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Original article

PHYSICAL ACTIVITY LEVEL ASSESSMENT OF POPULATION GROUPS IN THE NOVOSIBIRSK REGION

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The paper is devoted to assessing the level of physical activity of some population groups. Researching the level of physical activity of the population in the conditions of the physical, social and economic environment surrounding it, without taking into account direct sports, provides an important tool that serves to integrate the efforts of interdepartmental interaction in the implementation of federal and regional programs aimed at improving the health of citizens. The research was conducted using the International Physical Activity Questionnaire (IPAQ). The purpose of the research was to assess the level of physical activity and the degree of motivation to change it among the region's adult population in the conditions of changing hiking to driving a car. Surveys on the level of physical activity were conducted on an anonymous, voluntary basis. The research results showed that about a third of respondents experienced a constant lack of movement and confirmed that the adult population pays insufficient attention to the simplest preventive measures to improve their health, one of which is physical activity.

Keywords: *physical activity; sedentary lifestyle; physical inactivity; lifestyle change; motivation to lead an active lifestyle; IPAQ*

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Научная статья

ОЦЕНКА УРОВНЯ ФИЗИЧЕСКОЙ АКТИВНОСТИ ГРУПП НАСЕЛЕНИЯ НОВОСИБИРСКОЙ ОБЛАСТИ

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Статья посвящена оценке уровня физической активности некоторых групп населения. Исследование уровня физической активности населения в

условиях окружающей его физической, социальной и экономической среды, без учета непосредственно занятий спортом, предоставляет важный инструмент; он служит интеграции усилий межведомственного взаимодействия при реализации федеральных и региональных программ, направленных на улучшение здоровья граждан. Исследование проводилось с использованием Международного опросника физической активности (IPAQ). Целью исследования была оценка уровня физической активности и степени мотивации к ее изменению среди взрослого населения региона в условиях смены пешего туризма на вождение автомобиля. Опросы об уровне физической активности проводились на анонимной, добровольной основе. Результаты исследования показали, что около трети респондентов испытывали постоянную нехватку движения, и подтвердили, что взрослое население уделяет недостаточное внимание простейшим профилактическим мерам для улучшения своего здоровья, одним из которых является физическая активность.

Ключевые слова: физическая активность; сидячий образ жизни; мало-подвижный образ жизни; изменение образа жизни; мотивация вести активный образ жизни; IPAQ

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Introduction

Taking into account the fact that adequate physical activity alone (moderate activity for 30 minutes daily), regardless of other risk factors, helps to reduce the risk of developing cardiovascular disease. It has a positive effect on human metabolism, reduces blood pressure, improves sleep and overall well-being [2; 3; 25; 27; 28; 29; 30; 31; 32], significantly improves the quality of life, and contributes to a favorable prognosis of the course of chronic diseases. This shows the constant demand for studying and evaluating the level of physical activity of the population of different age and gender groups.

Until the middle of the last century, lack of physical activity was never a public health problem. However, with the development of science and technology, a sedentary lifestyle has become an increasing problem, and today it has acquired the status of a scourge of civilization. The spread of hypodynamia is associated with the predominant substitution of physical labor by mental activity, active leisure, manual creativity (knitting, sewing, embroidery, other crafts),

reading, watching videos and TV, as well as a high level of urbanization and digitalization, accelerating the pace of life, information exchange, which force one to change walking and cycling to excessive use of motor vehicles, both public and personal, and the descent and ascent from floor to floor is now often done with the help of an elevator: a people immediately enter their workplace is located, and in conditions of isolation and change of work mode to remote, for example, due to the COVID-19 pandemic, they may not leave the house at all.

Several environmental factors associated with urbanization can prevent people from increasing their physical activity levels [4; 5; 6; 7; 8]: fears of violence and crime on the streets; heavy traffic; poor air quality, air pollution; lack of parks, sidewalks, and sports facilities.

Taking the aggressiveness of physical inactivity into account as a health risk factor, the research on measuring human physical activity and developing preventive programs to reduce the risk of developing chronic non-communicable diseases [13] was continuously carried out for more than 50 days. One of the major epidemiological studies of recent years is the Prospective Urban and Rural Epidemiological Study [PURE]. In the PURE study, it was found that the risk of mortality due to cardiovascular pathology had an inverse correlation with the level of regular physical activity [25].

At the first stage, the task of such studies was to assess the risk of cardiovascular events at the height of the load [8], and later the leading goal was to study the phenomenon of adaptation to physical exercise as a preventive measure and to determine the optimal characteristics of the load.

