



DOI:10.28925/2664-2069.2021.19

UDK: 61:005.32

HEALTH MOTIVATION AND ITS RELATIONSHIP WITH CARDIO-RESPIRATORY SYSTEM'S BIODEMOGRAPHIC AND ANTHROPOMETRIC CHARACTERISTICS AS WELL AS FUNCTIONAL STATE AMONG SICK AND HEALTHY PEOPLE

Savchenko Valentyn^(ACDF), Tymchyk Olesia^(BDE), Nevedomska Yevheniia^(BDE), Omeri Iryna^(BDE), Buriak Olha^(BDE), Kharchenko Halyna^(BDE), Yatsenko Svitlana^(BDE)

Borys Grinchenko Kyiv University, Kyiv, Ukraine

Author contribution:

A – study concept and design; B – data collection; C – data analysis and interpretation; D – paper writing; E – paper editing; F – paper final adoption

Abstract

Relevance. Health acts as a resource of comprehensive human life. Preserving health depends on various health-preserving actions whose completion requires the corresponding efforts related to motivation. The hypothesis of the research consisted in stating that functional capabilities of a human are interrelated with the level of motivation and health.

The *aim of the research* is to determine the level of motivation to health among sick and healthy people and examine its relationship with cardiorespiratory system's biodemographic and anthropometric characteristics as well as its functional state.

Material and methods. There were 577 healthy and sick people. The number of patients suffering from chronic diseases accounted for 353 (61.18%), and healthy people (student youth) – 224 (38.82%). 317 (54.94%) out of them were men, and 260 (45.06%) – women. The examined' average age constituted ($M \pm S$) 34.95 ± 17.71 years old. The height and body mass were measured. The cardiorespiratory system's functional state was estimated by integral indicators: the blood circulation system's adaptation potential, the level of physical state, birth-death ratio, Skibinski's index, Kerdo index, wrist force index. Motivation to health was studied by a short survey for determining locus control. The results of the survey were scaled into four gradations of the motivation level: very low, low, medium, and high.

Results. Among the examined sick and healthy people the medium level of motivation to health prevailed – 55.11% (318/577). The next level by the quantity of defined cases is the high one – 38.65% (223/577), and the low one – 6.24% (36/577). Among healthy people the high level of motivation prevailed – 53.13% (119/224), and among sick people – the medium one: 62.04% (219/353). It was found that for young people mostly the high motivation level is inherent, and for elderly people – the low and medium ones. For people with body mass lower than 60 kg the high level is common, and for the ones with body mass 100 kg and more – the medium level of



motivation. The high level of motivation prevails under condition of satisfying adaptation potential, high level of physical state, full compliance of respiratory function and body mass, as well as prevailing of the high level of motivation among people with higher than average and great relative wrist force.

Conclusions. The high level of motivation to health prevails among healthy people, and the low level – among people having diseases. There is a considerable relationship between motivation to health and a person's age, body mass, and its functional capabilities (the cardiorespiratory system's state).

Key words: motivation, health, age, body mass, cardiorespiratory system, functional state, sick, healthy.

Introduction. At all times health is the highest value of a human. Health acts as a resource of comprehensive human life. Not every person takes care of this resource and worries about it. Preserving health depends on various health-preserving actions, whose completion requires the corresponding efforts related to motivation.

In the general sense motivation (from Latin *movere*) is an incentive for action – a specific force making people act and reach the set goals. In nowadays' psychology, motivation indicates the system of factors determining behavior (notably, the aim, needs, motives, intentions, longings, etc.) and characterizing the process stimulating and supporting behavioral activity at the specific level.

Motivation can also be defined as a set of psychological processes directing and supporting human behavior, inducing to reaching specific goals, and determining a personality's activity [1, 2].

If we take preserving or recovery of our own health as a goal, motivation is first of all an individual / personal phenomenon. In national and foreign scientific and popular literature motivation to health is interpreted as motivation to healthy lifestyle among

people of different age.

Motivation to healthy lifestyle is a set of internal and external motives inducing to activities for preserving health and conditions promoting realization of health-preserving behavior [3].

A considerable number of national scientific articles are devoted to motivation to healthy lifestyle among young people (students). In most of these publications it is appealed to a low wellness principles competence among youth and insufficient awareness.

The factors like weak awareness on the role of proper nutrition, daily routine and physical education in health-promoting of the body, unfavorable impact of harmful habits on the body, as well as unwillingness of youth to self-health-promotion and weak motivation to health-promoting activities are not of less importance [4-7 and others].

The mentioned factors also concern motivation to physical activities in a way determined as a special state of a personality aimed at achieving optimal level of physical fitness and functionality [8].

At the same time new forms of physical sessions and searching for the



new ways of increasing motivation to healthy lifestyle gain a great importance in motivation concern [9, 10, 11].

Motivation to health among sick people is less studied. A low patients' motivation to treatment and fighting diseases and refusing to take responsibility for their health state having a considerable impact on the treatment results are indicated [12].

The researchers state that people rather do what they like more. Treating health usually have the following features: before there is a serious disease, a person is not imbued with their own health [13].

