https://doi.org/10.31489/3081-0531/2025-1-1/45-50
UDC: 612.176.4
Received: 25.05.2025 | Accepted: 19.06.2025

G.D. Kurbanova[1*], V.A. Seksenov[2], K.B. Adanov[3]

[1, 2]*Private Institute Academy Bolashak, Karaganda, Kazakhstan;*
[3]*Pavlodar Pedagogical University, Pavlodar, Kazakhstan*
([*]*Corresponding author's e–mail: gozkur@mail.ru)*

[1]*ORCID 0000-0002-1189-0227*
[2]*ORCID 0009-0006-2853-9800*
[3]*ORCID 0000-0001-6050-8664*

Ways to prevent men's cardiovascular diseases during training at the gym

The article presents a significant cause of male mortality and the results of empirical observations of a group of 7 men working out in the gym under the supervision of a trainer. Men are more susceptible to cardiovascular diseases earlier and more than women. Wellness training and psycho-emotional stability have a preventive effect on the development of cardiopathology. Men's regular gym-based training for 3–6 months, 3 times a week for 1.5 hours in the gym, increased personal self-esteem and satisfaction, improved body composition, but at the same time, prenosological diagnostics of the functional parameters of the cardiovascular system of the examined patients gave unsatisfactory results. To reduce the risk of diseases of the cardiovascular system in men, it is necessary to carry out a prenosological diagnosis of the functional state with subsequent correction of the structure of the training load, perform individually dosed cardio in a sufficient and safe range of heart rate and breathing exercises.

Keywords: men's health, cardiovascular system, strength training, functional tests, dosed aerobic load.

Introduction

According to the World Health Organization (WHO), cardiovascular diseases are the leading cause of mortality among the adult population in the world, including in Kazakhstan [1]. Numerous studies have shown that men are prone to developing heart diseases 10–15 years earlier than women, starting at about the age of 25 [2–5].

Today, the government places significant emphasis on the early diagnosis and treatment of cardiovascular diseases. Advanced high-tech cardiac surgeries are being implemented to treat patients with severe chronic heart failure.

At the same time, global experience proves that preventive measures are more effective than a clinical approach to solving the problem. Positive changes in the current situation can be expected only with the activation of the disease prevention and health promotion system — changes in a person's lifestyle, where key roles are played by health-improving training and psycho-emotional resilience.

Currently, there is a wide network of wellness centers that successfully promote fitness programs of various orientations, but men tend to participate less in group classes and prefer working out in the gym. Moreover, not all of them seek guidance from a trainer to develop a personalized training program; many independently determine their training load on their own.

Based on the aforementioned, it was decided to assess how much regular gym exercises protect the body from health disorders and to evaluate the preventive effect in terms of reducing cardiovascular risk factors in men.

Methods and materials

To achieve the stated objective, a group of 7 people who regularly exercised at the gym (3 times a week for 1.5 hours for 3–6 months) was examined.

The individual training load was assigned by the trainer, who also conducted ongoing pedagogical observations to ensure correct exercise performance.

The gym is equipped with a variety of fitness equipment for strength training. In addition, during the workout, the participants received a dosed aerobic load on a treadmill.

The age of the observed people: 6 people between 22–27 years and 1 person aged 50 years old. Functional indicators were measured before training.

The study used simple, accessible methods of prenosological diagnostics of basic functional indicators:

- blood pressure — BP,
- heart rate — HR,
- stroke volume — SV, was calculated using Starr's formula
- cardiac output — CO = SV*HR
- circulatory efficiency coefficient — CEC
- Breath Holding test (Stange's test) — BHT,
- modified Romberg maneuver — static balancing — SB,
- Kerdo's vegetative index assessment — KVI
- Baevsky's adaptation potential — AP

The following average normative values were used as criteria: BP — 120/80 mmHg, HR — 60-80 beats per minute, SV — 60 mL, BHT — 50 seconds, SB — 15 seconds.

To assess the mental state, anxiety levels were tested using the Spielberger-Hanin scale, and levels of Physical Satisfaction Score (PSS), Social Satisfaction Score (SSS), and Mental Satisfaction Score (MSS) were determined according to I.A. Gundarov's method (on a 100-point scale) [6].

The results are shown below.

Results and Discussion

An analysis of the cardiovascular system indicators (Table 1) shows that the HR in two participants (25.6 %) exceeds the norm (60–80 beats per minute). Diastolic pressure was elevated in six out of the seven participants. Stroke volume did not reach the normative value in any of the participants.