Over time, methodological approaches to assessing the intensity and duration of physical exercises have changed—from subjective methods based on diaries and questionnaires [9; 13; 14] to modern mobile devices - pedometers and accelerometers, which was reflected in the change in recommendations for physical activity [6]. To date, the recommendations of the World Health Organization of 2010 are considered internationally recognized, but many more issues remain unresolved in this area due to the lack of an ideal method for assessing physical activity for epidemiological studies [31].

Novosibirsk is the third largest city in the Russian Federation, with a highly developed transport network. The number of private cars and the availability of citywide transport infrastructure indicate more than enough prerequisites for reducing the walking load. Thus, the study of the problem of low physical activity of the population and the search for new solutions to prevent physical inertia does not cease to be relevant due to the growing urban and industrial trends. Many foreign and domestic researchers [25], as well as specialists in

medical prevention, are engaged in solving this problem today. The conclusions published by them are related to the study of the influence of the surrounding reality along with such modifying factors as gender differences, age characteristics, health status, upbringing, etc., and are reduced to two important conditions that must be implemented simultaneously: the growth of the population's motivation to increase the level of physical activity; the popularization of dynamic leisure through the creation of a favorable infrastructure for this (accessibility of state, commercial, household, entertainment facilities, public recreation areas – parks, squares, sports grounds).

Many tools are used to assess the activity. The IPAQ became widely known in the late 90s of the last century due to the publications of an international consensus group of competent researchers of physical activity. The creators' goal was to develop a universal tool that would ensure the comparability of measuring the level of physical activity both within individual population groups and at the country and global levels. The questionnaire has been translated into many languages and used in a huge number of studies worldwide over the past two decades. In the Russian Federation, the first data on the use of the IPAQ dates back to 2000 (National Medical Research Center for Therapy and Preventive Medicine [NMIC TPM] of the Ministry of Health of the Russian Federation) [11].

In 2016, researchers at Surgut State University conducted several studies to determine the reliability of the IPAQ questionnaire in various age, gender, and territorial groups. The validity of the questionnaire for residents of Siberia was proven, and computer programs for conducting Internet surveys and processing primary questionnaire data were patented [6, 12; 13; 15; 16].

Researchers from other regions of Russia and the CIS countries have also successfully used the IPAQ in their work to (1) determine the suboptimal health status during the primary screening of cardiovascular diseases, (2) assess the quality of life of patients with type 2 diabetes, and (3) develop population-based wellness programs for residents of different populated areas [17; 18; 19; 20; 21; 22; 23; 24; 26]. This determined the choice of the IPAQ questionnaire as a tool for this study.

Certainly, despite the positive experience of colleagues, every researcher should start conducting any type of research with the pilot stage, which is necessary to (1) make sure that the problem is relevant for the region, (2) outline the circle of people (age, gender, occupation, place of residence, etc.), whose opinion or position is of the greatest interest concerning the problem under study (focus group), (3) test the questionnaire text, test, or survey on residents

of a particular region or representatives of the focus group of the study, (4) determine the most acceptable (convenient for researchers and respondents) form of the survey (face-to-face interview, correspondence-telephone survey, internet survey, etc.), and (5) develop a methodology for processing and calculating data [1].

Materials and Methods

Research objectives are the assessment of the prevalence of sedentary lifestyle among a certain group of adults in the region; the analysis of the level of motivation of a certain group of the adult population of the Novosibirsk region to lead an active lifestyle; the analysis of the possible effect of the modifying factor (obtaining rights and, as a result, reducing the time of walking) on the level of physical activity of a person.

Therefore, students of one of the driving schools in the Novosibirsk region became respondents to the pilot project “Movement” in 2018–2019. The number of people who want to get a driving license every year can be judged based on the data of only one of the many organizations that teach driving a car - for two years, more than two and a half thousand students. Based on the above, the purpose of the study presented in the review is to assess the level of physical activity and the degree of motivation to change it among the adult population of the region in the context of the upcoming change in the mode of life (change of hiking to driving).

The choice of tools was determined by the fact that many questionnaires are commonly used in assessing various types of physical activity (industrial, household, sports, health, leisure, etc.). However, in the last decade, the most common ones are various versions of the IPAQ, which is aimed at assessing the total volume of daily physical activity by finding out the frequency, duration, and intensity of all types of physical activity [5].

The questionnaire used in the study consisted of two parts:

- Questions that give an idea of the degree of motivation of the respondent to change the level of their physical activity;
- IPAQ questionnaire, to which the key is given, allows respondents to assess their level of physical activity independently.

