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An influence of the training process on the functional state and physical quality indicators of sportsmen-veterans at stages of going off from the high performance sport

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Purpose: *to accomplish the analysis of influence of the training loadings on the indices of the functional state and physical qualities in different age periods of sportsmen-veterans.*

Material & Methods: *researches were conducted with the sportsmen-veterans (football players) of the different age groups (35–40; 41–45; 46–55) who continued to employ and participate in competitions after finishing of active performances in professional commands. The methods of determination of level of motive qualities and indices of the functional state of footballers-veterans were used. Results were calculated by the methods of mathematical statistics.*
Results: *the results of long-term researches of determination of dynamics of changes of motive qualities level and functional state indices during age period 35–55-years of football players are presented.*

Conclusions: *it is determined that during the research period the most changes of level of physical qualities and indices of functional state are received in the period of 35–40 years, that is caused by plummet of the training and competitive loadings after active employments in professional soccer commands.*

Keywords: *sportsmen-veterans, footballers, physical qualities, functional state*.

Introduction

The development of the veterans' movement contributes to the solution of the issue of sports qualification, the awarding of sports ranks for performances of European and world level.

Significantly promote the development of sports veterans movement that in order to get the title of Merited Master of Sports of Ukraine, sportsmen-veterans should at least participate in the competition for over 10 years and to be the world champion in three different age groups.

Currently, the number of kinds of sports veterans, active development in Ukraine has reached 25.

In developed countries (USA, Great Britain, Japan, France, Italy and others) the organization of spectacular rivalry of athletes participating in veterans' competitions is not the main goal. This part of the competition is only a small part of the overall system, which main purpose is to develop the habit of healthy forms of recreation of the general population [10].

However, sportsmen-veterans do not have an official status and therefore are forced to engage in sports without state support, at the expense of sponsors.

The problem of human physical activity throughout life in recent years, paid a lot of attention as it is one of the main issues of human life.

In the process of aging reduces the adaptive capacity of the body, different disease-causing factors are becoming more diverse and dangerous. However, scientists have established that along with the extinction of vital functions, new active adaptive mechanisms are included, which can for a long time preserve at a sufficient level the basic capabilities of the organism. Most notably these mechanisms develop in the body physically active people, so the biological needs of an aging organism in action must constantly meet. However, we must not forget that with age, the optimal value of the load varies, the boundaries between the training and non-training loads narrow [1; 2].
In the body of people who have reached physiological old age, naturally, atrophic changes are observed; gradually and evenly develop in all organs and systems. These changes ultimately lead to a decrease in the functionality of the aging organism.

The development of physical capacity occurs throughout a person's life. In this process, there are three major stage [2].

First – stage of intensive development of motor function and physical characteristics and motor abilities, which are formed on its basis.

Second – stage concerning a slow decline in physical capacity – beginning of regression of physical and motor skills.
Third – phase of involution of motor function of the gradual or rapid reduction of physical capabilities of an old man.
In recent years, the participation of veterans is activated in a variety of sports, but in scientific publications are not presented specific recommendations on features of construction of training process.

According to observations [14], athlete body who has reached

his highest functionality under 25 can stably maintain this level up to 35 years. Then begins the slow decline of body functions, but are determined by the event of victory in the Olympics, World and European Championships and at an older age. This applies primarily to sports with display of endurance (skiing, athletics marathon running, rowing, etc.).

The main condition of physical activity may be a former athlete maintain a moderate level of physical activity (brisk walking, climbing stairs, swimming, skiing trips, dances and games, aerobics and so on up to 30 minutes a day at least 4 times a week depending on the state of the weak parts of the musculoskeletal system [13].

We [9] determined that the main causes of diseases in athletes is the use of inadequate physical activity – 40 cases, the consequences of injuries – 26 cases, unsatisfactory material and living conditions – 5 cases. All of the above indicates that the diseases and injuries of athletes are mainly due to the reasons for the insufficient implementation of the methodological guidelines and regulations established in each sport.

