The influence of the urban ecosystem on the quality of life of people over 50

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Abstract. The article presents the results of the influence of the urban ecosystem on the subjective assessment of the quality of life of people older than 50 years old. The subjective assessment of some components of the quality of life in people of the older age group was higher compared to the group of young people. Overstated assessments of the quality of life associated with an active lifestyle, a desire to eat right, and a desire for peace of mind indicate a decrease in the level of criticality in people over 50 years old and, as a rule, do not reflect the true state of their physical health. Established in 51.4% of cases, premature aging of the body of people older than 50 years is an unfavorable sign. The revealed change in morphological status in people over 50, which correlates with the desire to master the principles of proper nutrition, as well as a decrease in their functionality against the background of the effects of negative environmental factors, socio-economic stress in society, emotional stress require the search for evidence-based technologies for health conservation.

1. Introduction
Modern processes of urban growth and development determine the development of an urban-type ecosystem. Urban ecosystems are characterized by a high anthropogenic impact on nature and man [1]. Socio-economic, biomedical, environmental transformations of the urban environment affect the quality of human life and health.

As part of the national project “Housing and the National Environment” in Russia in 2018 - 2019, an assessment was made of the quality of the urban environment. According to the Ministry of Construction and Housing and Communal Services of the Russian Federation, the city of Volgograd, assigned to the group of the largest cities (the number of inhabitants is 1 013.5 thousand people), takes 14th place out of 15. The Volgograd urban environment quality index is 116 points. The smallest number of points was scored by categories reflecting the green areas of the city - 9 points, public and business infrastructure of the city - 15 points, social and leisure infrastructure of the city - 17 points [2]. The relatively comfortable urban environment is aggravated by the climate of the Volgograd region - arid, with sharply pronounced continentality. The average January temperature is from -8 to -12, July is from +23 to +25. The absolute minimum temperature is -36 ... -42 ºС and is usually observed in January - February; the absolute maximum of heat + 42 ... + 44 ºС is observed in July - August [3].
The demographic composition of the population of the Volgograd region varies from year to year (figure 1). A decrease in people aged 50-59 by 18 thousand by 2018 was established [4]. At the same time, the number of people 60-69 years old and over 70 years old increased, which was reflected in an increase in the percentage of the working population over working age by 16.5 thousand people by 2018.

![Figure 1. Demographic composition of the population of the Volgograd region (%).](image)

An analysis of the dynamics of the natural growth (loss) coefficients of the population of the city of Volgograd allowed us to establish a decrease in the population from 2016 to 2018 (loss coefficient: 2016 -1.7; 2017 -2.5; 2018 -2.8) [5]. In the structure of mortality of the population, the largest share is constituted by diseases of the circulatory system - 56.0%. At the same time, the mortality rate in old age was ten times lower and amounted to 4.3%.

Quality of life is a comprehensive definition that reflects the social, economic, moral, emotional, physical, mental well-being of a person. The last two are directly related to human health. In world and domestic practice, much attention is paid to health-related quality of life (HRQL). In this aspect, the integral assessment of a person’s quality of life is based on his subjective perception [6], [7], [8]. In connection with the foregoing, the study of the influence of factors of the urban ecosystem on the quality of life of people over 50 is becoming relevant.

2. Materials and methods
A total of 165 respondents living in the city of Volgograd took part in the study on a voluntary basis (table 1). The observation group included 113 respondents (52 people), the control group consisted of respondents aged 18-35 years old.

| Age / Gender | 18-35 years | 50-55 years | 56-60 years | Older than 61 years | Σ |
|--------------|-------------|-------------|-------------|---------------------|---|
| Women        | 34          | 29          | 27          | 16                  | 106|
| Men          | 18          | 15          | 15          | 11                  | 59 |
| Σ            | 52          | 44          | 42          | 27                  | 165|

A subjective assessment of the quality of life was studied using a questionnaire, which included a list of the basic values of human life: material wealth, housing conditions, the environment in the area of residence, family, food, sexual relations, entertainment and leisure, social status, work, spiritual
needs, social support, relatives’ health, personal health, peace of mind, bad habits, hereditary diseases, geographical features (place of residence).

The biological age and the rate of aging were calculated by demographic indicators and anthropometry parameters: age, weight, height, gender, waist circumference, hip circumference [9]. A coefficient value from 0.95 to 1.05 indicated the age-related rate of aging of the body; a coefficient of less than 0.95 is about slowing down aging; a coefficient of more than 1.05 is about premature aging of the body.

Mathematical processing and analysis of primary data were carried out using a software package «SPSS-17».

3. Results and discussion
The human organism is influenced by environmental environmental factors [10-12], food ecology [13], lifestyle [14], the presence of chronic diseases [15-16] creating the prerequisites for involutional processes. There is no doubt that human health is associated with quality of life. The results of subjective perception by respondents of the quality of life, their health, and the ecology of the environment are interesting. The subjective assessment of ecology and life in the area of residence was estimated by the respondents as a percentage, where 0% is completely dissatisfied; 100% - completely satisfied (table 2).