Forming motivation to recovery becomes important not only under conditions of stress that can be caused by an disease [14]. However, there is data indicating that the sick can have a low level of motivation to preserving level and healthy lifestyle. Thus, among employees of coal mining industry with work-related disorders a low level of motivation to recovery and preserving health prevails compared to employees unpreoccupied in harmful working conditions among which a high degree of motivation to health and healthy lifestyle is determined [15].

Understanding the importance of motivation in leading healthy lifestyle and preserving health is still controversial. Some researchers indicate an important role of motivation in forming human health, even more than some risk factors for development of diseases [16]. For their part, K.F. Carter et al. [17] consider motivation not a very considerable factor determining behavior in the sphere of healthcare.

The hypothesis of the research

consisted in stating that functional capabilities of a person are considerably related to the level of motivation to health.

The **aim of the research** is to determine the level of motivation to health among sick and healthy people and examine its relationship with cardiorespiratory system's biodemographic and anthropometric characteristics as well as its functional state.

Material and methods.

Participants of the research. The research was conducted among the patients with chronic diseases and trauma consequences requiring medical rehabilitation in hospital as well as among the students of a humanitarian university being healthy people by medical reports.

The criteria of including into research are: the age of the examined from 17 to 79 years old, inclusive; the patients having any chronic disease or trauma with consequences for health; the young people being students of a humanitarian university not having any chronic diseases or traumas with consequences for health.

In total 577 people were selected and examined including 317 men (54.94%) and 260 women (45.06%).

The average age of the examined constituted ($M \pm S$) 34.95 ± 17.71 (95% confidence interval: 33.50–36.40) years old. The examined were divided by age periods the following way: less than 20 years old – 148 (25.65%), 20–29 years old – 149 (25.82%), 30–39 years old – 61 (10.57%), 40–49 years old – 86 (14.90%), 50–59 years old – 56 (9.71%), 60–69 years old – 48 (8.32%), 70–79 years old – 27 (4.68%). 353 patients in total (61.18%), 224 students



(38.82%).

All the examined gave their informed consent on participation in the research. The protocol of the research was considered and resolved at the gathering of the commission in ethical issues of the Faculty of health, physical education and sport of Borys Grinchenko Kyiv University.

The research fully complies with the principles of Helsinki Declaration of International Medical Association «Ethical principles for medical researches involving a human as an object of the research».

Organization (design) and methods of the research. A single center, prospective, cross sectional, sample, and observation research was conducted. The research was realized during the years 2018–2019. The examination of the selected people was conducted on their consent via surveying and measuring anthropometric and functional indicators. The survey was conducted a single time in the form of providing answers to the questions of special questionnaires in the presence of a researcher.

Anthropometric methods measured the height and body mass. The cardiorespiratory system's functional state was assessed by integral functional indicators calculated based on anthropometric and routine indicators characterizing the function of blood circulation and respiratory organs.

The assessment of the function of blood circulation and respiratory organs among the examined was conducted by the following indicators: heart rate at rest, frequency of respiratory moves, arterial systolic and

diastolic blood tension, vital capacity measured with dry portable spirometer DPS, duration of breath-holding after a deep inhalation, and duration of breath-holding after a deep exhalation. Also wrist muscle force was measured with a wrist dynamometer ДК-100 as well as duration of static balance.

Using the results of the mentioned measurements calculated the integral functional indicators like adaptation potential of blood circulation system (APBS) following A. Berseneva [18], the functional state level (FSL) following O. Pyrohova [19], birth-death ratio (BDR) [20], Skibinski's index (SI) [21], Kerdo index (KI) [22], and wrist force index (WFI) were calculated [23].

By the APBS value, the following conclusions were given: satisfactory adaptation potential, tension of adaptation mechanisms, dissatisfactory adaptation potential, and failure of adaptation mechanisms.

FSL was assessed in accordance with the gender of the examined and using the following gradations: low, lower than medium, medium, higher than medium, and high.

By the BDR value and considering the gender of the examined, the conclusion was made on the degree of compliance of the respiratory function with body mass: full compliance, slight incompliance, and considerable incompliance.

By the SI value, the conclusion was made on respiratory organs and blood circulation harnessing together using the following scale: bad, dissatisfactory, satisfactory, good, and excellent harnessing together of respiratory organs and blood circulation.



Depending on the KI value, the decision was made on the degree of the vegetative tone disorder: normal tone (eutonia), slightly disordered tone, considerably disordered tone. Provided that KI has a positive value, such changes are common for the sympathetic region, and provided that it is negative – the parasympathetic region of the vegetative nervous system.

WFI characterized a relative wrist force, was measured in percentage, and interpreted considering the gender of the examined. To assess this indicator we have introduced five gradations, which comply with the following conclusions: low relative force, relative force lower than medium, medium relative force, relative force higher than medium, and high relative force.

Motivation to health was studied by the option of a short survey in Russian to determine Recovery Locus of Control [24] based on consideration of the responder's opinion on their own role in recovery. In the preamble of the survey, the need of choosing the answer to each question complying with the point of view on their own health was indicated. There were 9 such questions. The answers were marked in points in accordance with a special methodology. Afterwards the total of points was determined. The total of points could vary from 0 to 36. High points were declarative of the high motivation level to improving their own health state and vice versa.