An important factor in the prevention of disease in athletes is their gradual exit from large training and competitive pressures and save further optimal, taking into account age and gender, motor activity. This, in turn, determines the logical solution to the constant monitoring of the physical condition of the sportsmen-veterans of in urban medical and sports clinic. The solution to this institutional problem does not require any financial costs [15].

It is established [3], that the morphological changes in the heart of sportsmen-veterans depend not only on the degree of their preliminary adaptation to physical loads, but also on the orientation of the training process.

Individuals retain the locomotor activity and preparedness in middle and old age tend to live longer than their sedentary counterparts. Older people who choose an active lifestyle, less prone to various chronic diseases, including hypertension, insulin dependent diabetes mellitus, heart disease [13; 15].

Conducted A. Polyakov, R. Korobeynikov [11] survey showed that physical activity of sportsmen-veterans is not only a means of physical and psychological rehabilitation of older people, but also an important factor in slowing down the aging process of involution in the human body.

From the standpoint of the experience gained it seems to assert that important area of modification of exercise in the veterans age can only be a shift towards less complex exercise, and lightweight exercise for the entire set of parameters, primarily on the intensity (sharpness, tempo, effort value) and secondarily, by volume, duration, number of repetitions of movements, the number of sessions per week, and so on. [8]. According to other targets, the change in the nature of physical exercise is inevitable: from a fairly rigidly regulated systematic exercise to “feeling well” with little physical exertion [7].

In addition, the disclosure of matters of major influence, including competitive pressures on the body of the elderly, there is no question about the development of the training process, although various sports, people who have reached 40 years and more, this is not uncommon. Number of participants in the last World Games «Masters Games» veterans, where they took the start over 10 000 athletes over the age of 30 years, which suggests that it is not far off the day when the most popular (mass), the veterans of the game will be at the Olympic Games. Dynamics of growth of the number of participants in the last world championships in swimming and Europe strongly supports this assumption [4; 14].

Despite significant differences in the level of physical potential of people of all ages, it is, however, characterized by a general, inherent in all periods of life, properties of human motor function. This property is the ability of the motor function to adapt to the develop. The latter is not always unidirectional, and not equally intense for all periods of the individual evolution of man, but always provides a more or less necessary balance of the balance between the requirements of the environment, the internal state of the organism and its capabilities.

Communication of the research with scientific programs, plans, subjects

The theme of the article developed under the consolidated plan of research work in the field of physical culture and sports in 2014–2019 years. Ministry of Ukraine for Family, Youth and Sports 2.4.12 1п by theme “Optimization of educational and training activities and competitive sports games”, state registration number 0114U002659.

The purpose of the research

to accomplish the analysis of influence of the training loadings on the indices of the functional state and physical qualities in different age periods of sportsmen-veterans.

Material and Methods of the research

The studies were conducted with sportmen-veterans (players) of different age groups (35–40; 41–45; 46–55 years), continued employment and participation in the competition at the end of active performances in professional teams. Used methods for determining the level of motor skills and the functional condition of veteran football players, the results of which are calculated by methods of mathematical statistics.

Results of the research and their discussion

Physical activity of man, ultimately aimed at changing the state of his body, for the purchase of a new level of physical qualities and abilitiesThe latter can not be achieved any other way, except for training. The basis of the training effect, its mechanism determines the fundamental property of all living things – the ability to adapt, to development based on adaptation to external influences. Knowledge of the laws of adaptation to physical stress becomes one of the most important conditions for the successful organization of human physical activity.

A study of ontogeny motility in athletes and persons who are not involved in sports, conducted in recent years, reveals the following basic patterns of its human evolution:

1. Heterochromic character of the development of links and systems of morphology and functions of the organism that provide for the realization of motor activity.
2. In phase periods of intense growth movements systems

elements and their mismatch with periods of accelerated development of structures.
3. Multilevel rhythmic motor development systems, their elements and structures.
4. The high degree of individuality motor manifestations [7].

Thus, physical activity of the person throughout life, although it has a tendency to fading, however can be quite high and depends on the living conditions and rationally carried out by motor mode.

It was revealed that in 30–40 years, begins the fall in muscle strength, especially sharply expressed it after 60 years, with the greatest efficiency retain muscle most often involved in natural living conditions [6]. It was also established by N. E. Motylianska that physical exercises help maintain muscle strength even at a relatively later age [6].