The work with the IPAQ questionnaire at the stage of the pilot study was carried out in two stages:

- In the period from 2013 to 2016, at events dedicated to a healthy lifestyle, the purpose of this survey is to collect feedback about the text of the questionnaire, to interest the population in conducting a self-assess-

ment of their level of activity (the respondents took the questionnaires with them),

- In the period from 2018 to 2019, at the driving schools in the region, the purpose of this survey is to collect data on the level of physical activity of the population (emphasis on the group of people aged 18-45), their willingness to participate in surveys, as well as in the subsequent discussion of the problem.

Surveys on the level of physical activity were conducted on an anonymous, voluntary basis during the seminars-lectures “First Aid and Cardiopulmonary Resuscitation for Victims of Road Accidents.”

The audience was explained that the purpose of the study is to demonstrate the influence of certain factors on the change of the usual lifestyle, which they will evaluate independently on the example of assessing the level of motor activity (pedestrian → motorist).

The randomly selected listeners did not know about the upcoming survey and had not previously met with the IPAQ questionnaire.

The survey participants did not specify their personal data (except for age, gender, height, and weight at the time of the survey), the respondents were instructed on filling out the questionnaire, with an explanation of the terms “intense physical activity” and “moderate physical activity.”

Results

In the surveys of 2018–2019, there were 1,253 participants; 1,096 questionnaires were collected (88% response). The number of listeners who refused to participate in the survey did not exceed 15%; some of the questionnaires were filled out incorrectly (the questionnaire table was filled out incorrectly, some data included in the passport part of the questionnaire was ignored: gender, age, height, and weight).

After collecting the questionnaires and deleting the incorrectly filled forms, 914 sheets were suitable for processing, of which 367 were filled out by men and 547 - by women.

There is a World Health Organization (WHO) periodization of age: young age (18–44), middle age (45–59), and older age (60–74) [2]. The age periodization adopted in Russia differs from the gradation of adulthood [18]. It has therefore been decided to group the age groups in the following way: age groups of 18–39 years olds and 40–65 years olds.

More numerous, naturally, was the first group – representatives of the “18–39” age period.

The survey was mainly attended by young people; the share of extremely overweight (obesity) people did not exceed 1/10 of the respondents.

Independent scoring using the proposed key (according to respondents) made us think about the changes necessary to bring our indicators from the “minimum level” to the “optimal level.” Most of these reviews were received among people under 40 years, who do not experience difficulties related to their health status.

The investigation method in the paper is comparing the relative values and highlighting the proportions of one or another attribute.

The results of the study are presented in Table 1. The average values that characterize the group of respondents emphasize that the main focus of the study was shifted towards a young age due to the specifics of the audience, which did not contradict the main goals of the pilot stage of the study.

In the final calculation of scores, it was found that almost a third of respondents have a permanent lack of movement (according to the results of the IPAQ test, 22% of men and 34% of women have the “hypodynamia” status), which was a discovery for some respondents.

When assessing the motivation to change the lifestyle, it should be noted that before the points were calculated, only a fifth of respondents indicated that they have a long-standing habit of playing sports, visiting fitness halls and swimming pools (men are 9% more likely than women), but there are also those who in the last six months are trying to join more active leisure (on average, 8%).

The same number of respondents periodically, but not regularly, engage in sports or fitness, and another fifth of them plan or are currently trying to “fit into their schedule” constant physical activity (intense or moderate). Thus, about 60% of respondents are motivated, in their opinion, for active leisure, but only 39% have an optimal level of physical activity.

Table 1.

Questions	All	Men	Women
number of respondents (people)	914	367	547
Age, years (average value)	28	24	29
Height, m (average value)	1.71	1.78	1.47
Weight, kg (average value)	68	76	62
BMI (average value)	23.1	23.7	22.7
% of obese respondents (BMI \geq 30 kg / m ²)	7%	6%	8%

End of the Table 1.

