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SUBJECTIVE AND OBJECTIVE CHARACTERISTICS OF PHYSICAL ACTIVITY IN OLDER ADULTS

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Sergey Cherkasov^{1,2✉} , Marina Shapovalova³ ,
Yuriy Boyko⁴, Anna Fedyaeva¹ ,
Alexander Shiroky¹ , Oleg Polozkov¹ ,
Fedor Orlov³

¹ V.A. Trapeznikov Institute of Control Sciences, Russian Academy of Sciences, Moscow;

² National Research Institute of Public Health, Moscow;

³ Astrakhan State Medical University, Astrakhan;

⁴ Russian Medical Academy of Continuing Professional Education, Moscow, Russia

✉ cherkasovsn@mail.ru

ABSTRACT — Physical activity is often considered as an essential component of a healthy lifestyle and is required to be studied in detail. It is especially important to study this issue in reference to the population of older age groups. The aim of the research was to analyse subjective and objective characteristics of physical activity in population of older age groups.

Methods of sociological survey, parametric and nonparametric statistics were used in the work. Data on the characteristics of physical activity were obtained on the basis of a study of 1,045 subjects of both genders aged 60 years and older. The participants of the survey did not have any kinds of disability and were not engaged in any sport activities.

According to the results of the study, the age of the men and women was the determinant of assessing a level of physical activity. The average level of physical activity prevailed in men aged 60–74 years. Low levels of physical activity prevailed in men aged 75 years and older. Women had mostly low levels of physical activity.

Comparison of subjective and objective characteristics of physical activity showed a significant overestimation of subjective characteristics of high levels of physical activity and underestimation of the prevalence of low levels of physical activity in both men and women. As a result of gender comparisons, it was revealed that men aged 60–74 years overestimated their level of physical activity by a fourfold, while women were more objective assessing their level of physical activity.

KEYWORDS — public health, population of older age groups, physical activity.

INTRODUCTION

Human health is formed under the influence of a large number of factors and determinants [1, 2, 3, 4]. Human movement is not limited to his kinetic functions, but it is a fundamental part of everyday life and is the focus of public health guidelines on physical activity. Steps can be accumulated throughout the day while doing housework, fulfilling professional requirements, taking care of children, performing assignments and transportation. Walking and exercise are the most common free time activities. Exercise and sports can also be considered as ways to increase the number of steps per day, but they are not easy to track with pedometers. And taking into consideration the fact that a certain part of the population is not engaged in any sport activities, pedometers may be considered as the most effective tools for assessing physical activity. Using pedometers in behavioural modification programs allows evaluating physical activity that is directly related to moderate weight loss and blood pressure regulation. Studies have shown that 3,000 steps in 30 minutes is roughly equivalent to walking at an average intensity in adults. These steps should have a moderate intensity and be more than 100 steps per minute. A value of less than 5,000 steps per day is regarded as the *sedentary lifestyle index* of groups [5]. The study of subjective and objective characteristics of physical activity and their comparison is an urgent and, however, insufficiently studied problem, especially in relation to the population of older age groups [6]. On the one hand, objective data is needed to develop programs aimed at increasing physical activity level. Nevertheless subjective opinions on the level of physical activity are also very important. They are indicative, even if they do not coincide with objective characteristics. If the level of physical is perceived as high, a person will not make any effort to increase physical activity. In such situations, recommendations for more physical activity will not be implemented. So when identifying risk factors, it is necessary to determine not only objective, but also subjective characteristics of the level of physical activity. If there is a discrepancy in its estimation, the work on its correction should be carried out.

Objective:

the analysis of subjective and objective characteristics of physical activity in the population of older age groups.

MATERIALS AND METHODS OF RESEARCH

Data on the characteristics of physical activity were obtained on the basis of a survey of 1,045 respondents of both genders aged 60 years and older. The respondents lived in Moscow, did not have any kind of disability and were not engaged in any sport activities.

As subjective characteristics of physical activity, we considered the opinion of a respondent, who was supposed to choose from three possible answers: high, medium, and low. As an objective indicator of physical activity, we used the data on the hiking distance per day. During the analysis, three ranges intensity of physical activity were identified. The first range of physical activity implied its high level — walking more than 3 km a day, that is, about 7–10 thousand steps. The second range included 3 km (5 thousand steps), which was characterized as a middle level of physical activity. The third range included a distance of less than 3 km per day (less than 5 thousand steps), and the corresponding load level was considered *low*. When estimating the distance, all physical activity was taken into account (moving around the house, shopping, dog walking, etc.). Since other types of physical activity were rare among the respondents of the studied age groups, the data on hiking distance (number of steps) was chosen as the most objective criterion used to divide groups into subgroups with high, medium and low physical activity. The research analysis was carried out in two age groups: 60–74 years and 75 years and older.

