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Residents' perception of living environments and self-rated health status

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Abstract--The relationship between health status and living environment conditions among residents of high-rise housing massifs and individual households was assessed by means of a questionnaire survey-interviewing. Results determined that residents of multi-story buildings had a greater number of individuals classified as frequently ill, but the differences were not significant because of the wide variation in age and gender: $40.9 \pm 12.9\%$ (multi-story buildings) and $21.5 \pm 2.4\%$ (Individual households), $t=1.4$, $P>0.05$. Responding to the question about what citizens attribute the likelihood of their illnesses to, the majority of respondents answered that it is related to unfavorable living conditions ($53.8 \pm 13.0\%$ of residents of multi-story buildings and $54.8 \pm 14.2\%$ of residents of individual houses, $P>0.05$). The greatest number of respondents considered it necessary to improve recreational opportunities, ranging from 46.8% to 60.6% , with such wishes being more common among those over 55 years of age. Individuals of younger age, especially those living in an array of

multi-story buildings, more often express the need for sports fields or complexes.

Keywords---urban environment, inner-city residential environment, infrastructure, living conditions, population morbidity, self-rated health status.

Introduction

Urban environment is a combination of anthropogenic objects, components of the natural environment, natural-anthropogenic and natural objects. In recent decades, environmental problems of the urban environment have become more acute. These include: chemical, physical and biological pollution of atmospheric air, surface and ground water, soil and vegetation cover. A separate problem is the removal and recycling of urban garbage and industrial waste. Poor architectural and planning decisions in the course of creation of artificial urban environment lead to the appearance of video pollution (videoecology)[1, 6, 9].

The development of production of modern materials, the development of advanced technologies and the introduction of global standards have significantly increased the quality and expanded the range of elements of improvement and equipment of courtyards. At the same time, the inconsistency of the current state of the yards to the possibilities of modern landscaping is becoming more and more apparent [2, 3]. It should be noted that recently special attention has been paid to the improvement of the urban environment in our country. There is a fundamental shift from solving purely utilitarian problems to creating a comfortable harmonious environment with aesthetic value.

Engineering and technical level of life support has increased immeasurably, which requires qualitatively new approaches to the restructuring of the urban environment and necessitates research in the system "human - city - the natural environment"[4, 5, 7]. Nowadays, the urban environment must conform to the ideals of humanism through its architectural and urban planning infrastructure. The main value in the idea of humanism is the human being. The ideas of humanism are aimed at establishing humane relations between people, which preaches equality of people regardless of religion, nationality, material security, etc., and also imply creation of conditions in urban environment with high quality of life for physical and spiritual development of each person and his self-realization [3]. Many factors of the urban environment, which affect the health of citizens, have been studied. Such factors include: planning features and prevailing types of development of neighborhoods, social infrastructure, landscaping and green spaces, availability of recreational areas and recreational facilities, microclimate condition, atmospheric air pollution, impact of physical factors (noise, radiation level, electromagnetic fields), effective sanitary cleaning of districts [6, 8, 10].

The aim of the study

was to assess the factors that characterize the living environment based on the

subjective opinion of urban residents of residential neighborhoods of high-rise and individual housing on the state of their own health, well-being in linkage to living environments.

Objects and methods of research

The object of the study were the results of the study of subjective opinion of the population on morbidity, on the state of their own health and well-being in living conditions in apartment neighborhoods of high-rise and individual housing. To study the subjective opinion of the population, we conducted a survey-interview of the population using questionnaires followed by the use of calculation, statistical and analytical methods of research.

The questionnaire for the survey-interviewing consisted of several blocks: the general part, architectural and planning characteristics, the state of engineering infrastructure: electricity, artificial and natural lighting, ventilation, heating, water supply and sanitation; recreational areas; disposal of household waste; health and well-being. A questionnaire poll was conducted among 1406 residents of Tashkent city, including 988 people living in apartment neighborhoods of multi-story buildings and 418 people living in individual housing.

Results of the study and their discussion

One of the questions of the questionnaires was a subjective assessment of the health status of the residents ("were you sick during the last year"). It turned out that there were no significant differences in the frequency of illness among the residents of residential areas: $87.1 \pm 5.2\%$ of residents of multi-story residential buildings had acute diseases at least once a year, and $76.6 \pm 4.0\%$ ($P > 0.05$) among the residents of detached houses.