1	Please note the level of physical activity that you have	I do not engage in intense or moderate physical activity regularly and do not intend to start in the next 6 months	7%	6%	7%
		I do not do intense or moderate physical activity regularly, but I am thinking about starting in the next 6 months	10%	7%	13%
		I try to start doing intense or moderate physical activity, but I do not do it regularly	22%	18%	25%
		I do intense physical activity less than 3 times a week (or) moderate physical activity less than 5 times a week	21%	22%	21%
		I have been doing moderate physical activity for 30 minutes a day 5 days a week for the past 1–5 months	5%	5%	5%
		I have been doing moderate physical activity for 30 minutes a day 5 days a week for the past 6 (or more) months	7%	6%	8%
		I do intense physical activity 3 or more times a week for 1–5 months	8%	10%	6%
		I do intense physical activity 3 or more times a week for 6 (or more) months	19%	25%	16%
2	How many times a week do you do intense physical activity (days-average)?	3	3	2	
3	How long does your intense physical activity usually last?	Up to 10 minutes	18%	13%	21%
		10–20 minutes	12%	9%	13%
		20–40 minutes	20%	18%	21%
		40–60 minutes	21%	19%	22%
		1 hour or more	30%	41%	23%
4	How many times a week do you do non-intensive (moderate) physical activity? (days - average value)	3	3	3	
5	What is the usual duration of your moderate physical activity during the day?	Up to 20 minutes	21%	22%	21%
		20–40 minutes	24%	21%	26%
		40–60 minutes	22%	19%	24%
		60–90 minutes	14%	17%	12%
		1.5 hours or more	19%	22%	17%
6	How many days a week do you walk? (days - average value)	6	6	6	
7	What is the usual length of your hiking trips during the day?	Up to 20 minutes	9%	6%	12%
		20–40 minutes	27%	18%	33%
		40–60 minutes	22%	24%	21%
		60–90 minutes	16%	19%	14%
		1.5 hours and more	26%	34%	20%

End of the Table 1.

8	How many hours do you spend in a sitting position?	8 hours or more	15%	14%	15%
		7–8 hours	16%	11%	19%
		6–7 hours	15%	15%	14%
		5–6 hours	13%	15%	11%
		4–5 hours	13%	14%	12%
		3–4 hours	18%	19%	16%
		1–2 hours	9%	8%	9%
		less than 1 hour	4%	3%	5%
9	Total points (average value)		25	27	23
10	Current level of physical activity	Hypodynamia	29%	22%	34%
		Sufficient physical activity	33%	27%	36%
		Optimal physical activity	39%	52%	30%
11	Exclusion of walking (influence of the presence of a car) - average value		15	16	15
12	Estimated physical activity after buying a car	Hypodynamia	70%	66%	79%
		Sufficient physical activity	20%	26%	16%
		Optimal physical activity	6%	8%	5%

According to the data obtained during the study, the following was noted:

- Men are less likely than women to use public transport services, preferring to walk (the average duration of walking is about half an hour for women, from one and a half hours for men);
- Average number of days on which respondents habitually take walks is six, and men spend more time on this than women;
- Also, men are more likely to devote more time to intense or moderate physical activity and training (women devote up to an hour of their time to physical activity, and men – more than an hour on average three times a week);

In addition, 46% of respondents are familiar with the daily work associated with a “sitting position.” Working at a computer, they spend “sitting” from 6 to 8 hours a day, 44% spend 3–6 hours daily in a sitting position, the remaining 10% lead a fairly active lifestyle.

After completing the main part of the survey, the respondents were asked to deduct the time they still spend on walking, but when obtaining a driving li-

cense, this situation will not change in favor of physical activity (questions and answers were suggested by the respondents themselves during their thoughts about changing the lifestyle associated with obtaining a driving license): “What is the usual length of your walks during the day?”, “How many days a week do you walk?” reducing them only to weekends.

This technique is crude and is not for every motorist, but it allows one to demonstrate the importance of the most accessible preventive measures, that is, simply walking. The testing revealed significant gender differences. And these differences start directly in the motivational field – women (especially those aged 40 and older) are the least interested in an active lifestyle (Table 2).

Table 2.

The level of motivation in different age groups

Questions	18–39		40–65	
	Men	Women	Men	Women
I do not engage in intense or moderate physical activity regularly and do not intend to start in the next 6 months	6%	11%	5%	16%
I do not do intense or moderate physical activity regularly, but I am thinking about starting in the next 6 months	7%	6%	12%	13%
I try to start doing intense or moderate physical activity, but I do not do it regularly	19%	11%	21%	30%
I do intense physical activity less than 3 times a week (or) moderate physical activity less than 5 times a week	23%	22%	23%	11%
I have been doing moderate physical activity for 30 minutes a day 5 days a week for the past 1-5 months	5%	11%	6%	7%
I have been doing moderate physical activity for 30 minutes a day 5 days a week for the past 6 (or more) months	7%	17%	10%	10%
I do intense physical activity 3 or more times a week for 1-5 months	10%	11%	6%	9%
I do intense physical activity 3 or more times a week for 6 (or more) months	25%	28%	15%	16%

The respondents of both sexes from the younger age group have the highest level of motivation since, among them, only 6% of men and 11% of women do not regularly engage in any physical activity and do not intend to do it, in the age group of 40–65 years of people who do not want to lead an active lifestyle among women even more – 16%.