We have conducted scaling of numeric values of the testing result into four gradations with the following conclusions on the level of motivation: 0-9 points – very low motivation level, 10-18 points – low motivation level,

19-27 points – medium motivation level, 28 points and higher – high motivation level.

The observation of the examined and further work required impersonation of the gained materials.

Statistical analysis. The size of the sample was not preliminarily calculated. The statistical characteristics of the sample were provided via finding the mean average (M) and its standard deviation (S).

Quality binary indicators of the samples were compared via checking the p-value on the equality of shares expressed in percentage, and ordinal values – via calculating the Pearson's fitting criterion xi-square (χ^2) with Yates's correction for continuity.

The relationship between the values of indicators was found via building the tables of harnessing together by the analysis of which the conclusion was made on association of the examined features.

The level of significance with indicating the probability of rejecting the p-value (p) by mistake served as a significance criterion of statistical assessments, the value 0.05 was taken as a threshold level.

Processing the research data was completed by means of software product SPSS Statistics Base (IBM Company, USA).

Results of the research. The allocation of the levels of motivation to health among the examined is given in the fig. 1. Among most of the examined – 55.11% (318/577) the medium motivation level was identified. The next level by the quantity of the identified cases is the high motivation level – 38.65% (223/577). Among the examined there

was not recorded very low motivation level. The low motivation level is

inherent only for 6.24% (36/577) of the examined.

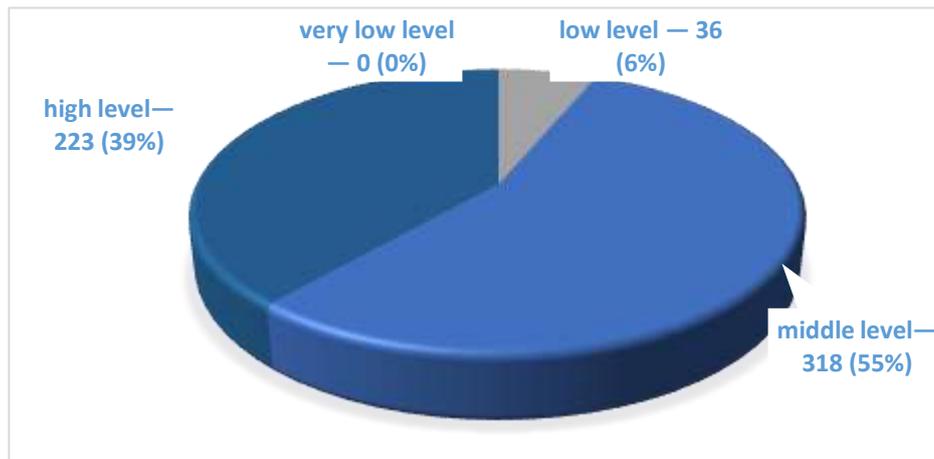


Figure 1. Allocation of the levels of motivation to health among the examined (quantity, %)

The allocation of the levels of motivation to health depending on the gender of the examined is given in the table 1.

No relationship between motivation to health and gender of the examined was found.

Table 1

Allocation of the levels of motivation to health depending on the gender of the examined

($\chi^2 = 2.47, p = 0.2902$)

Motivation levels	Men (n=317)		Women (n=260)	
	n	%	n	%
low	21	6.62	15	5.77
medium	183	57.73	135	51.92
high	113	35.65	110	42.31

In the table 2 the conclusions on motivation to health depending on the age of the examined are given. It is worth noting that among the people of elderly age (more than 59 years old) the low motivation level was found more often – 216.42% (11/67). It is statistically significant compared to the people younger than 18 years old – such level was not recorded at all (0/56)($p < 0.01$).

The age of 18-44 years old constituted 5.66% (18/345)($p < 0.05$)

and 45-59 years old – 5.22% (6/106)($p < 0.01$). Also for the people of the elderly age (more than 59 years old) a greater quantity of the medium motivation level is inherent – 64.18% (43/67) and it significantly differed from the examined younger than 18 years old – 42.86% (24/56)($p < 0.05$).

For their part, the young people before 18 years old had the greatest quantity of the high motivation level – 57.14% (32/56), which was considerably higher than among the



examined aged more than 59 years old – 19.4% (13/67)($p<0.0001$), 45-59 years old – 33.96% (36/106)($p<0.01$),

and 18-44 years old – 40.87% (141/345)($p<0.05$).

Table 2

Allocation of the levels of motivation to health depending on the age of the examined

($\chi^2 = 31.14, p = 0.00000$)

Motivation levels	Age periods by the WHO							
	< 18 years old (n=56)		18-44 years old (n=345)		45-59 years old (n=106)		> 59 years old (n=67)	
	n	%	n	%	n	%	n	%
low	0	0	18	5.22	6	5.66	11	16.42
medium	24	42.86	186	53.91	64	60.38	43	64.18
high	32	57.14	141	40.87	36	33.96	13	19.40

The analysis of the relationship between motivation to health and body lengths among the examined did not

identify any dependence for these indicators (table 3).

