

## PECULIAR FEATURES OF MEN PHYSICAL CONDITION IN PLANNING HIGHLY INTENSIVE PHYSICAL LOADS IN WINTER PERIOD

Pryshva O.B.

Lesya Ukrainka Eastern European National University

**Abstract.** Physical functioning of average and high intensity is an important component of mature men's health and longevity. For highly intensive physical functioning organism's physical fitness is required. Human physical condition can change under influence of season factors. *Purpose:* to determine specific features of men's physical condition before their highly intensive physical trainings in winter period and test them. *Material:* 25 men of 35-48 years' age without chronic diseases were chosen for experiment. All they observe healthy life style. Body mass index, physical condition by methodic of Bayevskie were tested. The research was conducted in the following way: in the morning and in the evening of every day. Physical functioning was tested by methodic IPAQ. *Results:* we registered confident ( $p < 0.05$ ) distinctions in men's physical condition before and in the day of their highly intensive physical functioning. We noticed changes in the following: body weight, heart beats rate, adaptation potential of Bayevskiy. The most significant indicator was the marker. For testing of its effectiveness we offered for men to plan highly intensive physical functioning in compliance with this marker during one month. Result was confident ( $p < 0.05$ ) increase of duration and quantity of highly intensive physical trainings, improvement of physical condition by 3.13% in complex test of Bayevskiy. *Conclusions:* Consideration of men's physical condition plays important role in planning their highly intensive physical functioning. Increment of Bayevskiy's adaptation potential by 5.25% can be informative marker in winter period. It is a factor for highly intensive physical functioning planning for definite day.

**Key words:** physical functioning, intensity, physical condition, planning, men, life style.

### Introduction

Human physical condition (PC) is a reflection of person's life style, which changed depending on environment – seasons of year. In mature age PC is conditioned by many factors. Among them there is physical functioning (PF). Physical functioning also is influenced by season factors [5, 15]. Aerobic physical functioning of average and high intensity is especially effective for keeping optimal functional state of mature age men [6]. PF of average intensity does not require significant physical loads and can be realized in domestic or social functioning. For highly intensive physical functioning (HIPF) in mature age certain physical readiness of organism is required. It is reflected in human physical feeling, self-feeling and desire to practice it. Specific feature of such PF planning for mature age men is their independent character [1] and desire to enjoy it [16]. Realization of this desire is connected with healthy organism and excellent physical condition. That is why for planning and control of HIPF current information about men's PC is required. It can facilitate them for HIPF in winter period.

There are very little researches devoted to human PC and its changes, resulted from season influence. It is considered that living in megalopolises neutralizes season impacts on human life style. It is facilitated by acceptable food of each season, unchangeable during all year social rhythm. A number of researches note season variations in eating of China women [9] and Spain population [10]. There is reduction of PF in winter period, comparing with summer [5, 12, and 17]. In researches, conducted in Australia it is noted that with starting of winter period there happens rising of blood pressure and body mass index (BMI) [18]. In other researches it is said that in winter PF is reduced in connection with poor physical condition of elderly people [8].

HIPF is of special importance for health. It results in reduction of blood pressure [13], improvement of metabolism. All these result in optimization of height-weight indicators [14]. At the same time quantity of HIPF trainings of mature men can vary from 3-4 times a week to 2-3 times a month [3]. Most of mature age Europeans have never practiced HIPF or sports regularly [7]. The existing recommendations of World health protection organization (WHO) concerning HIPF are limited only by quantity of recommended minutes per week (not less than 75) and by quantity of trainings (not less than 2, or 20 minutes, trice a week). In recent instructions on PF for European region for 2016-2025 WHO has increased time for HIPF. It is additional preference for health, which is recommended

for all population strata. As on to-day we have not found recommendations concerning PC role in season PF of mature age men. Researches [5, 11, 19, and 20] make us to consider it.

#### **Purpose, tasks of the work, material and methods**

*The purpose of the work* is to determine specific features of men's physical condition before their highly intensive physical trainings. Such data can be used for current HIPF planning in winter period.