Mechanisms of adaptation to physical load of persons of mature and old age suggest that individually tailored exercise regimen based on the results of the physiological, biochemical, biomechanical research to developing an impact on the entire system of oxygen transport in the bodyAlong with this, for each athlete there are individual values of the dose volume and intensity of training loads.

Correctly selected training mode leads to an increase in cardiac output both at rest and during exercise, contributing to a more complete filling of the heart with blood during diastole. All this for many years ensures the stability of maximum aerobic performance, only after 30 years it comes down [15]. In addition, studies have shown that as a result of a rationally constructed exercise, there is a significant increase in the density of mitochondria, the amount of mitochondrial enzymes in those muscles that are amenable to training [12].

It can be assumed that with fatigue and further recovery, conditions are simulated and mechanisms for combating aging are formed through mobilization and development of functional reserves, increases the adaptive capacity of the organism and can significantly slow the approach of old age.

Therefore it is advisable to raise the issue of selection for former athletes, as well as for others in physical education, such exercises, fatigue which has specific features of similarity to aging in a given person. This will allow to approach the individualization of physical activity, provides effective control for longevity.

Thus, the analysis of the effect of exercise on the body of people to determine the general thrust loads of character changes according to age: the gradual decline in employment in competitive sports and martial arts because of the growing threat of injury; increase the time allocated for individual sessions; gradual reduction of exercise first speed, and later power orientation; increasing the share of endurance exercise.

In addition, in the second period, the people of mature age is necessary to form a permanent motivation and systematic physical activity, preventive and improving character through the use of different types of exercise and physical labor, various sports, tempering, rehabilitation and psycho-regulatory measures.

Therefore, the construction of the training process of sportsmen-veterans should be aimed at preserving the longevity of sports activities, taking into account:

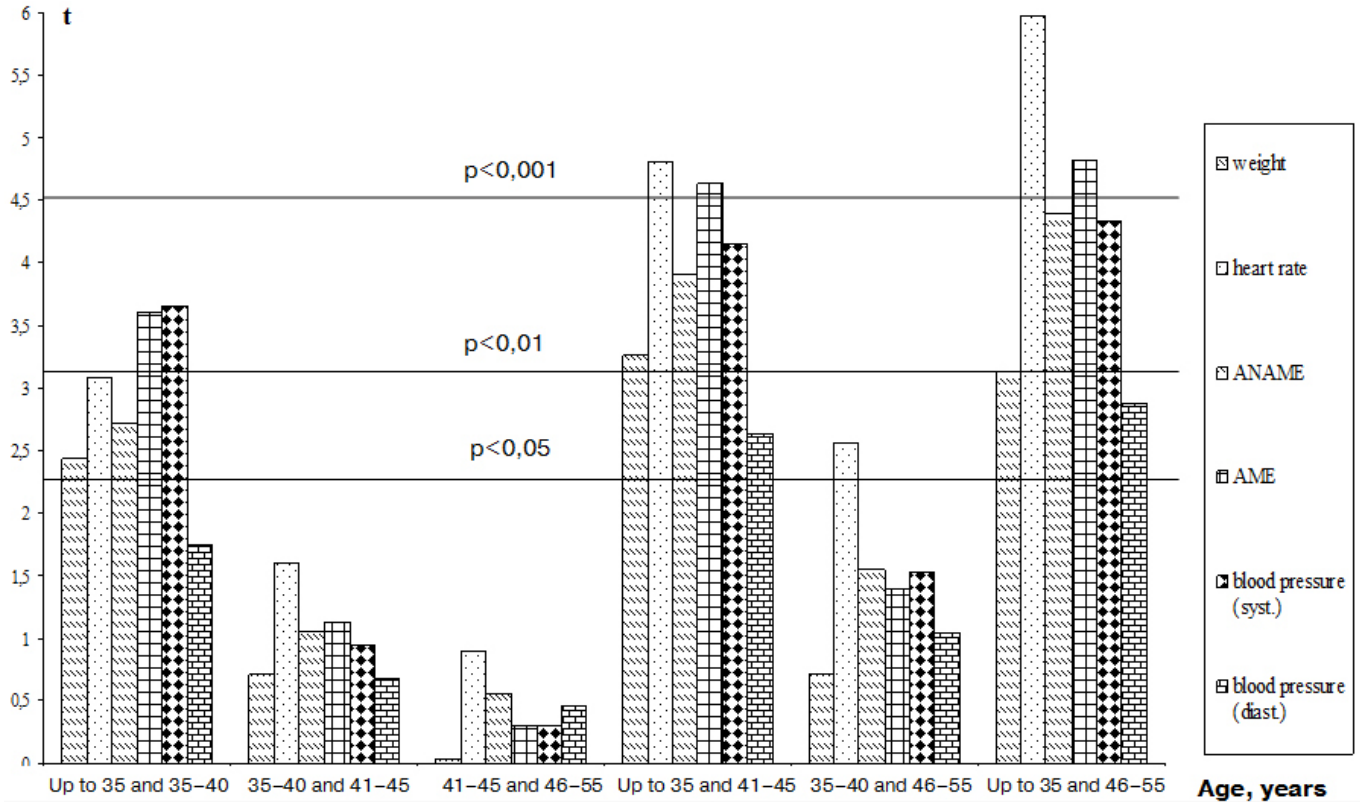

Fig. 1. Numerical values t-test and significant level (p) of the changes of functional state veteran football players at the stages of quitting the sport of higher achievements (n=10)

– sequence of rational combination of the main parties of training;
– age-related changes in functional systems of organism;
– fatigue processes, recovery and adaptation of the organism to functional loads, which are necessary for the construction of the training process of sportsmen-veterans ;
– prolonged exposure to large training and competitive pressures on the body of athletes;
– athletic longevity.

The main feature, which is necessary for the construction of the training process of sportsmen-veterans, is the functional state of body systems. At the same time in the course of life is changing a state of vital organs that determine human performance [3; 5; 11].

In turn, these changes occur gradually (evolution) and discontinuously, resulting in severe disorders of organs and systems due to a variety of stresses, the main of which athletes relates overpotential, resulting in incorrect training process planning.

The change in the functional state of the body systems is also dependent on the nature of work activity and physical activity of a person. Therefore, a very important issue in the training of sportsmen-veterans is to determine the dynamics of changes in the main indicators of the functional state of their body for further consideration of planning the training process.

We conducted the dossier with veterans-football players to show the dynamism of the functional group of the old groups (35–40 rock, 41–45, 46–55) (fig. 1).

According to the results, significant changes mainly obtained in the first period of sports veterans in terms of body weight ($t=2,44$; $p<0,05$), which is further stabilized.

Heart rate also increased in the first age period ($t=2,99$; $p<0,05$), the second (41–45 years – $t=4,55$; $p<0,01$) and third (46–55 years $t=5,15$; $p<0,01$) relative to baseline data.

In addition, the increased blood pressure (from each age period), but statistically significant only measure systolic blood pressure during the first time interval ($t=2,77$; $p<0,05$).

During the first years of training sportsmen-veterans decreased metabolic rates in cardiac ANAME ($t=2,90$; $p<0,05$) and AME ($t=3,44$; $p<0,01$), which later stabilized at the initial data.

Thus, the performance of the functional state of the cardiovascular system of sportsmen-veterans lowered after active performances in competitions ranging from 35–40 years, and further stabilized.

Comparative analysis of indicators of physical qualities of sportsmen-veterans also shows the gradual decrease (fig. 2).