Table 3

Allocation of the levels of motivation to health depending on the body lengths among the examined ($\chi^2 = 4.78, p = 0.5718$)

Motivation levels	Body length							
	< 160 cm (n=26)		160-169 cm (n=140)		170-179 cm (n=194)		> 179 cm (n=127)	
	n	%	n	%	n	%	n	%
low	2	7.69	8	5.71	13	6.70	11	8.66
medium	10	38.46	80	57.14	113	58.25	71	55.91
high	14	53.85	52	37.14	68	35.05	45	35.43

In the course of analyzing the relationship between motivation to health and body masses of the examined a considerable privilege of the quantity of low motivation level was found among the people with body mass 90-99 kg – 13.95% (6/43) – compared to the people having body mass lower than 60 kg – 3.49% (3/86) ($p<0.05$). For the people with body mass lower than 60 kg a greater quantity of high motivation level is common – 53.49% (46/86) which

considerably differed from the people with body mass 60-69 kg – 39.34% (48/122) ($p<0.05$), 80-89 kg – 28.97% (31/107) ($p<0.01$), 90-99 kg – 30.23% (13/43) ($p<0.01$), and over 99 kg – 18.18% (4/22) ($p<0.01$).

Also the greatest quantity of medium motivation level was identified among the people with body mass over 99 kg – 77.27% (17/22) and this was considerably more compared to the people having body mass lower than 60 kg – 43.02% (37/86) ($p<0.01$) (table 4).

Table 4

Allocation of the levels of motivation to health depending on the body masses of the examined ($\chi^2 = 22.15, p = 0.0143$)

Motivation levels	Body mass											
	< 60 kg (n=86)		60-69 kg (n=122)		70-79 kg (n=108)		80-89 kg (n=107)		90-99 kg (n=43)		> 99 kg (n=22)	
	n	%	n	%	n	%	n	%	n	%	n	%
low	3	3.49	8	6.56	9	8.33	7	6.54	6	13.95	1	4.55
medium	37	43.02	66	54.10	62	57.41	69	64.49	24	55.81	17	77.27
high	46	53.49	48	39.34	37	34.26	31	28.97	13	30.23	4	18.18

Also the relationship between motivation to health among the examined and their cardiorespiratory system's functional state was studied being assessed with integral indexes.

Initially to find the relationship between the state of motivation to health and adaptation potential of the blood circulation system following A. Berseneva the examined having gained the results «failure of adaptation mechanisms» were united in one group with the examined having gained the results «dissatisfactory adaptation potential» as the quantity of the first was not high (table 5).

It was identified that the low motivation level was recorded more often under condition of dissatisfactory adaptation potential and failure of adaptation mechanism – 15.69% (8/51). It was statistically significantly higher compared to satisfactory adaptation potential – 2.55% (4/157) ($p < 0.001$). Also under condition of dissatisfactory adaptation potential and failure of adaptation mechanisms a greater quantity of the medium motivation level was found – 68.63% (35/51) – compared to satisfactory adaptation potential such

indicator appeared to be statistically significant – 45.22% (71/157) ($p < 0.001$).

The quantity of medium motivation level in the course of tensioning the adaptation mechanisms – 61.83% (162/262) – considerably prevailed the quantity of this indicator under condition of satisfactory adaptation potential – 45.22% (71/157) ($p < 0.001$).

In the course of satisfactory adaptation potential a greater quantities of the high motivation level – 52.23% (82/157), which significantly differs compared to dissatisfactory adaptation potential and in the course of failure of adaptation mechanisms – 15.69% (8/51) ($p < 0.001$) as well as with tensioning of adaptation mechanisms – 30.92% (81/262) ($p < 0.001$) were found (table 5).

The low motivation level was mostly identified among those with the low level of physical state following O. Pyrohova – 14.04% (8/57), compared to the level higher than medium – 4,85% (5/103) and high level of physical state – 4.38% (7/160). It was considerably more ($p < 0.05$ for both cases of comparison).



Table 5

Allocation of the levels of motivation to health depending on adaptation potential of the blood circulation system following A. Berseneva among the examined ($\chi^2 = 35.55$, $p=0.00000$)

Motivation levels	Adaptation potential of the blood circulation system					
	Satisfactory (n=157)		Tensioning of adaptation mechanisms (n=262)		Dissatisfactory and failure of adaptation mechanisms (n=51)	
	n	%	n	%	n	%
low	4	2.55	19	7.25	8	15.69
medium	71	45.22	162	61.83	35	68.63
high	82	52.23	81	30.92	8	15.69

The greatest quantity of the high motivation level was found under condition of high level of physical state – 46.88% (75/160), which is statistically significantly higher than of the one with the level lower than medium – 30.00% (15/50) ($p<0.05$) and the one with low level of physical state of the examined – 21.05% (12/57) ($p<0.001$).

The gained tendency consists in the fact that the medium motivation level was recorded more often among the people with higher than medium, lower than medium, and low levels of physical state – 63.11-64.91%, and the least one – among the people with high motivation level – in 48.75% of cases (table 6).