*Organization and methods of the research:* experiment consisted of two parts: laboratory and forming. We selected 25 men of 35-48 years' age without chronic diseases. All they observe healthy life style and independently practice HIPF in the form of health related run, swimming, trainings in gym. Physical condition of these men in testing days did not exceed average month standard of Bayevskiy's adaptation potential (APB) – 1.80 absolute units (a.u.) [2]. The research was conducted in the south of Ukraine in winter period during 30 days of laboratory and 30 days of forming experiment.

For studying of men's physical condition we tested body mass index (BMI), ( $kg/m^2$ ). Assessment of physical condition was conducted twice a day: in the morning and in the evening by APB index. Body weight was measured with electronic balance (error up to 50 grams). Blood pressure and heart beats rate (HBR) were registered by automatic tonometers Contec 08A. APB was calculated every morning after night sleep and every evening before sleep according to appropriate recommendations of WHO (1999). HIPF was tested in compliance with international questionnaire IPAQ (*International Physical Activity Questionnaire*) [3]. We studied quantity of trainings in a week and their duration. The received results were noted in individual diaries. Laboratory experiment included comparison of average month PC day indicators of men with indicators before and in day of HIPF. We compared indicators, registered in the morning (M) with indicators, registered in the evening (E) and difference between them during day (M-E) and in the night (E-M). Difference between PC indicators is presented in percents by formula:

$$x=(b-a):a*100\%$$

where,  $x$  – percentage;  $a$  – previous indicator;  $b$  – next indicator of compared pair of numbers.

In case of HIPF registration during several days percentage was calculated only before the first day.

In laboratory experiment men practiced HIPF in usual for them mode. In forming experiment we offered to plan HIPF in compliance with morning information about their PC. Results of forming experiment were processed by weekly data.

Statistical calculation was carried out with the help of non-parametrical statistic, as far as some results did not comply with normal distribution. We determined the following: interquartile range (IR), median (Me). Comparison of indicators' groups was realized with Wilkes's criteria of sign ranks. Programs EXEL and Statgraphics 16 were used.

#### **Results of the research**

Comparing men's PC in ordinary days with PC in HIPF days (see table 1); we found significant distinctions in most of the tested indicators. In HIPF days weight (M) was confidently higher by 0.39%. HBR (M) was higher by 1.18%. APB (M) was higher by 3.61% while APB (E) –2.78%. There were no confident differences in change of APB during day (M-E) and in the night (E-M).

**Table 1.** Comparison of men's PC indicators in ordinary days and in days with highly intensive physical functioning

<b>№</b>	<b>Indicators</b>	<b>Ordinary days (n=705) Me (95%IP)</b>	<b>HIPF (n=99) Me (95%IP)</b>	<b>Difference (%)</b>	<b>W (p)</b>
	Body weight (M) (kg)	87.44 (84.32;90.56)	87.78 (84.11;91.45)	0.39	75941 <0.05
	HBR (M) (b.p.m.)	49.97 (46.35;53.59)	50.56 (47.26;53.86)	1.18	79264 <0.05
	APB (M) (a.u.)	1.66 (1.64;1.68)	1.72 (1.66;1.78)	3.61	8100.5 <0.05
	APB (E) (a.u.)	1.80 (1.77;1.82)	1.85 (1.81;1.90)	2.78	7815.5 <0.05

Difference APB (M-E) (a.u.)	-0.14 (-0.15;-0.12)	-0.14 (-0.18;-0.1)	-	2598 >0.05
Difference APB (E-M) (a.u.)	0.1 (0.07;0.14)	0.1 (0.06;0.13)	-	2609 >0.05

The most important in finding of informative PC indicators were distinctions, registered before and in days of HIPF (see table 2). Body weight (M) was higher in HIPF days by 0.39%. HBR (M) was also higher by 1.96%. APB (M) was higher by 5.25% and APB (E) – by 3.93%. There were no distinctions between APB indicators during day (M-E) and in the night (E-M).