RESEARCH RESULTS AND DISCUSSION

According to subjective perceptions, 16.9 ± 3.8 per 100 men surveyed believe that their physical activity is high, and half of them estimated it as average (49.2 ± 3.9 per 100 men surveyed). Age has a very strong influence on subjective perceptions of the level of physical activity. Thus, in the age group of 60–74 years, men were significantly more likely to consider their level of physical activity to be high (26.6 ± 4.4 in the age group of 60–74 years versus 7.6 ± 2.1 in the age group of 75 years and older per 100 men surveyed) ($p < 0.05$) (fig. 1).

The average level of physical activity was observed by more than half of the surveyed men aged 60–74 years (56.5 ± 3.5 per 100 surveyed men). In the older age group, there were two times fewer of them (25.2 ± 4.1 per 100 male respondents) ($p < 0.05$). Accordingly the number of men with low levels of physical activity was higher in the older age group (46.5 ± 3.1 at the age of 75 years and older versus 14.3 ± 2.5 at the age of 60–74 years). According to subjective perceptions, the level

of physical activity in women is less than in men. Only 10.2 ± 1.9 per 100 women surveyed believe that their level of physical activity is high. The majority assesses their level of physical activity as low (63.3 ± 2.9 per 100 women surveyed).

The age of women, as well as men, has a very strong influence on subjective perceptions on their level of physical activity. If in the age group of 60–74 years, female respondents were significantly more likely to consider their level of physical activity high (19.3 ± 3.6 in the age group of 60–74 years versus 4.6 ± 0.8 in the age group of 75 years and older per 100 women surveyed) ($p < 0.05$). The average level of physical activity was observed in more than half of the women surveyed aged 60–74 years (51.3 ± 3.4 per 100 women surveyed). In the older age group, there were significantly fewer of them (29.5 ± 3.8 per 100 women surveyed) ($p < 0.05$). Accordingly, the number of women with low levels of physical activity was higher in the older age group (63.3 ± 2.1 at the age of 75 years and older versus 28.9 ± 2.1 at the age of 60–74 years) (Fig. 2).

An objectively high level of physical activity was found in 5.1 ± 1.8 per 100 surveyed men aged 60 years and older. In the first of the selected age groups (60–74 years), there were significantly more men with a high level of physical activity — 7.14 at the age of 60–74 years versus 3.14 at the age of 75 years and older per 100 men surveyed. The data obtained is significantly lower than subjective perceptions. So, in the age group of 60–74 years, 27% of men claimed to have a high level of physical activity, while objectively they were able to confirm it four times less. In high school In the age group (75 years and older), the differences were smaller, but also significant — 8% of men declared a high level of physical activity, while objective criteria indicated that 2.5 times fewer men of the corresponding age had such a level of activity.

The average level of physical activity was found in almost half of the surveyed men (46.9 ± 3.1 per 100 surveyed men aged 60 years and older). A low level of physical activity according to objective criteria was observed in almost half of the men in the group under study (44.7 ± 3.5 per 100 respondents). According to subjective estimates, 56% of the surveyed men aged 60–74 reported an average level of physical activity, which also corresponds to objective indicators. In the age group of 75 years and older, two-thirds of the men surveyed ($60. \pm 2.89$ per 100 respondents) walk less than 1 kilometer per day. Differences in the level of physical activity of men in the age groups 60–74 years and 75 years and older are significant ($p < 0.05$).

In older women, a high level of physical activity was observed in 4.2 ± 1.0 per 100 women surveyed. This level of activity was registered more often, as in men, in

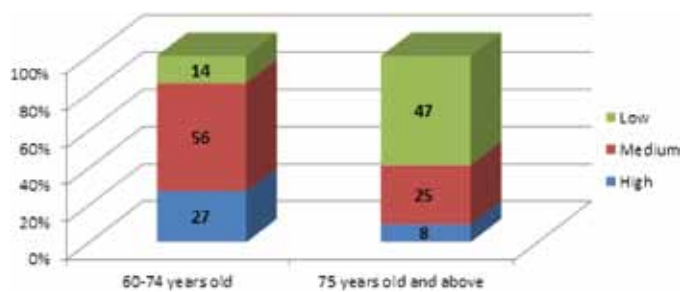


Fig. 1. Data on subjective perceptions of the level of physical activity of men in different age groups (per 100 surveyed men in each age group)