The results of the test show a sharp reduction Cooper's length distance that is overcome in 12 minutes transition athletes in the veterans status ($t=3,13$; $p<0,01$), while further changes are not significant ($p>0,05$) in relation to the age of 35–40 years. The above demonstrates the same type of training activity (2–3 times a week, starting with 40), which helped stabilize their physical fitness. Similar trends are the results of running on 200 and 30 meters ($t=4,33$; $2,55$; $p<0,01$–$0,05$). Speed-strength qualities of sportsmen-veterans, which

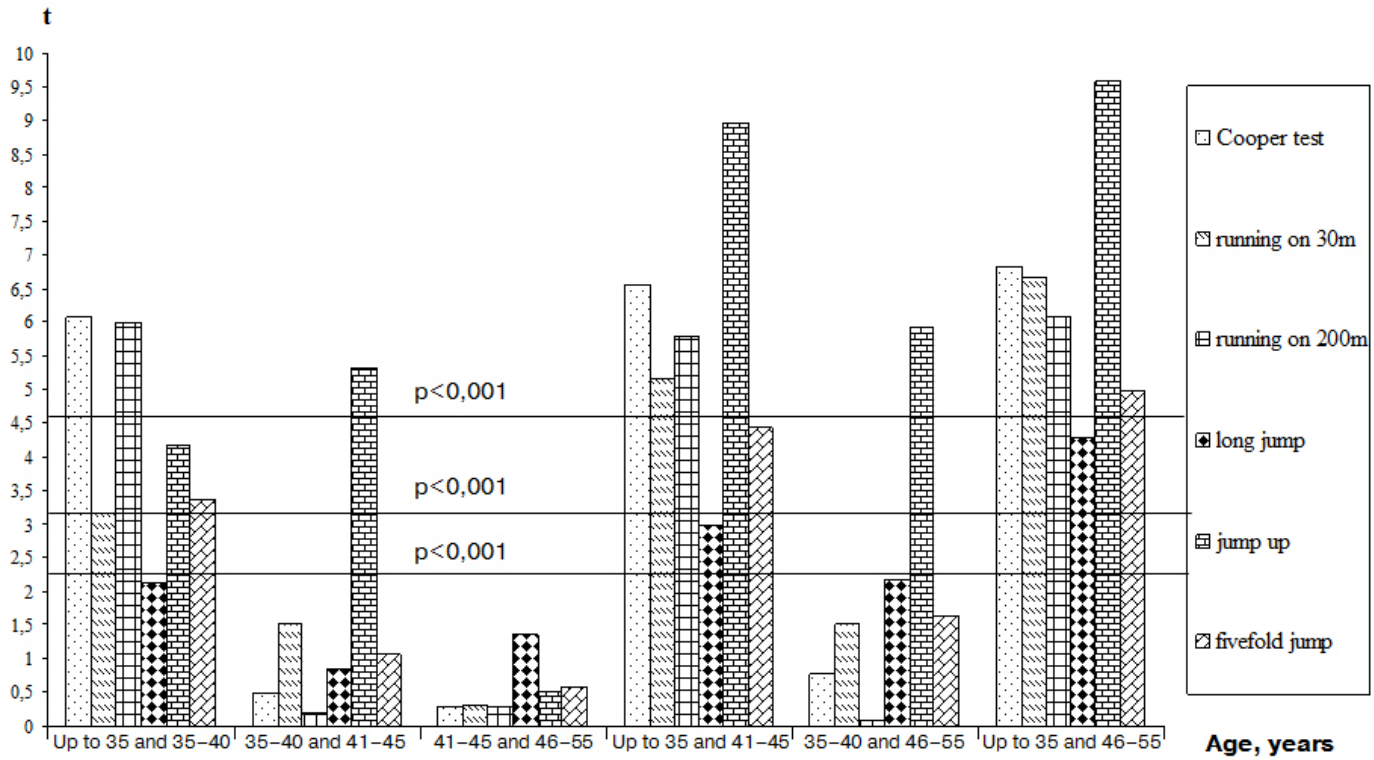

Fig. 2. Numerical value of t-test and significant level (p) of the change in the level of manifestation of physical qualitiesof veteran football players during active sessions at the stages of getting out of the sport of higher achievements (n=10)

manifest themselves in the jump tests, have more significant changes in the indicators in the jump up from the place, which significantly worsened in the first (t=2,82, p<0,05), and also the second (t=3,50, p<0,01) the age periods.