Table 1

Cardiovascular system indicators of men training at the gym

№	Name	Age (in years)	HR (bpm)	BP (mmHg)	SV (mL)	CO (mL)	AP (points)	CEC
1	P.A.	22	89	165-135	21,8	1940,2	3,651	2670
2	G.D.	20	76	120-90	50	3800	2,238	3040
3	K.A.	25	72	120-80	58	4176	2,319	2880
4	O.I.	50	72	120-90	32	2304	2,713	2160
5	A.R.	27	84	125-90	48,3	4057,2	2,737	2940
6	G.A.	23	72	120-90	48,2	3470,4	2,281	2160
7	A.B.	24	72	110-90	42,6	3067,2	2,137	2160

The definition of adaptive potential (AP) according to R.M. Baevsky was used as a criterion for the adaptive capabilities of a whole organism. According to Baevsky's research, the higher the numerical value of AP, the lower the level of functional (adaptive) capabilities of the human body [7]. A reference point of 2.11 points is used, above which indicates strain in the adaptation mechanisms, and below that — a satisfactory level of adaptation. As shown in Table 1, all participants exhibited varying degrees of strain in their adaptation mechanisms.

Normally, the circulatory efficiency coefficient (CEC) in a healthy individual ranges from 2000 to 2600. An increase in this indicator suggests impaired cardiac function and reduced adaptive capacity of the cardiovascular system, which was observed in four out of the seven participants.

We would like to pay special attention to the indicators of 22-year-old patient №1 P.A.: heart rate, blood pressure, both systolic and diastolic are elevated (165-135 mmHg), there are low systolic (21.8 ml with

 ISSN 3081-0531 (Print) ISSN 3081-054X (Online)

a norm of 60-80 ml), and minute blood volumes, tension of adaptation mechanisms, and a slightly increased CEC.

Overall, regardless of the participants' age, their indicators reflect an unsatisfactory functional state of the cardiovascular system.

Table 2 presents the results of the Stange's test (BHT), static balancing (SB), and Kerdo's vegetative index (KVI).

A Breath Holding time of 50–60 seconds is considered a good result for untrained people, 40–49 seconds is satisfactory, and less than 39 seconds is unsatisfactory. For trained people, a good result ranges from 60 to 90 seconds or more.

As shown in the table below (Table 2), 6 participants demonstrated good Breath Holding results, and one — № 5 A.R. showed a satisfactory result, notably, participant № 1 P.A., who is in the risk group, had a high score.

In the assessment of SB, maintaining the pose for 15 seconds is considered a satisfactory result, indicating the participant's ability to maintain body equilibrium — a result demonstrated by all participants.

The results of the Kerdo's Vegetative Index (KVI) assessment (Table 2) indicate a predominance of the sympathetic division of the autonomic nervous system (ANS) among the participants, since when the sympathetic and parasympathetic divisions of the ANS are balanced, the KVI = 0, and if the KVI is less than 0, the parasympathetic division of the ANS predominates.

In our case, the KVI of the all participants is more than 1, moreover, the greatest predominance of the sympathetic nervous system was noted in №1 P.A.(1,51).

Table 2

Indicators of the functional capabilities of the respiratory system and static balancing in men training at the gym

№	Name	BW (kg)	H (cm)	BHT (sec)	SB (sec)	KVI
1	P.A.	94	178	75	20	1,51
2	G.D.	70	182	51	15	1,18
3	K.A.	89	186	55	25	1,1
4	O.I.	82	183	50	19	1,25
5	A.R.	90	175	41	33	1,07
6	G.A.	72	179	53	20	1,25
7	A.B.	67	176	66	18	1,25

Many researchers emphasize the special role of personal self-assessment of well-being in evaluating health status. For this purpose, various subjective health characteristics are proposed: "the ability to live a full life in close connection with what I love", "I am healthy when I am in balance, when I am able to do what I want", "it is the choice of a lifestyle that allows me to enjoy my health" [8].

I.A. Gundarov (1993) proposed a method for determining the "health quality", including an assessment of a person's physical, mental and social satisfaction, which can be easily measured and quantified [6]. Such an assessment can be carried out either through a survey or by filling out a standard questionnaire. The "health quality" reflects not the living conditions or the state of the body, but the individual's satisfaction with their bodily condition in relation to their living conditions and various aspects of life. This group of indicators includes the results that characterize a person's well-being, activity, and mood.

The social and psychological aspects of health determine the harmonious process of developing a person's inner world (self-acceptance — understanding, accepting, analyzing, controlling, loving) and relationships with others, adaptation in society [9]. Subjective self-assessment of health is no less important than objective health indicators. To assess the mental state and satisfaction, a survey was conducted using the Spielberger-Khanin's scale and the level of physical, social and mental satisfaction according to Gundarov (Table 3).