Thus, according to the IPAQ results, a sufficient level of physical activity was registered in a third of the respondents. In addition, based on the data obtained when analyzing the self-assessment of the usual load, it was noted that men often underestimate their activity, and women, on the contrary, overestimate.

Therefore, one should consider each item of the IPAQ test to exclude bias and subjectivity of respondents' opinions and evaluate data on daily physical activities, their intensity, and duration.

Among the respondents in the age group "18–39 years," 59% of men are daily engaged in intensive physical activity. Among older respondents, such men were not found.

Among women of the same group, 67% are engaged in intensive physical activity for more than an hour every day. Older women and men in this group do not devote time to intense exercise every day.

The majority of the surveyed men in the age group "40–65 years" devote time to intense physical activity, while a third of the respondents indicated that they do more than 1.5 hours a day of training (at least 3 days a week), another third – they do only 10 minutes, which is insufficient for the prevention of cardiovascular diseases.

Women of the same age group, even those who have a short physical activity, are 10% less than men, and those who play sports and spend more than an hour on intensive classes are only 19% (14% less than men in the same age group).

The age group "18–39 years" is naturally characterized by greater physical activity, in the group that pays little attention to intense physical activity, 19% of men and 25% of women.

Discussion

According to the results of our research, it turned out that 46% of respondents experience a constant lack of movement. Our data are consistent with the results of N. I. Medvedkova. et al., who writes that about 50% of respondents in the Perm Krai, the Udmurt Republic, and the Moscow Region devote about 25 minutes a day to physical activity, meaning they also experience a lack of movement. In addition, our study also showed that men prefer more active types of physical activity, such as playing sports, while women prefer walking or running more [10; 22].

However, according to I. F. Islamzade, only about 10% of respondents have high physical activity. and the only physical activity of the rest is walking - to

work and shopping facilities. [5] Our study showed that residents of the region have a higher level of physical activity. About 20% of respondents have a habit of actively exercising, of which 25% of men and 16 % of women devote time to intense physical activity more than 3 times a week.

Unfortunately, few of the respondents decided to replace the “sofa leisure” with a simple walk. And such a simple and accessible way to combat hypodynamia, as taking a walk during a lunch break, was not available to all respondents. Many of them simply have nowhere to walk because the office is far from parks, squares, and quiet streets (but near broadband highways or industrial areas).

This again underlines the severity of the problem of the availability of recreation areas and the low awareness of the availability of such areas. As a result, people begin to look for places for active leisure and sports only when they have difficulties related to their health.

Conclusion

In conclusion, it should be noted that the level of motivation of the adult population of the Novosibirsk region to lead an active lifestyle is at a low level since such a simple and accessible way to combat physical inactivity as taking a walk during a lunch break was not available to all respondents, many simply have nowhere to walk, because the office is located far from parks, squares, and quiet streets. This once again underlines the severity of the problem of accessibility of recreation areas and low awareness of the availability of such. As a result, people begin to look for places for active leisure and sports only when health-related difficulties begin.

As for the assessment of the prevalence of a sedentary lifestyle among a certain group of adults in the region, we may see that the survey of adult students at driving school confirmed the opinion of foreign and domestic researchers that the adult population pays insufficient attention to the simplest preventive measures aimed at improving the level of health, one of which is physical activity. At the time of the study, according to the results of the IPAQ test, 39% of men 40–65 years old and 35% of women 18–39 years old were found to be inactivity; among respondents, about 40% are engaged in some type of physical activity in sufficient quantity, the rest either do not engage in any physical activity at all, or they engage in an insufficient number of times a week or irregularly.

Of particular concern is the fact that regular moderate physical activity (30 minutes, 5 days a week) takes place in the lives of both men and women in a little more than 15% of cases; as for the usual (constantly more than six months)

intense physical activity, it can be noted that it is characteristic of only a quarter of men and 15% of women 18–39 years old.

When analyzing the possible effect of the modifying factor on the level of physical activity of a person, it should be noted that among the project participants who are going to use personal vehicles as a means of transportation in the near future, 22% of men and 38% of women in the group “18–39 years” who currently have a sufficient level of physical activity according to the results of the IPAQ test, in the very near future, they can hardly consider the forecast regarding their level of load favorable.

Since 2020, the study has been included in the Regional Center for Public Health and Medical Prevention action plan as part of the “Assessment of the Habitual Lifestyle of the Adult Population of the Novosibirsk Region” program. Based on this study, a program to increase awareness and motivation of the regional population on physical activity is planned to be developed. There is no conflict of interest in this study.

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