A significant decrease in the results is due to an increase in body weight and a slight use of jumping exercises in training. The results of the long jump from the place are essentially (p>0,05) unchanged during individual age periods, only comparisons of the second and third with respect to the first periods have significant shifts (t=3,18, 4,11, p<0,01). Group average result fivefold jump significantly (t=2,65; p<0,05) immediately after closure deteriorates active sessions results in further stabilized with a tendency to reduce them.
The received results testify to gradual extinction of motor potential of sportsmen-veterans.

Conclusions

1. The functional state of the organism of veteran players is reduced after active performances in the sport unevenly. The greatest changes in the cardiovascular system of players in relation to the data obtained during the active sessions, marked in the heart rate (35–40 years – t_1=2,29, p<0,05; 41–45 years – t_2=4,55, p<0,01; 46–55 years – t_3=5,15, p<0,001), blood pressure syst. (t_1=2,77, p<0,05; t_2=3,94, p<0,01; t_3=4,19, p<0,01) and AME (t_1=3,44, p<0,05; t_2=4,40, p<0,01; t_3=4,57, p<0,01).

2. It is determined that the indicators of testing the level of physical fitness of veteran football players are different in certain age periods. In the first age period (35-40 years) the results related to the manifestation of speed-strength qualities (running at 30 m; jump up from the place, a fivefold jump – p<0,05), as well as special and high-speed endurance (Cooper test – p<0,05; running at 200 m – p<0,01). In the second age period (41–45 years), there was a significant decrease in all the physical fitness indicators compared with the baseline (p<0,05), while the preliminary results (35–40 years) of significant differences, except for the upward jump places not found (p<0,05). The results of testing the older age group (46–55 years) did not change significantly with respect to the age of 41–45 years (p<0,05), which indicates the stabilization of the level of manifestation of physical qualities.

Prospects for further research

Prospects for further research include the identification of features of changes in physical qualities and functional status of sportsmen-veterans engaged in cyclical sports.