At first view, residents of high-rise residential buildings have a bigger number of persons referred to the frequently ill, but these differences are not significant because of the wide dispersion of data in the age and gender groups: $40.9 \pm 12.9\%$ (multi-story residential buildings) and $21.5 \pm 2.4\%$ (individual houses), $t = 1.4$, $P > 0.05$. At the same time it was noted that in multi-story buildings older age groups were significantly more often ill (Fig. 1): there were 2.4 times more often ill men over 60 years old in such buildings, and 3.4 times more often ill women than persons under 60 years old. There is little difference in the indices of frequently ill persons in the above age groups in individual houses.

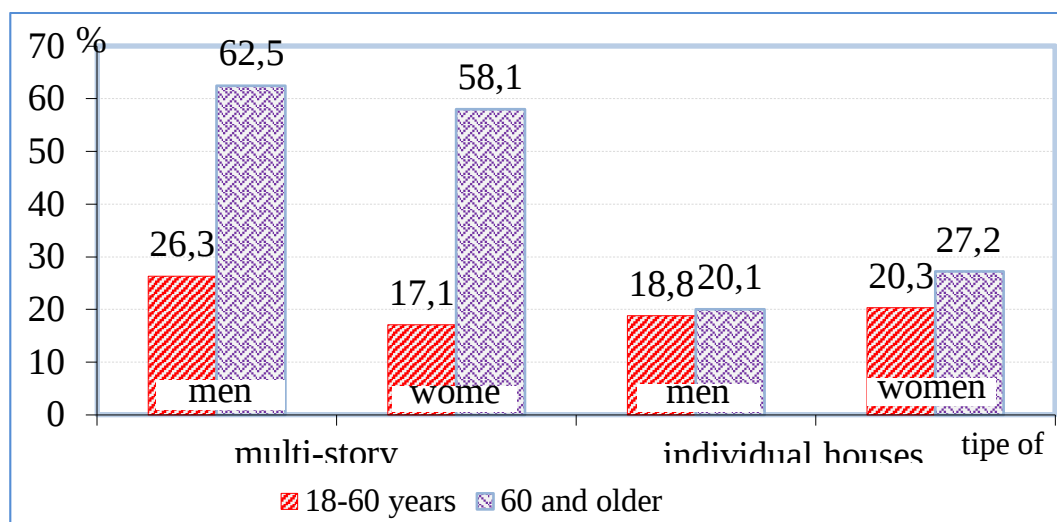


Figure 1. Structure of frequently ill persons in residential areas of different types (% of the number of respondents)

According to the self-rate health status of the residents' the structure of diseases is very close, regardless of the place of residence (Table 1), except for endemic goiter (IV class of diseases) which was indicated only by the residents of individual houses, as well as diseases of the musculoskeletal system and connective tissue, which in these residents occur almost 2 times more frequently than in the residents of multi-story buildings. As for chronic diseases, the frequency of persons with such diseases also has no reliable differences for the general population (61.2 ± 16.4 and 42.3 ± 11.7 , $P > 0.05$), but there are significantly more elderly people with chronic diseases in neighborhoods of multi-story buildings: 93.5% vs. 63.1% in individual households. These indicators are subjective in general, but they allow us to conclude that a significant part of the population evaluates their health negatively.

Table 1
Morbidity structure of the residents of the studied residential areas according to theirself-assessment (% of the total number of ill people)

Diseases	ICD-10	Multi-story buildings		Individual households	
		%	rankin g	%	rankin g
Diseases of the respiratory system	X	59,65	1	61,95	1
Diseases of the circulatory system	IX	27,9	2	21,4	2
Diseases of the digestive system	XI	4,95	3	5,8	4
Diseases of the musculoskeletal system and connective tissue	XIII	3,95	4	7,8	3
Diseases of the eye and adnexa	VII	0,9	5	0,3	6
Diseases of the ear and mastoid process	VIII	0,25	8	0	0
Diseases of the blood and blood-	III	0,5	6	0	0

forming organs and certain disorders involving the immune mechanism					
Diseases of the genitourinary system	XIV	0,35	7	0,3	6
Endocrine, nutritional and metabolic diseases	IV	0	0	2,3	5
Others		1,55	0	0,15	0

When asked what urban residents attribute the likelihood of their illnesses to, the majority of respondents answered that it was related to living conditions ($53.8 \pm 13.0\%$ of high-rise residents and $54.8 \pm 14.2\%$ of residents of detached houses, $P > 0.05$). At the same time, the residents of these massifs differently estimated the importance of such factors as age, working conditions, housing, food, and hygienic factors of the housing massifs. Of the residents of high-rise buildings, 3% associated their diseases with age, 1.45% with working conditions, 4.7% with nutrition, 3.5% with housing conditions, $11.1 \pm 2.6\%$ with housing estate conditions, and the rest with all of the above factors. In houses of individual development 10,0% of inhabitants connect their ill-health with age, 6% - with working conditions, 3,5% - with irrational nutrition, 2,1% - with living conditions and $10,4 \pm 1,8\%$ with factors of intra quarter environment, the rest - also with all the mentioned factors. These figures suggest the high importance of the neighborhood living environment for the well-being and health of citizens.