**Table 2.** Comparison of PC indicators before and in days of highly intensive physical functioning

No	Indicator	Before (n=84) Me (95%IP)	HIPF (n=99) Me (95%IP)	Difference (%)	W (p)
	Body weight (M) (kg)	87.44 (84.04;90.84)	87.78 (84.11;91.45)	0.39	25487 <0.05
	HBR (M) (b.p.m.)	49.59 (46.51;52.67)	50.56 (47.26;53.86)	1.96	28843 <0.05
	APB (M) (a.u.)	1.63 (1.57;1.70)	1.72 (1.66;1.78)	5.25	41592 <0.05
	APB (E) (a.u.)	1.78 (1.73;1.84)	1.85 (1.81;1.90)	3.93	34624 <0.05
	Difference APB (M-E) (a.u.)	-0.13 (-0.18;-0.09)	-0.14 (-0.18;-0.1)	-	14847 >0.05
	Difference APB (E-M) (a.u.)	0.15 (0.1;0.19)	0.1 (0.06;0.13)	-	17336 >0.05

Comparing PC indicators before HIPF days with ordinary days it is necessary to be sure that PC indicators, registered before HIPF were less then in ordinary days (see table 3).

**Table 3.** Comparing of men's PC indicators before HIPF days with indicators of ordinary days днями

No	Indicator	Before HIPF (n=84) Me (95%IP)	Ordinary days (n=705) Me (95%IP)	Difference (%)	W (p)
	Body weight (M) (kg)	87.44 (84.04;90.84)	87.44 (84.32;90.56)	-	2260 >0.05
	HBR (M) (b.p.m.)	49.59 (46.51;52.67)	49.97 (46.35;53.59)	0.77	50871 <0.05
	APB (M) (a.u.)	1.63 (1.57;1.70)	1.66 (1.64;1.68)	1.84	51089 <0.05
	APB (E) (a.u.)	1.78 (1.73;1.84)	1.80 (1.77;1.82)	-	42561 >0.05
	Difference APB (M-E) (a.u.)	-0.13 (-0.18;-0.09)	-0.14 (-0.15;-0.12)	-	4015,5 >0.05
	Difference APB (E-M) (a.u.)	0.15 (0.1;0.19)	0.1 (0.07;0.14)	-	32075 >0.05

It was found that body weight (M), APB (E), difference in APB in day (M-E) and in the night (E-M) did not differ confidently ( $p > 0.05$ ). At the same time HBR (M) and APB (M) were confidently less than in ordinary days by 0.77% and 1.84% accordingly. It is proved by worsening of PC indicators just in the morning of HIPF day.

Comparative analysis of men's PC in HIPF days and in ordinary days resulted in certain differences. We used them for current planning of HIPF. In forming experiment men were offered to plan HIPF for days, when APB (M) increased more than by 5.25%, comparing with previous days.

As a result of forming experiment there appeared PC and PF positive changes in men (see table 4).

**Table 4.** Comparison of physical functioning and physical condition indicators in laboratory and forming experiments

No	Indicators	Before (n=98) <i>Me</i> (95%IP)	experiment	After experiment (n=86) <i>Me</i> (95%IP)	Difference (%)	W (p)
	BMI ( <i>kg/m<sup>2</sup></i> )	27.68 (25.63;29.74)		27.99 (25.94;30.04)	1.12	5452.5 <0.05
	HIPF ( <i>quantity/week</i> )	1.08 (0.01;2.15)		1.3 (0.02;2.58)	20.37	4654 <0.05
	HIPF ( <i>minutes/week</i> )	14.34 (10.03;20.65)		18.2 (14.16;22.24)	26.92	4821 <0.05
	HBR (M) ( <i>b.p.m.</i> )	49.14 (46.61;51.67)		48.62 (46.0;51.24)	-	2581 >0.05
	APB (M) ( <i>a.u.</i> )	1.60 (1.49;1.73)		1.55 (1.43;1.66)	3.13	1792.5 <0.05

BMI of men increased by 1.12%. Quantity of HIPF trainings increased by 20.37%. Time of training increased by 26.92%. APB (M) also improved by 3.13%.