Table 2. Respondents' assessment of the importance of ecology, life in the area of residence.

| Questions                                                                 | 18-35 years | Older than 50 years | p   |
|---------------------------------------------------------------------------|-------------|---------------------|-----|
| Are you satisfied with the climatic conditions in the place of residence (wind, humidity, temperature)? | 57.2 ± 4.6  | 40.8 ± 6.0          | 0.037 |
| Are you satisfied with the environmental conditions in the place of residence (noise, dust, gas contamination)? | 50.0 ± 5.03 | 34.1 ± 5.2          | 0.045 |
| Are you satisfied with the living conditions in the place of residence (shops, services, post office, pharmacy)? | 64.1 ± 4.9  | 56.4 ± 6.2          | -    |
| Do you have conditions for recreation and sports in the place of residence (parks, promenade, recreation areas)? | 57.2 ± 5.01 | 42.3 ± 7.5          | -    |
| Do you have difficulty with public transportation?                        | 65.5 ± 4.8  | 55.6 ± 8.0          | -    |

According to the data obtained, the subjective assessment of ecology and life in the area of residence in the group of people over 50 years of age is significantly different compared to the group of young people 18-35 years old. Most of all, they are “dissatisfied” with the weather conditions of the sharply continental climate of the Volgograd region (dissatisfied - satisfied with 40.8 ± 6.0%; p = 0.037) and environmental conditions (dissatisfied - satisfied with 34.1 ± 5.2%; p = 0.045). Moreover, the percentage of satisfaction in the category of “environmental conditions” both in the group of young people (50.0 ± 5.03%) and in the group of people over 50 years old (34.1 ± 5.2%) turned out to be the smallest compared to others categories, which is consistent with the urban environment quality index (116 points) obtained by the city of Volgograd.

Table 3. The complex influence of the rate of aging and age.

| Comparison groups          | Coefficient speed of aging | More than 1.05 | 0.95-1.05 | Less than 0.95 |
|----------------------------|----------------------------|----------------|-----------|---------------|
| Older than 50 years old    | 18.9%                      | 29.7%          | 51.4%     |               |
| 18-35 years old            | 46.4%                      | 33.5%          | 20.1%     |               |
For human aging, heterochronism is characteristic, which performs a compensatory function, contributing to the preservation of some functions at the expense of others. The unevenness of the pace and the severity of age-related changes in various body systems can have both a positive focus (slowing down the aging process) and a negative focus (accelerated or premature aging). According to our research, in the group of 50 years and older, the respondents were predominant with the processes of premature aging - 51.4%, while in the group of 18-35 years old they turned out to be 2 times less (20.1%) (table 3). It should be noted that accelerated aging processes prevailed in people aged 50-55.

There is no doubt that the pace and speed of aging of a person is associated with his state of health, lifestyle. In general, 29% of respondents from the group of 18-35 years old and 10% of respondents over 50 years of age assessed their health as “very good”; “Good” - 56% and 39%; “Mediocre health” - 12% and 36%; “Bad” - 3% and 15%, respectively (figure 2).

The results of a subjective assessment of vital activity made it possible to establish that the overall score in the group of people over 50 was significantly higher compared to the group of young people (6.7 ± 0.91; 4.5 ± 0.5; p = 0.038). With age, a person accumulates experience in resolving various life situations, his emotional stability, and the ability to withstand difficult life situations develop throughout life. In our opinion, on the one hand, the optimism that is characteristic in most cases of people 50 years of age and older is due to the fact that people of this age category live in the present tense "here and now." They do not make long-term plans for the future, enjoy taking care of their grandchildren. However, on the other hand, a decrease in the criticality in assessing the quality of one's life in people over 50 can lead to an unreasonably high assessment of the subjective assessment of one’s health. Answers to questions were accompanied by comments: “And what can we do? We live with the diseases that we have and try not to get stuck on this. ” Subjective assessment of the state of physical and mental health in people over 50 does not reflect the true state of their health.

By virtue of age, young people have reserve opportunities for maintaining health, even taking into account the fact that they are less balanced in emotional terms, they want to get “everything at once” from life. Moreover, for the most part, young people, mostly under 25 years old, are not ready for difficult life situations, are not able to cope with negative feelings, situations of frustration.

According to the correlation analysis: the older the person, the more he pays attention to proper nutrition (r = 0.354; p = 0.016), peace of mind (r = 0.294; p = 0.047), his need for communication with
friends decreases ($r = -0.349; p = 0.018$). Moreover, regardless of age, in most cases the respondents assigned the first rank to the “Family” category. Respondents assigned matching ranks to the categories: “Ecology, everyday life in the area of residence” (4th rank), “Culture, spiritual needs” (5th rank), “Material wealth” (6th rank). At different poles there were categories such as “Apartment, living conditions” (rank 3 in most cases was assigned to young people; rank 8 was assigned to people over 50), “Nutrition” (rank 9 in most cases was assigned to young people; rank 2 was assigned to people over 50 years).