Among the residents of individual housing, the level of respiratory diseases is significantly higher. It could be assumed that this is caused by worse microclimate conditions in the houses of individual construction. However, this assumption was not confirmed in the survey of residents (Table 2), since it turned out that in individual houses 1.6 times more often favorable thermal well-being of citizens than in multi-storey buildings ($P < 0,05$). In the hot season of the year thermal discomfort (overheating) is 3,2 times more often experienced by residents of multi-storey houses ($P < 0,05$). At the same time, damp apartments occur with almost equal frequency ($P > 0.05$) in both types of residential areas. Therefore, unfavorable microclimate of apartments is less important as a risk factor for respiratory diseases for residents of individual houses than for residents of high-rise residential buildings. It is possible that more significant risk factors are factors of the nonresidential environment, including such factors designated as "hindering" by the majority of interviewees. The frequency of individuals who are disturbed by negative factors of the intra-residential environment depends both on the nature of the residential area and on the age and gender of those interviewed.

Table 2

Urban residents' assessment of the microclimate conditions in their homes,
% of the total number of respondents

Characteristics neighborhood environment	Multi-story buildings	Individual households	P
During winter in the apartment:			
It is warm	$49,0 \pm 6,8$	$77,2 \pm 8,2$	$< 0,05$
It is cold	$50,9 \pm 7,8$	$22,8 \pm 9,5$	$< 0,05$

During the summer in the apartment:			
It is hot	52,4±16,3	16,1±5,4	<0,05
it is warm	47,6±16,3	83,8±5,4	<0,05
The feeling of dampness in the apartment:			
Yes	35,6±11,1	27,1±6,2	>0,05
No	64,3±11,1	72,8±6,2	>0,05

In a multi-story residential area, 83.5±5.4% of respondents said that the living environment is worsened by some factors of the intra-block environment, including noise, neighbors, unpleasant odors, and polluted air. The same "disturbing" factors are noted by 54.8±3.6% of residents of individual houses ($P<0.05$), and it turned out that in the residential area of individual development significantly more people are disturbed by such factors as noise (high-rise buildings - 11.4±0.5, individual houses - 17.8±2.9, $P<0.05$), polluted air (respectively, 3.0±0.9% and 7.9±2.0%, $P<0.05$) and unpleasant odors (respectively, 2.0±0.7% and 6.5±1.8%, $P<0.05$), but the combined effect of these factors in individual houses was 3.5 times less common among residents than in multi-story buildings (respectively, 18.0±5.0 and 63.8±5.8, $P<0.01$). Among persons over 60 years of age both types of massifs complain 1,3-2 times more than in younger age, among women - 1,5-2 times more than among men.

Among the reasons for the deterioration of the living environment of residential areas ("disturbing" objects), respondents include a variety of objects, and their presence in residential areas of different types is indicated by a different number of respondents (Table 3).

Table 3
Objects, according to respondents, worsening the living environment
residential areas, % of the number of respondents

"Disturbing" objects	Multi-story buildings	Individual households	P
Industrial facilities	38,8±8,5	9,7±2,5	<0,01
Transport highways	24,7±9,4	17,0±6,5	>0,05
Waste bins platforms	8,9±2,7	17,0±1,5	<0,05
Cafes, restaurants	14,4±2,7	17,0±5,0	>0,05
Petrol stations, parking lots, car washes	8,15±1,7	12,1±2,1	>0,05
Kindergartens, schools	0,6±0,5	15,0±5,0	<0,05
Stores, markets	1,5±0,4	5,0±2,5	<0,05
Residential buildings, hostels	2,1±0,2	2,4±1,2	<0,05
Others	0,8	4,8	
Total:	100	100	

Industrial objects as "disturbing" are 4 times more often mentioned in the multi-story buildings, waste bins platforms - 1,9 times more often - by residents of individual households. It is interesting that kindergartens and schools, located in the massif of individual housing, are 25 times more often mentioned as an "disturbing" factor (source of noise) compared to the massif of multi-storey

buildings. In general, the most important "disturbing" objects on the high-rise building massif are industrial facilities, transport highways, cafes, restaurants, petrol stations and parking lots.