#### Discussion

In contingent, chosen for our research there was insignificant increase of BMI (by 10%). This fact can be related (with normal PC indicators) more to muscular tissue than to fat. APB was relatively normal. Morning HBR (M) also reflected healthy cardio-vascular system. HIPF was much less than recommended 75 minutes and less than 2 times a week.

Testing of PC changes in ordinary days and in HIPF days permitted to assess PF (by APB (E)) influence on men's organism and pre-conditions for HIPF trainings. Differences in PC were obvious by all tests, conducted in the morning (body weight, HBR, APB (M)). Confident increase of body weight, HBR and APB before HIPF trainings can be explained by different factors of life activity. But increase of body weight in the morning, worsening of HBR indicators and APB witness about direct influence of eating increase. It also can witness about reduction of PF before. It generates extra energy in organism and stimulates men for HIPF.

Comparison of PC before HIPF days and in HIPF days proved our previous assumptions about body weight increase and relative worsening of PC indicators. Percent age of changes by PC tests was higher than in comparison with ordinary days. Complex test PC – APB (M) gave the highest percentage – 5.25. It is purposeful to use this indicator for current planning of HIPF.

Comparing PC indicators before HIPF with ordinary days witnessed that just before HIPF PC was better. It points at importance of PC exactly in that day.

Confident differences between APB morning-evening (M-E) and ordinary days were not found. It can witness about relatively adequate physical load of men's physical; condition in HIPF days and quick recreation of organism. Testing of APB in the evening of previous day and in the morning (E-M) showed stable recreational process during sleep in different days. That is why there were found no differences between them and ordinary days.

By results of forming experiment we can say that on consideration of APB (M) HIPF weekly quantity and duration depend. In its turn, such functioning optimally influences on men's PC in winter period.

#### Conclusions

Physical condition is very important for HIPF of mature age men. The most informative and acceptable for mass usage PC indicator can be APB (M). Its increase by 5.25% in winter period can be a reason for current planning of HIPF for this day. Consideration of this indicator is effective in optimization of mature men HIPF and PC.

*The prospects of further researches* imply studying of men's physical condition characteristics, which facilitate HIPF in other seasons.

#### Conflict of interests

The authors declare that there is no conflict of interests.