Table 3

Assessment of personal anxiety — according to Spielberger-Khanin scale and satisfaction level according to Gundarov

№	Name	PSS (points)	SSS (points)	MSS (points)	PA (points)
1	P.A.	70,0	100,0	99,7	43,0
2	G.D.	80,0	100,0	99,8	47,0
3	K.A.	80,0	100,0	99,3	45,0
4	O.I.	90,0	100,0	99,8	35,0
5	A.R.	60,0	100,0	99,8	34,0
6	G.A.	80,0	90,0	99,9	39,0
7	A.B.	80,0	100,0	99,5	44,0

According to the results represented in Table 3, the satisfaction levels of the men training at the gym are high (PSS 77,1±10,0, SSS 98,6±3,3, MSS 99,7±0,2), with the exception of № 5 A.R., whose PSS score was an average value of 60.0.

Moreover, in the group of men training at the gym, we identified the following: a lower anxiety level 41,0±4,3, and higher social (SSS — 98,6±3,3) and mental satisfaction (MSS 99,7±0,2).

It should be noted that all the surveyed participants rated their physical, social and mental satisfaction significantly higher than average, compared to the period before starting their training at the gym.

A significant indicator of the effectiveness of training is an increase in muscle mass, an increase in bone density, reduction of visceral fat. According to the results of a study of body composition by bioimpedance measurement using a TANITA multi-frequency analyzer, the majority of the surveyed were younger in body composition than their calendar age [10].

However, when comparing the functional state and the compositional age, the results did not align. It turned out that being slim is not a guarantee of good health.

The cardiovascular system reflects the body's reactions to external and internal factors, and its indicators are primary for the prenosological assessment of the overall functional state of the body.

Certainly, prenosological diagnostics do not replace medical supervision, but it helps prevent the development of disorders that lead to the onset of diseases.

The conducted research demonstrated that regular strength training for 3–6 months in the gym had a positive impact on the psycho-emotional state of men, body composition, but did not have a positive effect on the studied functional indicators of the cardiovascular system. This, apparently, indicates insufficient aerobic load for effective cardiovascular training.

Conclusions

- to solve the problems of health-improving training — reducing the risk of cardiovascular diseases in men, it is necessary to conduct a prenosological diagnostics of the functional state followed by the correction of the training load structure.

-it is important to get cardio training in a sufficient and safe range of heart rate (HR). This range is different for each person. The safe pulse zone (BPZ) for cardio training can be calculated using the formula: 220 — age and perform aerobic exercises at a heart rate of 60–80 % of the result for 30 minutes per workout.

-to pay attention to dosed aerobic loads and breathing exercises for a positive effect on the state of the cardiovascular system.

-pay attention to breathing exercises for a positive effect on the state of the cardiovascular system.

References

1 WHO. Cardiovascular diseases. (n.d.). *www.who.int.* Retrieved from https://www.who.int/ru/health-topics/cardiovascular-diseases#tab=tab_1.

2 Kurbanova, G.D., Tnimova, G.T., & Seksenov, V.A. (2020). Subektivnaia otsenka zdorovia muzhchinami i zhenshchinami [Subjective health assessment by men and women]. Proceedings from The Interuniversity Scientific and Practical Conference with International Participation dedicated to the 75th Anniversary of the Victory of the Soviet People in the Great Patriotic War (*7 maia*

2020 goda): "Socio-Hygienic and Clinical Problems of Modern Medicine" (pp. 51-53). A.I. Evdokimov Moscow State University of Medicine and Dentistry [in Russian].

3 Drapkina, O.M., Kupreishvili, L.V., & Fomin, V.V. (2017). Kompozitsionnyi sostav tela i ego rol v razvitii metabolicheskikh narushenii i serdechno-sosudistykh zabolevanii [Body composition and its role in development of metabolic disorders and cardiovascular diseases]. *Kardiovaskuliarnaia terapiia i profilaktika — Cardiovascular Therapy and Prevention, 16(5),* 81–85 [in Russian].

4 Apanasenko, G.L., & Popova, L.A. (2000). Meditsinskaia valeologiia [Medical valeology]. *Rostov na-Donu: Feniks, 248* (4) [in Russian].

5 Voitenko, V.P. (1991). Zdorove zdorovykh. Vvedenie v sanologiiu [The Health of the Healthy: Introduction to Sanology]. Kyiv: Zdorovia, 246.

6 Gundarov, I.A., & Polesskii, V.A. (1993). Aktualnye voprosy prakticheskoi valeologii [Current issues of Practical Valeology]. In *Valeology: Diagnostics, Means and Practice of Health Maintenance.* Saint Petersburg, 25–32 [in Russian].