Table 6

Allocation of the levels of motivation to health depending on the level of the physical state following O. Pyrohova among the examined

($\chi^2 = 20.06$, $p=0.0101$)

Motivation levels	Levels of physical state									
	High (n=160)		Higher than medium (n=103)		Medium (n=102)		Lower than medium (n=50)		Low (n=57)	
	n	%	n	%	n	%	n	%	n	%
low	7	4.38	5	4.85	8	7.84	3	6.00	8	14.04
medium	78	48.75	65	63.11	58	56.86	32	64.00	37	64.91
high	75	46.88	33	32.04	36	35.29	15	30.00	12	21.05

In the course of the analysis of interrelationship between motivation to health among the examined and their birth-death ratio the least quantity of its medium level under condition of full compliance of the respiratory function

with body mass was identified – 50.82% (121/238). It is statistically significantly lower compared to a slight incompliance – 61.69% (95/154) ($p<0.05$) and considerable incompliance of respiratory function



with body mass – 69.23% (18/26).

Under conditions of full compliance of respiratory function with body mass the high motivation level was recorded more often – 43.28% (103/238). It is considerably higher

compared to a slight incompliance – 29.22% (45/154) ($p < 0.01$) and considerable incompliance by birth-death ratio – 23.08% (6/26) ($p < 0.001$) (table 7).

Table 7

Allocation of the levels of motivation to health depending on birth-death ratio among the examined ($\chi^2 = 10.62, p = 0.0310$)

Motivation levels	Compliance of the respiratory function with body mass					
	Full compliance (n=238)		Slight incompliance (n=154)		Considerable incompliance (n=26)	
	n	%	n	%	n	%
low	14	5.88	14	9.09	2	7.69
medium	121	50.84	95	61.69	18	69.23
high	103	43.28	45	29.22	6	23.08

For finding the relationship between the state of motivation to health among the examined with the Skibinski's index results «bad harnessing together», they were united with the group of the examined with the results «satisfactory harnessing together» because of the little quantity of the first (table 8).

There was no relationship identified between these indicators. Also there was no harnessing together between motivation state and health among the examined with consistency of respiratory organs' activity and blood circulation by the Hildebrandt coefficient and with the state of vegetative tone by the Kerdo index (tables 9 and 10).

Table 8

Allocation of the levels of motivation to health depending on Skibinski's index among the examined ($\chi^2 = 4.05, p = 0.6689$)

Motivation levels	Respiratory organs' activity and blood circulation harnessing together							
	Bad and dissatisfactory (n=24)		Satisfactory (n=169)		Good (n=168)		Excellent (n=48)	
	n	%	n	%	n	%	n	%
low	3	12.50	11	6.51	12	7.14	1	2.08
medium	14	58.33	97	57.40	97	57.74	26	54.17
high	7	29.17	61	36.09	59	35.12	21	43.75



Table 9

Allocation of the levels of motivation to health depending on Hildebrandt coefficient among the examined ($\chi^2 = 8.73$, $p = 0.3653$)

Motivation levels	Consistency of the respiratory organs' activity and blood circulation					
	Consistent (n=345)		Slight inconsistency (n=72)		Considerable inconsistency (n=25)	
	n	%	n	%	n	%
low	25	7.25	3	4.17	3	12.00
medium	200	57.97	39	54.17	11	44.00
high	120	34.78	30	41.67	11	44.00

Table 10

Allocation of the levels of motivation to health depending on Kerdo index among the examined ($\chi^2 = 4.74$, $p = 0.3141$)

Motivation levels	Vegetative tone state					
	Normal (n=127)		Slight disorder (n=296)		Considerable disorder (n=51)	
	n	%	n	%	n	%
low	5	3.94	21	7.09	6	11.76
medium	71	55.91	170	57.43	30	58.82
high	51	40.16	105	35.47	15	29.41

Among the examined having small relative force by the wrist force index the least quantity of the high motivation level was recorded – 26.53% (26/98) differing from the examined with force higher than medium – 45.61% (26/57)($p < 0.05$) and high relative force – 47.87% (45/94)($p < 0.01$) among which this motivation level was recorded more

often.

The medium motivation level was prevailing in quantity among the people with small relative force – 66.33% (65/98). This indicator is higher than among the people having higher than medium – 47.37% (27/57)($p < 0.05$) and great relative wrist force – 50.00% (47/94)($p < 0.05$).

Table 11

Allocation of the levels of motivation to health depending on wrist force index among the examined ($\chi^2 = 16.82$, $p = 0.0319$)

Motivation levels	Value of relative wrist force									
	Small (n=98)		Lower than medium (n=94)		Medium (n=59)		Higher than medium (n=57)		Great (n=94)	
	n	%	n	%	n	%	n	%	n	%
low	7	7.14	11	11.70	4	6.78	4	7.02	2	2.13
medium	65	66.33	52	55.32	33	55.93	27	47.37	47	50.00
high	26	26.53	31	32.98	22	37.29	26	45.61	45	47.87



Discussing the results of the research.

Generalizing the gained results and using only statistically significant data it is possible to state that among the examined sick and healthy people the medium level of motivation to health prevailed – 55.11% (318/577). The next by the quantity of identified cases is high motivation level – 38.65% (223/577).

No relationship was identified between the level of motivation to health and the gender of the examined though it was related to their age: for the young people (less than 18 years old) the high motivation level is inherent, and for the elderly people (60 years old and more) – the low and medium motivation levels.