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References

1. Arzyutov, G. M. (2000), *Teoriya i metodika poetapnoi pidgotovki sportsmeniv (na materiali dzyudo)*: avtoreferat kand.nauk [Theory and Methods phased training of athletes (based on judo): PhD thesis abstract], Kiiv, 41 p. (in Ukr.)
2. Dubiley, V. B. & Dubiley, P. V. (1988), "The classification of age groups", *Teoriya i praktika fizicheskoy kultury*, No 1, pp. 8–16. (in Russ.)
3. Yevdokimova, T. & Pravosudov, V. (2000), "Changes in the cardiovascular system in sports veterans with various orientation training", *Tezi dop. IV Mizhnarodniy naukoviy kongres «Olimpiyskiy sport i sport dlya vsikh: problemi zdorov'ya, rekreatsii, sportivnoi meditsini ta reabilitatsii», 16–19 travnya 2000 r.* [Theses IV International Scientific Congress "Olympic Sport and Sport for All: health problems, recreation, sports medicine and rehabilitation", 16–19 May 2000], Kiiv, p. 645. (in Russ.)
4. Zhdanov, L. N. (1996), "Age sporting achievements", *Teoriya i praktika fizicheskoy kultury*, Moscow, No 6, pp. 59–60, (in Russ.)
5. Zakharyants, A. (2000), "The problem of social adaptation and rehabilitation of the health of athletes who completed the performance in professional sport", *Tez. dokl. IV Mizhnarodniy naukoviy kongres «Olimpiyskiy sport i sport dlya vsikh: problemi zdorov'ya, rekreatsii, sportivnoi meditsini ta reabilitatsii», 16–19 travnya 2000 r.* [Theses IV International Scientific Congress "Olympic Sport and Sport for All: health problems, recreation, sports medicine and rehabilitation", 16–19 May 2000], Kiiv, p. 649. (in Russ.)
6. Motylyanskaya, R. Ye. (1956), *Sport i vozrast* [Sports and age], Medgiz, Moscow, 302 p. (in Russ.)
7. Mulik, V. V. (2001), *Sistema mnogoletnego sportivnogo sovershenstvovaniya v uslozhnennykh usloviyakh sopryazheniya osnovnykh storon podgotovlennosti sportsmenov (na materiale lyzhnogo sporta)*: avtoref. d-ra nauk po fiz. vosp. i sportu : spets. 24.00,01 – olimpiyskiy i professionalnyy sport [The system of long-term sports perfection in difficult conditions conjugation main parties of athletes (on the skiing material): doct. of sci. thesis], Kyiv, 40 p. (in Russ.)
8. Perevoznik, V. I. (2004), *Osoblivosti pobudovi trenuvalnogo protsesu futbolistiv-veteraniv*: Avtoref. dis. kand. nauk z fiz. vikh. i sportu [Features of construction of training process of football-veterans: PhD thesis abstract], Kharkiv, 21 p. (in Ukr.)
9. Perevoznik, V. I. & Mulik, V. V. (2003), "Comparative characteristics of anthropometric and functional parameters of veteran players 35 years and older", *Slobozans`kij naukovo-sportivnij visnik*, Vol. 6, pp. 91–94. (in Russ.)
10, Platonov, V. N. (2015), *Sistema podgotovki sportsmenov v olimpiyskom sporte* [The system of training athletes in Olympic sports. The general theory and its practical applications], Olim. lit., Kyiv, pp. 332–355. (in Russ.)
11. Polyakov, A. & Korobeynikov, G. (2000), "Biological age and functional condition of sportsmen-veterans", *Tezi dop. IV Mizhnarodniy naukoviy kongres «Olimpiyskiy sport i sport dlya vsikh: problemi zdorov'ya, rekreatsii, sportivnoi meditsini ta reabilitatsii», 16–19 travnya 2000 r.* [Theses IV International Scientific Congress "Olympic Sport and Sport for All: health problems, recreation, sports medicine and rehabilitation", 16–19 May 2000], Kyiv, p. 669. (in Russ.)
12. Pokholenchuk, Yu., Svechnikov, G. & Svechnikova, N. (2000), "About protective and adaptive reactions in the process of aging veterans of sports", *Tezi dop. IV Mizhnarodniy naukoviy kongres «Olimpiyskiy sport i sport dlya vsikh: problemi zdorov'ya, rekreatsii, sportivnoi meditsini ta reabilitatsii», 16–19 travnya 2000 r.* [Theses IV International Scientific Congress "Olympic Sport and Sport for All: health problems, recreation, sports medicine and rehabilitation", 16–19 May 2000], Kyiv, p. 671. (in Russ.)
13. Priyatkin, S. (2000), "Social and medico-biological aspects of maintaining the functional state of the body's systems Veterans Sports", *Tez. dokl. IV Mizhnarodniy naukoviy kongres «Olimpiyskiy sport i sport dlya vsikh: problemi zdorov'ya, rekreatsii, sportivnoi meditsini ta reabilitatsii», 16–19 travnya 2000 r.* [Theses IV International Scientific Congress "Olympic Sport and Sport for All: health problems, recreation, sports medicine and rehabilitation", 16–19 May 2000], Kiiv, p. 672. (in Russ.)
14. Fesenko, S. (2000), "Prospects of veteran sports in Ukraine based on the study of the positive experience of the organization of veterans of the sports movement abroad", *Tezi dop. IV Mizhnarodniy naukoviy kongres «Olimpiyskiy sport i sport dlya vsikh: problemi zdorov'ya, rekreatsii,*

sportivnoi meditsini ta reabilitatsii», 16–19 travnya 2000 r. [Theses IV International Scientific Congress "Olympic Sport and Sport for All: health problems, recreation, sports medicine and rehabilitation", 16–19 May 2000], Kyiv, p. 685. (in Russ.)
15. Shagaev, M. & Vedernikov, V. (2000), "Diseases sports veterans", *Tezi dop. IV Mizhnarodniy naukoviy kongres «Olimpiyskiy sport i sport dlya vsikh: problemi zdorov'ya, rekreatsii, sportivnoi meditsini ta reabilitatsii», 16–19 travnya 2000 r.* [Theses IV International Scientific Congress "Olympic Sport and Sport for All: health problems, recreation, sports medicine and rehabilitation", 16–19 May 2000], Kiiv, p. 688. (in Russ.)

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