metodichni vkazivky z dystsyplin "Fizychnne vykhovannia", "Fizychna kultura" dlia studentiv usikh spetsialnostei Akademii* [Strength and physical training. Powerlifting: Methodical instructions on disciplines "Physical education", "Physical culture" for students of all specialties of the Academy], KhDAMH, Kharkiv. (in Ukr.)
- Martyrosian, A., Pasko, V., Rovnyi, A., Ashanin, V., Mukha, V. (2017), "Experimental program of physical training of rugby players at the stage of specialized basic training", *Slobozans'kij naukovo-sportivnij visnik*, No. 3(59), pp. 84-91, doi: 10.15391/sns.v.2017-3.015. (in Ukr.)
- Nizhnichenko, D.O. (2013), "Method of correction of the training process in powerlifting using means of speed-force orientation at the stage of preliminary basic training", *Slobozans'kij naukovo-sportivnij visnik*, No. 2(35), pp. 34-38. (in Ukr.)
- Oleshko, V.H. (2011), *Pidhotovka sportsmeniv u sylovykh vydakh sportu* [Training of athletes in power sports], DIA, Kyiv. (in Ukr.)
- Pasko, V.V. (2017), "Improving rugby training process on the basis of models of physical and technical preparedness", *Sportivnye igry*, No. 1, pp. 38-40. (in Ukr.)
- Pasko, V.V., Poltoratska, H.S. & Voitenko, M.V. (2017), "The use of computer technology in the training process powerlifters", *Naukovo-metodychni osnovy vykorystannia informatsiinykh tekhnolohii v haluzi fizychnoi kultury ta sportu: zbirnyk naukovykh prats*, No. 1, pp. 72-74. (in Ukr.)
- Pasko, V.V. (2008), "The use of computer technologies in the development of tactical thinking among young athletes in gaming sports", *Problemy i perspektivy rozvitiya sportivnykh igr i edinoborstv v vysshikh uchebnykh zavedeniyakh: sb. statey IV mezhdunarodnoy nauchnoy konferentsii, 5 fevralya 2008 goda, Kharkov-Belgorod-Krasnoyarsk* [Problems and prospects for the development of sports games and martial arts in higher educational institutions: Sat. Articles of the IV International Scientific Conference, February 5, 2008, Kharkiv-Belgorod-Krasnoyarsk], pp. 150-152. (in Russ.)
- Pasko, V.V. & Podolyaka, O.B. (2014), "Improvement of the training process of rugby players of 16–18 years", *Materialy X mezhdunarodnoy nauchnoy konferentsii "Problemy i perspektivy rozvitiya sportivnykh igr i edinoborstv v vysshikh uchebnykh zavedeniyakh: [sb. statey]", 7–8 fevralya 2014 goda, Belgorod-Kharkov-Krasnoyarsk* [Materials of the X International Scientific Conference "Problems and Perspectives of Development of Sports Games and Combat Sports in Higher Educational Institutions: [Sat. Articles]", February 7–8, 2014, Belgorod-Kharkiv-Krasnoyarsk], T. 2, pp. 124-127. (in Russ.)
- Pasko, V.V. (2010), "The use of computer technology in the training process in contact sports game (for example, rugby)", *Slobozans'kij naukovo-sportivnij visnik*, No. 1-2, pp. 117-120. (in Ukr.)
- Pasko, V.V. (2016), *Innovatsiini tekhnolohii udoskonalennia fizychnoi ta tekhnichnoi pidhotovlenosti rehbistiv na etapi spetsializovanoi bazovoi pidhotovky: avtoref. dys. kand. nauk z fiz. vykhovannia ta sportu: 24.00.01 "Olimpiiskyi i profesiynyi sport"* [Innovative technologies improving physical and technical preparedness specialized rugby players during basic training: thesis abstract], Dnipropetrovsk, 22 p. (in Ukr.)
- Pasko, V.V. (2017), *Udoskonalennia fizychnoi ta tekhnichnoi pidhotovlenosti rehbistiv na etapi spetsializovanoi bazovoi pidhotovky z vykorystanniam komp'iuternykh tekhnolohii* [Improving the physical and technical preparedness specialized rugby players during basic training using computer technology], KhSAPC, Kharkiv. (in Ukr.)
- Podoliaka, O.B. & Pasko, V.V. (2010), "The feasibility of using computer technology in rugby", *Ukraina naukova: Materialy VII Vseuk. nauk.-prakt. internet-konf., 20–22 hrudnia 2010 roku* [Ukraine academic: the All Materials VII. nauk. and practical. Internet Conf., 20-22 December 2010], Part 8, Kyiv, pp. 28-29. (in Ukr.)
- Podoliaka, O.B. & Pasko, V.V. (2011), "Learning computer program "Rugby 13" to improve the training process in rugby league", *Slobozans'kij naukovo-sportivnij visnik*, No. 4, pp. 163-168. (in Ukr.)
- Rovnyi, A.S. & Pasko, V.V. (2017), "Models of physical fitness as a basis for management training process during rugby specialized basic training", *Naukovyi chasopys Natsionalnoho pedahohichnoho universytetu imeni M.P.Drahomanova, Serii No. 15. "Naukovo-pedahohichni problemy fizychnoi kultury / fizychna kultura i sport": zb. naukovykh prats*, Vypusk 2 (83)17, pp. 92-96. (in Ukr.)
- Rovnyi, A.S. & Pasko, V.V. (2017), "Improving the training process of rugby players with the help of hypoxic training", *Sportivnye igry*, No. 4, pp. 51-55. (in Russ.)
- Sheyko, B.I. (2005), *Pauerlifting. Nastolnaya kniga pauerlifitera* [Powerlifting. Powerlift's desktop book], ZAO YeAM Sport Servis, Moscow.
- Pasko, V.V. (2014), "Perfection of educational-training process on the basis of account of parameters special physical preparedness of rugby-players", *Physical education of students*, No. 3, pp. 49-56.
- Pasko, V.V. (2014), "Perfection of educational-training process on the basis of account of parameters technical preparation of rugby-players", *Slobozhanskiy herald of science and sport*, No. 1(39), pp. 115-121.
- Rovnyi, Anatoly Stepanovitch, Pasko, Vladlena Vitaliivna & Grebeniuk, Oleg Viktorovich (2016), "Adaptation of reformation of physiological functions of the organism of the 400 m hurdlers during hypoxic training", *Journal of Physical Education and Sport (JPES)*, No. 16(4), pp. 1340-1344.
- Rovnyi, Anatoly, Pasko, Vladlena & Martyrosyan, Artur (2017), "Adaptation of the cardiorespiratory system to hypoxic actions of the rugby players depending on the playing position", *Journal of Physical Education and Sport (JPES)*, No. 17 (2), pp. 804-809.
- Rovnyi, Anatoly, Pasko, Vladlena, Stepanenko, Dmytro & Grebeniuk, Oleg (2017), "Hypoxic capacity as the basis for sport efficiency achievements in the men's 400-meter hurdling", *Journal of Physical Education and Sport (JPES)*, No. 17(1), pp. 300-305.
- Swinton, P.A., Lloyd, R., Agouris, I., Stewart, A. (2009), "Contemporary training practices in elite british powerlifters: survey results from an international competition", *J. Strength. Cond Res*, Vol. 23(2), pp. 380-384.

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