Among the people with body mass lower than 60 kg the high level was common, and among the people with body mass 100 kg and more – the medium motivation level. Motivation is not related to the height of the examined.

Also the relationship between motivation to health among the examined and their cardiorespiratory system's functional state was studied, and the following patterns were established:

- a greater quantity of the high motivation level was identified under conditions of satisfactory adaptation potential, and the low and greater quantity of the medium motivation level were recorded under conditions of dissatisfactory adaptation potential and failure of adaptation mechanisms;

- the high motivation level was defined the most often under conditions of the high level of physical state, and

the low level – under conditions of the low level of physical state following O. Pyrohova;

- the high motivation level was recorded the most often under conditions of full compliance, and the greatest quantity of the medium motivation level was defined in the course of considerable incompliance of respiratory function and body mass with birth-death ratio;

- no relationship between motivation and harnessing together of respiratory organs' activity and blood circulation by Skibinski's index as well as between consistency of respiratory organs' activity and blood circulation by Hildebrandt coefficient.

It was also found than motivation to health is related to relative wrist force of the examined – the high motivation level was defined the most often among the people with wrist force higher than medium and great one, and the medium motivation level prevailed by quantity among the people with small relative force.

Finally, we did not define any relationship between the state of motivation to health among the examined and the vegetative tone state by Kerdo index.

Consequently, we can state that young people (less than 18 years old) and people with small body mass (lower than 60 kg) are more motivated to support their health or to recovery if there is any illness. The people with high motivation level have a satisfactory adaptation potential, high level of physical state (following O. Pyrohova), full compliance of respiratory function with body mass by birth-death ratio, and medium or high



relative wrist force.

Further research of allocations of the levels of motivation to health among sick and healthy people approved the privilege of the high motivation level among healthy people – 53.13% (119/224) and medium

motivation level among sick people – 62.04% (219/353). Also for sick people the existence of a greater quantity of low motivation level is inherent – 9.06% (32/353) compared to healthy people – 1.79% (4/224) (table 12).

Table 12

Allocation of the levels of motivation to health among sick and healthy people

Motivation levels	Sick people (n=353)		Healthy people (n=224)		Level of statistical significance
	n	%	n	%	
low	32	9.06	4	1.79	p < 0.001
medium	219	62.04	101	45.09	p < 0.001
high	102	28.90	119	53.13	p < 0.001

The data on the relationship between the motivation level to health and the age gained by us complies with the research results by J.Rapolienė et al. [25] reporting on considerably lower level of intrinsic motivation to recovery of their health among the patients of elderly age suffering from brain stroke compared to the patients of younger age. It became apparent especially vividly at the beginning of such patients' rehabilitation.

L. Orekhova and co-authors [26] found the relationship between the patients' personal characteristics and their attitude to individual oral hygiene. The people with internal locus control treated oral health carefully, and the people with external locus control paid less attention to oral health. Similar data was given by Y. Chapliieva and I. Starikova [27] pointing out to the existence of relationship between motivation and getting dental aid.

If we speak about specific relationship between motivation to health and functional capabilities or

state of a person's physical health, there is no such data in scientific literature. Here we can appeal to research work about the relationship between the indicator of glycosylated hemoglobin and a sick person's awareness of diabetes: the higher the awareness is, the better the indicator of carbohydrate metabolism compensation is [12].

Consequently, the results of our research let us state that there is a considerable relationship between a person's motivation to health and their age, body mass, and their functional capabilities (their cardiorespiratory system's state). We join the community of scientists considering that motivation is an important psychological and social factor having a direct impact on a person's health state [28]. We should also mention the need in forming a positive motivation and volitional regulation to support their own health here [29].



Conclusions:

1. Among the sick and healthy examined people the medium level of motivation to health prevails – 55.11% (318/577). The next level by the quantity of defined cases is the high one – 38.65% (223/577) and the low one is 6.24% (36/577). There is no very low motivation level recorded.

2. Among the healthy people (student youth) the high level of motivation to health prevails – 53.13% (119/224), and among the sick people the medium motivation level is recorded the most often – 62.04% (219/353). For the sick people a greater quantity of the low motivation level was inherent – 9.06% (32/353) compared to the healthy individuals – 1.79% (4/224).

3. The relationship between the level of motivation to health and a person's age (for the young people the high motivation level is inherent, and for the elderly people – the low and medium motivation levels), and their body mass

(for the people with body mass lower than 60 kg the high level is common, and for the people with body mass 100 kg and more – the medium motivation level).

4. The relationship between a person's level of motivation to health and their cardiorespiratory system's functional state was found having been revealed in privilege of its high level under conditions of satisfactory adaptation potential, high level of physical state, and full compliance of respiratory function with body mass. Also the privilege of the high level of motivation to health was identified among the people with wrist force being higher than medium and great relative one.

Prospects for further research.

Further, it is prospective to study the relationship between motivation to health and indicators characterizing the state of physical, spiritual, and social health of a person.