7 Baevskii, R.M., & Berseneva, A.P. (1990). Adaptatsionnyi potentsial sistemy krovoobrashcheniia i voprosy donozologicheskoi diagnostiki [Adaptation potential of the circulatory system and issues of prenosological diagnostics]. *Problemy adaptatsii detei i vzroslogo organizma v norme i patologii — Problems of Adaptation of Children and Adults in Normal and Pathological Conditions*. Moscow: IGMI, 172 [in Russian].

8 Solodkov, A.S., & Sologub, E.B. (2001). Fiziologiia cheloveka. Obshchaia. Sportivnaia. Vozrastnaia [Human Physiology: General, Sports, and Age-related]. Moscow: Olimpiia Press [in Russian].

9 Kornienko, D.S., Kozlov, A.I., & Otavina, M.L. (2016). Vzaimosviaz samootsenok zdorovia i psikhologicheskogo blagopoluchiia u prakticheski zdorovykh i imeiushchikh khronicheskie zabolevaniia molodykh liudei [Differences in self-assessment of health and psychological well-being between healthy and unhealthy young adults]. *Hygiene & Sanitation (Russian Journal), 95(6),* 577–581. DOI: 10.18821/0016-9900-2016-95-6-577-581 [in Russian].

10 Tanita Vesy i analizatory sostav tela [Tanita. Scales and Body Composition Analyzers]. *(n.d.). medves.ru.* Retrieved from http://medves.ru/f/tanita_2016_2.pdf [in Russian].

References

1 WHO. Cardiovascular diseases. (n.d.). *www.who.int.* Retrieved from https://www.who.int/ru/health-topics/cardiovascular-diseases#tab=tab_1.

2 Курбанова Г.Д., Тнимова Г.Т., Сексенов В.А. Субъективная оценка здоровья мужчинами и женщинами // Материалы межвузовской научно-практической конференции с международным участием, посвящённой 75-й годовщине Победы советского народа в Великой Отечественной войне «Социально-гигиенические и клинические проблемы современной медицины». — ФГБОУ ВО Московский государственный медико-стоматологический университет им. А.И. Евдокимова. — 7 мая 2020. — С. 51–53.

3 Драпкина О.М. Композиционный состав тела и его роль в развитии метаболических нарушений и сердечно-сосудистых заболеваний / О.М. Драпкина, Л.В. Купрейшвили, В.В. Фомин // Кардиоваскулярная терапия и профилактика. – – 2017. — 16(5). — С. 81–85.

4 Apanasenko, G.L., & Popova, L.A. (2000). Meditsinskaia valeologiia [Medical valeology]. *Rostov na-Donu: Feniks, 248* (4) [in Russian].

5 Войтенко В.П. Здоровье здоровых: Введение в санологию / В.П. Войтенко. — К.: Здоровья, 1991. — 246 с.

6 Гундаров И.А. Актуальные вопросы практической валеологии / И.А. Гундаров, В.А. Полесский // Валеология: диагностика, средства и практика обеспечения здоровья. — СПб., 1993. — С. 25–32.

7 Баевский Р.М. Адаптационный потенциал системы кровообращения и вопросы донозологической диагностики / Р.М. Баевский, А.П. Берсенева // Проблемы адаптации детей и взрослого организма в норме и патологии. М.: ИГМИ, 1990. — с. 172.

8 Солодков А.С. Физиология человека. Общая. Спортивная. Возрастная: учеб. / А.С. Солодков, Е.В. Сологуб // М.: Олимпия Пресс, 2001.

9 Корниенко Д.С. Взаимосвязь самооценок здоровья и психологического благополучия у практически здоровых и имеющих хронические заболевания молодых людей / Д.С. Корниенко, А.И. Козлов, М.Л. Отавина // Гигиена и санитария. — 2016. — 95(6). — С. 577–581. DOI: 10.18821/0016-9900-2016-95-6-577-581.

10 Tanita Весы и анализаторы состав тела [Электронный ресурс]. — Режим доступа: http://medves.ru/f/tanita_2016_2.pdf.

Information about authors

Kurbanova, Gozel Dzhumakalievna (contact person) — Candidate of biological sciences, Associate Professor, Private Institute Academy Bolashak, Karaganda, Kazakhstan; e-mail: gozkur@mail.ru, ORCID ID: 0000-0002-1189-0227

Seksenov, Vasilyi Aitmuhamedovich — Master of Pedagogical Sciences, Vice Dean for Academic Affairs, Pavlodar Pedagogical University, Pavlodar, Kazakhstan; e-mail: 221988@mail.ru, ORCID ID: 0009-0006-2853-9800

Adanov, Kuanyshbek Bulanovich — PhD, Associate Professor, Rector, Institute Academy Bolashak, Karaganda, Kazakhstan; e-mail: kuka_112@list.ru, ORCID ID: 0000-0001-6050-8664

 ISSN 3081-0531 (Print) ISSN 3081-054X (Online)