#### References

1. Andrieieva OV. *Teoretiko-metodologichni zasadi rekreacijnoi diial'nosti riznikh grup naseleennia. Dokt. Diss.* [Theoretical-methodic principles of recreation functioning of different population strata. Doct. Diss.], Kiev; 2014. (in Ukrainian)
2. Baevskij RM, Berseneva AP. Donozologicheskaia diagnostika v ocenke sostoianiiia zdorov'ia [Pee-nosological diagnostic in assessment of health condition]. *Valeologiia: diagnostika, sredstva i praktika obespecheniia zdorov'ia.* [Valueology: diagnostic, means and practice of health support], Sankt Petersburg: Science; 1993. (in Russian)
3. Pryshva OB. Osoblivosti fizichnoi aktivnosti cholovikiv zrilogo viku [Specific features of mature age men's physical functioning]. *Molodizhnij naukovij visnik Skhidnoevropejs'kogo nacional'nogo universitetu imeni Lesi Ukrainki.* 2013;10:59-63. (in Ukrainian)
4. Pryshva OB. Vpliv intensivnosti fizichnoi aktivnosti cholovikiv zrilogo viku na ikhnij fizichnij stan [Influence of mature men physical functioning's intensity on their physical condition]. *Fizichne vikhovannia, sport i kul'tura zdorov'ia u suchasnomu suspil'stvi.* 2014;4:77–83. (in Ukrainian)
5. Pryshva OB. Season physical functioning dynamic of men with different physical condition. *Pedagogics, psychology, medical-biological problems of physical training and sports,* 2015;10:56-61. <http://dx.doi.org/10.15561/18189172.2015.1009>
6. Rovnij AS, Rovnij VA, Rovna OO. *Fiziologiia rukhovoii aktivnosti* [Physiology of motor functioning]. Kharkov; 2014. (in Ukrainian)
7. C'os' A, Bergier Iu, Sabirov O. Riven' fizichnoi aktivnosti studentiv vishchikh navchal'nikh zakladiv [Physical functioning of higher educational establishments' students]. *Fizichne vikhovannia, sport i kul'tura zdorov'ia u suchasnomu suspil'stvi,* 2015;3(31):202–210. (in Ukrainian)
8. Aoyagi Y, Park H, Watanabe E, Park S, Shephard R. Habitual physical activity and physical fitness in older Japanese adults: the Nakanojo Study. *Gerontology,* 2009;55(5):523–531.
9. Cai H, Shu XO, Hebert JR, Jin F, Yang G, Liu DK, Gao YT, Zheng W. Variation in nutrient intakes among women in Shanghai, China. *Eur. J. Clin. Nutr.* 2004;58:1604–1611.
10. Capita R, Alonso-Calleja C. Differences in reported winter and summer dietary intakes in young adults in Spain. *Int. J. Food Sci. Nutr.* 2005;56:431–443.
11. Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. *Lancet.* 2012;380(9838):247–257.
12. Hamilton SL, Clemes SA, Griffiths PL. UK adults exhibit higher step counts in summer compared to winter months. *Annals of Human Biology,* 2008;35(2):154–169.
13. Kelley GA, Kelley KS, Tran ZV. Walking and resting blood pressure in adults: a meta-analysis. *Prev Med.* 2001; 33(2):120–127.
14. Kelley GA, Kelley KS, Tran ZV. Walking, lipids, and lipoproteins: a meta-analysis of randomized controlled trials. *Prev Med.* 2004; 38(5):651–661.
15. McCormack GR. Sex- and age-specific seasonal variations in physical activity among adults. *J Epidemiol Community Health,* 2010;64(11):1010-1016.
16. Teixeira PJ, Carraca EV, Markland D, Silva MN, Ryan RM. Exercise, physical activity, and self-determination theory: a systematic review. *Int J Behav Nutr Phys Act.* 2012;9:78-90.
17. Tudor-Locke C, Bassett Jr. D, Swartz A. A preliminary study of one year of pedometer self-monitoring. *Annals of Behavioral Medicine,* 2004;28(3):158–162.
18. Ulmer H, Kelleher C, Diem G, Concin H, Ruttman E. Estimation of seasonal variations in risk factor profiles and mortality from coronary heart disease. *Wien Klin Wochenschr.* 2004;116:662–668.

19. Penzie SA. Physical state of the second mature age men working as teachers of higher educational establishments. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013;2:52-55. doi:10.6084/m9.figshare.639259
20. Adamchuk Ja, Kovalsky P, Boguzhgevsy D, Ochal A, Siversky M. Attitudes toward the health of men that regularly occupy in a trainer hall. *Pedagogics, Psychology, Medical-Biological Problems of Physical Training and Sports*, 2012;2:138-145.

<b>Information about the author:</b>
<b>Prushva O.B.;</b> <a href="http://orcid.org/0000-0002-3727-5142">http://orcid.org/0000-0002-3727-5142</a> ; ooobc@yahoo.com; Lesya Ukrainka Eastern European National University; Volya Avenue 13, Lutsk, 43025, Ukraine.
<b>Cite this article as:</b> Pryshva O.B. Peculiar features of men physical condition in planning highly intensive physical loads in winter period. <i>Pedagogics, psychology, medical-biological problems of physical training and sports</i> , 2016;2:46–51. doi:10.15561/18189172.2016.0207
The electronic version of this article is the complete one and can be found online at: <a href="http://www.sportpedagogy.org.ua/html/arhive-e.html">http://www.sportpedagogy.org.ua/html/arhive-e.html</a>
This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited ( <a href="http://creativecommons.org/licenses/by/4.0/deed.en">http://creativecommons.org/licenses/by/4.0/deed.en</a> ).
Received: 18.01.2016 Accepted: 10.02.2016; Published: 28.02.2016