References:

1. Nemov RS. Psychology. Ucheb. dlia stud. vyssh. ped. ucheb. zavedeniy: In 3 books. 4thed. Moscow: Gumanit. izd. tsentr VLADOS, 2003. Kn. 1: General foundations of psychology. 688 p. *Russian*
2. Zub AT. Psychology of management. Uchebnik i praktikum dlia akademicheskogo bakalavriata. 2nd ed. Moscow: Izdatel'stvo Iurayt, 2019. 372 p. *Russian*
3. Karaseva TV, Ruzhenskaya YeV. The characteristics of motivation to follow healthy life-style. *Problemy sots al'noy gigieny, zdravookhraneniia i istorii meditsiny*. 2013;5:23-24. Available from: <https://cyberleninka.ru/article/n/osobennosti-motivatsii-vedeniya-zdorovogo-obraza-zhizni/viewer>. *Russian*
4. Povar OV. Motivational-Value Attitude of Students at Universities Towards Physical Education and Sport. *Fizychnykhovannia, sport i kul'tura zdorov'ia u suchasnomu suspil'stvi*. 2012;1:50-55. *Ukrainian*
5. Banshchikov AG. The influence of motivation on the motor activity of students in physical education classes. In: Peshkova NV, Busheva ZhI, Akhtemzianova NM., editors. *Sbornik materialov II Regional'noy nauchno-prakticheskoy konferentsii. Studencheskiy sport: sostoianie i perspektivy razvitiia*; 2019 Sep 28; Surgut. Surgut; 2019:8-11. Available from: <https://www.elibrary.ru/item.asp?id=41260909&pff=1>. *Russian*



6. Kalachev GA, Egorov IN. Study of the health level of students of a teacher training college and their attitude to their own health. *Vestnik Barnaul'skogo gosudarstvennogo pedagogicheskogo universiteta*. 2008;8(1):62-67. *Russian*
7. Grinchenko V.S., Ageeva N.A. Formation of motivation for physical education and sports among students. In: *Materialy IV Vserossiyskoy nauchno-prakticheskoy konferentsii s mezhdunarodnym uchastiem. Aktual'nye voprosy estestvoznaniia*; 2019 March 25; Ivanovo. Ivanovo: Izdatel'stvo: Ivanovskaia pozharno-spasatel'naia akademiia; 2019:292-296. Available from: <https://www.elibrary.ru/item.asp?id=42435951>. *Russian*
8. Belyanicheva VV, Gracheva NV. Formation of motivation to physical trainings at students. *Physical culture and sport: science and practice integration*. Interuniversity collection of scientific article. Vol. 2. Saratov: OOO Izd-y tsentr «Nauka»; 2009:14-20. *Russian*
9. Hloba HV. The influence of the method of application of combined aerobics in the process of physical education classes of primary school students on their health. *Slobozhan. nauk.-sport. visnyk*. 2011;3:7-11. *Ukrainian*
10. Skurikhina NV, Kudryavtsev MD, Struchkov VI, Maslov SV. Evaluation of the effectiveness of the motivation to lead healthy lifestyles in students of special medical groups involved in fitness-yoga. *Modern high technologies*. 2016;3:406-409. *Russian*
11. Kozulko AN. Motivation formation for physical-health-improving lessons. *Pedagogiko-psikhologicheskie i mediko-biologicheskie problemy fizicheskoy kul'tury i sporta*. 2019;14(1):113-119. DOI:10.14526/2070-4798-2019-14-1-113-119. *Russian*
12. Budreyko OA, Kyrylova OO, Chumak SO. Comprehensive assessment of motivation for self-control in adolescents with type 1 diabetes mellitus. *Ukr. zhurnal dytiachoi endokrynolohii*. 2018;2:75-84. *Ukrainian*
13. David M. Williams, Ryan E. Rhodes. The confounded self-efficacy construct: conceptual analysis and recommendations for future research. *Health Psychol Rev*. 2016 Jun; 10(2):113-28. DOI: 10.1080/17437199.2014.941998
14. Popenko NV. Features of motivation of patients with acute cerebrovascular accident. *Teoriia i praktika sovremennoy nauki*. 2016;10(16):344-348. *Russian*
15. Danilov IP, Vlakh NI, Gugushvili MA, Paneva NY, Logunova TD. Motivation for health and healthy lifestyle in workers of aluminum and coal industry. *Occupational medicine and industrial ecology Meditsina truda i promyshlennaya ekologiya*. 2019;59(6): 330-334. DOI: 10.31089/1026-9428-2019-6-330-334. *Russian*
16. Wiesemann A, Ludt S, Szecsenyi J, Scheuermann W, Scheidt R. Cardiovascular risk factors and motivation for a healthy life-style in a German community-results of the GP-based Oestringen study. *Patient Educ Couns*. 2004 Oct; 55(1): 40-7. DOI: 10.1016/j.pec.2003.07.002.
17. Carter KF, Kulbok PA. Motivation for health behaviours: a systematic review of the nursing literature. *J Adv Nurs*. 2002 Nov; 40(3): 316-30. DOI:10.1046/j.1365-2648.2002.02373.x
18. Baevsky RM, Berseneva AP Assessment of the adaptive capacity of the organism and the risk of developing diseases. Moscow: Medicina, 1997. 240 p. *Russian*
19. Pirogova EA. Improving the physical condition of a person. K.: Zdorov'ya; 1989. 164 p. *Russian*
20. Solodkov AS, Sologub EB. Human physiology. General. Sports. Age (Uchebnoe