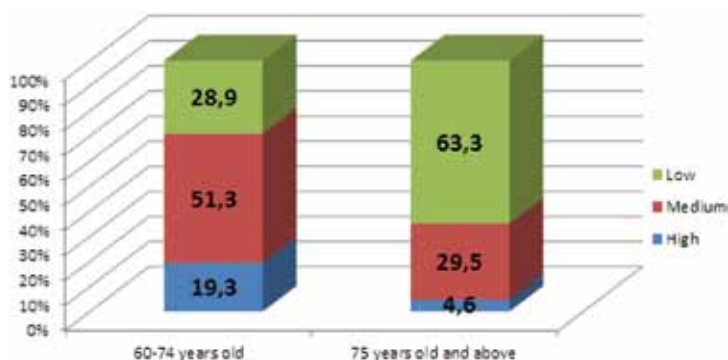


Fig. 2. Data on subjective perceptions of the level of physical activity of women in different age groups (per 100 women surveyed in each age group)

the age group of 60–74 years (7.5 ± 1.7 per 100 respondents). In the age group of 75 years and older, this level of physical activity was observed only in 2.1 ± 0.8 per 100 women.

The average level of physical activity was found in one third of the women surveyed (33.6 ± 4.1 per 100 women aged 60 years and older). In the age group of 60–74 years, 53.1 ± 5.5 per 100 respondents have an average level of physical activity. According to subjective estimates, 51% of the surveyed women in this age group reported an average level of physical activity, which is exactly the same as objective indicators. In the age group of 75 years and older, only one in five women (21.7 ± 4.5 per 100 respondents) walk more than 1 km per day. According to subjective estimates, 29% of the surveyed women are in this category. The respondents of this age group reported an average level of physical activity, which slightly exceeded the objective parameters. Differences in the walking distance among women in the age groups of 60–74 years and 75 years and older were significant ($p < 0.05$).

Women, as well as men, seemed to sufficiently overestimate their level of physical activity. In the age

group of 60–74 years, it was overestimated by 2.5 folds and in the age group of 75 years and older by 2 folds.

CONCLUSION

When comparing subjective and objective characteristics of physical activity, there is a significant overestimation in relation to a high level of physical activity (subjective perceptions) and an underestimation of the prevalence of low levels of physical activity, both in men and women.

Gender comparison showed that mostly men in the age group of 60–74 years overestimated their level of physical activity. In our study, the discrepancy score was up to 4-fold. Women were more critical of their level of physical activity.

Men in the age group of 60–74 years in the majority have an average level of physical activity (covered more than 1 km on foot per day), while men in the age group of 75 years and older have a low level (covered less than 1 km on foot per day). Women in the age group of 60–74 years in the majority have an average level of physical activity (covered more than 1 km on foot per day), while women in the age group of 75 years and older have a low level (covered less than 1 km on foot per day). The results obtained have almost no gender differences.

REFERENCES

1. GENOVESE, U. A new paradigm on health care accountability to improve the quality of the system: four parameters to achieve individual and collective accountability / U. Genovese, S. Del Sordo S., M. Casali et al. // *Journal of Global Health*. 2017. V. 7. Iss. 1. P. 010301. DOI: 10.7189/jogh.07.010301
2. MESHKOV D.O., BEZMELNITSYNA L.YU., CHERKASOV S.N. A Data Management Model for Proactive Risk Management in Healthcare // *Advances in Systems Science and Applications*. 2020. V. 20, Iss.1. P. 114-118. DOI: 10.25728/assa.2020.20.1.864
3. CHERKASOV, S.N. Physical activity as a factor determining the level of the organism's adaptive capabilities / S.N. Cherkasov, O.V. Abramova, I.L. Sopov // *Bulletin of the National Research Institute of Public Health named after N.A. Semashko*. – 2015. – No. 2. – P. 224–227.
4. MEDVEDKOVA, N.I. Physical activity and health of the population / N.I. Medvedkova, V.D. Medvedkov, T.V. Zotova, O. I. Ashirova // *Scientific Notes of the University*. P.F. Lesgaft. – 2019. – No. 3 (169). – P. 201–205.
5. CATRINE TUDOR-LOCKE, CORA L CRAIG, WENDY J BROWN, STACY A CLEMES, KATRIEN DE COCKER, BILLIE GILES-CORTI, YOSHIRO HATANO, SHIGERU INOUE, SANDRA M MATSUDO, NANETTE MUTRIE, JEAN-MICHEL OPPERT, DAVID A ROWE, MICHAEL D SCHMIDT, GRANT M SCHOFIELD, JOHN C SPENCE, PEDRO J TEIXEIRA, MARK A TULLY, AND

STEVEN N BLAIR How many steps/day are enough?
for adults// International Journal of Behavioral Nutrition
and Physical Activity – 2011, V 8, P. 1–18. DOI:
10.1186/1479-5868-8-79

6. YANCHENKO, S.V. How does physical activity affect
the health and life expectancy of a modern person /
S.V. Yanchenko, V.V. Volsky // Young Scientist. – 2019.
– No. 15 (253). – P. 80–83.