4. Conclusion
The quality of life of people depends on many socio-economic, environmental, biomedical factors. However, the state of his physical, mental and moral health remains a priority criterion in a number of criteria for human well-being.

The subjective assessment of some components of the quality of life in people of the older age group was higher compared to the group of young people. Estimates of the quality of life associated with an active lifestyle, the desire to eat right, and the desire for peace of mind, in our opinion, indicate a decrease in the level of criticality in people over 50 years old and, as a rule, do not reflect the true state of their physical health. Natural aging, and even more so premature aging, leads to a decrease in regulatory, adaptive and functional capabilities of the body.

Established in 51.4% of cases, premature aging of the body of people older than 50 years is an unfavorable sign. The severity of age-related changes that go beyond the limits of a person’s functional and adaptive capabilities disrupt the activity of basic life-support systems. At the same time, the cardiovascular system and the respiratory system primarily respond to any changes that occur in human life.

The noted change in the morphological status in people over 50 years old, which correlates with the desire to learn the principles of proper nutrition, decreased functional capabilities, which is caused by the negative impact of environmental factors, socio-economic stress in society, emotional stresses, require the search for evidence-based technologies for health conservation.

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References
[1] Sevriukova G A, Isupov I B, Tovmasian L A, Bocharova I A and Golovanova M A 2019 Environmental Risks and Their Influence on Biological Age of the Population of the Volgograd Region IOP Conference Series: Earth and Environmental Science 224 012003
[2] Indeks kachestva gorodskoj sredy 2019 (Moscow: Ministerstvo stroitel'stva i zhilishchno-kommunal'noho hozyaistva Rossijskoj Federacii)
[3] Doklad «O sostoyanii okruzhayushchej sredy Volgogradskoj oblasti v 2018 godu» 2019 (Volgograd: Komitet prirodnynh resursov, lesnogo hozyaistva i ekologii Volgogradskoj oblasti) Retrieved from https://oblkompriroda.volgograd.ru/upload/iblock/3cc/Doklad-2018.pdf
[4] Volgogradskaya oblast' v cifrah 2018 (Volgograd: Territorial'nyj organ Federal'noj sluzhby po Volgogradskoj oblasti) Retrieved from https://volgstat.gks.ru/official_stat_publications
[5] Ocenka vliyaniya faktorov sredy obitaniya na zdorov'e naseleniya g. Volgograda po pokazatelyam social'no-gigienicheskogo monitoringa v 2018 godu 2019 (Volgograd: Upravlenie Federal'noj sluzhby po nadzoru v sfere zashchity prav potrebitelej i blagopoluchiya cheloveka po Volgogradskoj oblasti)
[6] Pogosova N V, Baichorov I Kh, Yuferova Yu M and Koltunov I E 2010 Quality of Life of Patients with Cardiovascular Diseases: Contemporary State of the Problem Kardiologiia 50(4) 66-78
[7] Ludin S M, Rashid N A 2019 Health-related quality of life after 6 months’ post-injury on severe traumatic brain injury: A cohort study in two Malaysian hospitals Enfermería Clínica 29 674-
80

[8] Bakker M, Uijl I, Hoeve N, Domburg R et al 2020 Association Between Exercise Capacity and Health-Related Quality of Life During and After Cardiac Rehabilitation in Acute Coronary Syndrome Patients: A Substudy of the OPTICARE Randomized Controlled Trial Archives of Physical Medicine and Rehabilitation Retrieved from https://doi.org/10.1016/j.apmr.2019.11.017

[9] Gorelkin A G, Pinhasov B B 2010 Sposob opredeleniya biologicheskogo vozrasta cheloveka i skorosti starieniya (Patent na izobretenie RU 2387374 C2, Zayavka № 2008130456/14) Retrieved from https://e-library.ru/download/elibrary_37728122_68587014.pdf

[10] Bilgen S, Sarkaya I 2015 Exergy for environment, ecology and sustainable development Renewable and Sustainable Energy Reviews 51 1115-31

[11] Proctor D M, Relman D A 2017 The Landscape Ecology and Microbiota of the Human Nose, Mouth, and Throat Cell Host & Microbe 21(4) 421-32

[12] Mayer J D 2000 Geography, ecology and emerging infectious diseases Social Science & Medicine 50(7-8) 937-52

[13] Raubenheimer D, Simpson S J, Couteur D, Solon-Biet S M, Coogan S 2016 Nutritional ecology and the evolution of aging Experimental Gerontology 86 50-61

[14] Cai R, Chao J, Li D, Zhang M, Kong L, Wang Y 2019 Effect of community-based lifestyle interventions on weight loss and cardiometabolic risk factors in obese elderly in China: A randomized controlled trial Experimental Gerontology 128 110749

[15] Buffa S, Borzi D, Chiarelli R, Crapanzano F, Lena A M, Nania M, et al 2019 Biomarkers for vascular ageing in aorta tissues and blood samples Experimental Gerontology 128 110741

[16] Gaston K J, Soga M, Duffy J P, Garrett J K, Cox D T C 2018 Personalised Ecology Trends in Ecology & Evolution 33(12) 916-25