- posobie). Moscow: Sovietskiy sport; 2003. 480 p. *Russian*
21. Oshevsky LV, Krylova EV, Ulanova EA. Study of human health by functional indicator of the body (metod. ukazaniya). Nizhniy Novgorod; 2007. 67 p. *Russian*.
22. Wayne AM, editor. Vegetative disorders: clinical picture, treatment, diagnosis: a guide for doctors. Moscow: Meditsinskoye informatsionnoye agentstvo; 2003. 752 p. *Russian*
23. Boychuk T, Golubuva M, Levandovskiy O, Voychishin L. Fundamentals of diagnostic dosages for physical rehabilitation: a master book for students of the first-class mortgages. L.: ZUKTS; 2010. 240 p. *Ukrainian*.
24. Belova AN, editor. Scales, tests and questionnaires in medical rehabilitation. Moscow: Antidor; 2002. 440 p. *Russian*
25. Rapolienė J., Endzelytė E., Jasevičienė I., Savickas R. Stroke Patients Motivation Influence on the Effectiveness of Occupational Therapy. *Rehabil Res Pract*. 2018 Jul 30; 2018:9367942.
DOI: 10.1155/2018/9367942.
26. Orekhova LYu, Kudryavtseva TV, Isaeva ER, Tachalov VV, Loboda ES, Sitkina EV. Interrelation of personal characteristics and characteristics of individual care for the mouth cavity. *Treatment and prevention*. 2017;1(21): 74-79. *Russian*
27. Chaplieva EM., Starikova IV. Revealing the reasons for unmotivated attitude to the preservation of dental health in young people. *Colloquium-journal*. 2019;19-2(43):63-65. *Russian*
28. Vasilenko IV, Borovkova OE. The mechanism of the impact of social factors on human health. *Society: sociology, psychology, pedagogy*. 2016;3:14-20. *Russian*
29. Minkh EA. The role of motivation and volitional regulation in maintaining a healthy lifestyle. In: Sbornik nauchnykh trudovuchastnikov IV mezhvuzovskoy nauchno-prakticheskoy konferentsii. Aktual'nyye problemy psikhologii i pedagogiki v sovremennom mire; 2019 April 04. Moscow: Izdatel'stvo: Rossiyskiy universitet druzhby narodov; 2019:307-313. Available from: <https://www.elibrary.ru/item.asp?id=38192773>. *Russian*

The authors claim no conflict of interests.

Authors' information:

Valentyn SAVCHENKO

doctor of medical sciences, professor

chief of the department of physical rehabilitation and biokinesiology,

Borys Grinchenko Kyiv University, Kyiv, Ukraine

ORCID: 0000-0002-8483-9748

E-mail: v.savchenko@kubg.edu.ua

Olesia TYMCHYK

candidate of biological sciences, assistant professor

of the department of physical rehabilitation and biokinesiology,

Borys Grinchenko Kyiv University, Kyiv, Ukraine

ORCID: 0000-0002-8283-9348

E-mail: o.tymchyk@kubg.edu.ua

**Yevheniia NEVEDOMSKA**

candidate of pedagogical sciences, assistant professor
of the department of physical rehabilitation and biokinesiology,
Borys Grinchenko Kyiv University, Kyiv, Ukraine
ORCID: 0000-0002-7450-3562
E-mail: y.nevedomska@kubg.edu.ua

Iryna OMERI

candidate of biological sciences, assistant professor
of the department of physical rehabilitation and biokinesiology,
Borys Grinchenko Kyiv University, Kyiv, Ukraine
ORCID: 0000-0001-6773-4146
E-mail: i.omeri@kubg.edu.ua

Olha BURIAK

senior lecturer
of the department of physical rehabilitation and biokinesiology,
Borys Grinchenko Kyiv University, Kyiv, Ukraine
ORCID: 0000-0001-7074-5743
E-mail: o.buriak@kubg.edu.ua

Halyna KHARCHENKO

candidate of sciences in physical education and sport, assistant professor
of the department of physical rehabilitation and biokinesiology,
Borys Grinchenko Kyiv University, Kyiv, Ukraine
ORCID: 0000-0002-9281-7338
E-mail: h.kharchenko@kubg.edu.ua

Svitlana YATSENKO

senior lecturer
of the department of physical rehabilitation and biokinesiology,
Borys Grinchenko Kyiv University, Kyiv, Ukraine
ORCID: 0000-0001-8609-0120
E-mail: s.yatsenko@kubg.edu.ua

The article received December 14, 2020

Savchenko Valentyn, Tymchyk Olesia, Nevedomska Yevheniia, Omeri Iryna, Buriak Olha, Kharchenko Halyna, Yatsenko Svitlana. Health motivation and its relationship with cardio-respiratory system's biodemographic and anthropometric characteristics as well as functional state among sick and healthy people. *Sports Science and Human Health*. 2021; 1(5):94-110. DOI:10.28925/2664-2069.2021.19