In the massif of individual housing are equal degree of importance of such objects as transport highways, garbage sites, cafes (by 17%), followed by kindergartens and schools, then petrol stations and parking lots. Many respondents associated the unfavorable conditions of the residential environment of neighborhoods with insufficient green areas, poor sanitary condition of the territory and children's playgrounds.

The population's assessment of green spaces in residential areas is presented in Table 4. less than half of the residents, regardless of the type of residential area, consider its green space sufficient, and in the residential area of multistory buildings such persons are 1,4 times less than in the houses of individual development ($P < 0,05$). The majority of the respondents (54,5-55,1%) are dissatisfied with the landscaping of the adjacent territory, 88,2-90,2% of the respondents are dissatisfied with the landscaping of the streets. Most of the respondents note the lack of recreational areas: 95.5% of the respondents in the residential areas of multi-story buildings, 98.2% of the respondents in individual buildings.

Table 4
Quality of landscaping of residential areas, % of the number of respondents

Neighborhood sites	Find the landscaping is sufficient, %		P
	Multi-story buildings	Individual households	
Neighborhood area	45,5±5,2	40,9±6,4	>0,05
Streets	9,8±1,3	11,8±2,0	>0,05
Recreational facilities	4,5±1,8	1,8±0,03	>0,05
Residential area in general	32,8±3,4	44,3±4,0	<0,05

Another important problem is the availability and equipment of children's playgrounds, especially in the massif of individual housing, where 68% of respondents believe that there are no such playgrounds at all (45.6% in the blocks of high-rise buildings). Improvement of the available children's playgrounds is unsatisfactory, irrespective of the type of residential area: 31-35% of available playgrounds do not have any covering, 64-70% either are not equipped, or the equipment requires repair (Table 5).

Table 5
Improvement of children's playgrounds, % of the number of respondents

Indicators	Multi-story buildings	Individual households	P
Availability of playgrounds	54,4±9,6	31,9±9,0	>0,05
Including those with covering:			
grass	35,3±5,9	55,8±6,2	<0,05

asphalt	30,1±7,8	12,5±6,8	>0,05
uncovered	34,6±12,3	31,6±16,2	>0,05
Playground equipment:			
there is	25,5±10,5	29,4±4,7	>0,05
it isn't	25,7±6,4	15,9±7,1	>0,05
it needs repairing	48,8±1,9	54,5±16,2	>0,05

On the massif of multi-storey building 97.1% of respondents take the waste to garbage sites, but at the same time 47% of the respondents note that the waste from the sites is not taken out regularly. Only half (56.0%) of the residents in the massif of individual development use garbage sites, noting that garbage removal is carried out regularly (74.8%), the remaining residents throw garbage wherever they can.

During the survey, respondents were asked to express their wishes about improving the infrastructure and conditions of the non-residential environment at the housing estate. The results of the survey on infrastructure were expected, as they largely coincided with the objective assessment (Table 6).

Table 6
Wishes of residents to improve neighborhood environment

Facilities	Consider it necessary to increase the number of facilities, M±m		P
	Multi-story buildings	Individual households	
Recreation areas (parks, squares, recreation areas)	46,8±8,8	60,6±5,8	>0,05
Sports grounds (complexes)	15,4±4,6	7,1±0,4	>0,05
Playgrounds for children	18,3±8,0	2,4±0,1	=0,05
Polyclinics, drugstores	4,0±0,3	10,7±1,9	<0,05
Stores, markets	4,3±1,7	5,4±0,4	>0,05
Household facilities	1,3±0,3	10,7±8,0	>0,05
kindergartens, schools	2,2±0,5	0,5±0,4	<0,05
Public transport, petrol stations	2,4±0,8	1,2±0,1	>0,05
Mosques	0,25±0,2	0,6±0,5	>0,05
Workplaces (offices)	0,5±0,4	0	>0,05
Discotheques, cinemas	4,4±0,4	0,6±0,5	

The majority of respondents consider it necessary to improve recreational facilities - from 46.8 to 60.6%, and such wishes are more typical for persons over 55 years of age. Individuals of younger age, especially those living in an array of high-rise buildings, more often express a desire for sports fields or complexes. It is characteristic that the desire for children's playgrounds is 7.6 times more often expressed by residents of multi-storey buildings, which is generally understandable, because in an array of individual development residents consider children's playgrounds as a "disturbing" factor. Of the other objects draw attention wishes to increase the number of clinics and pharmacies, household

facilities (individual buildings), discos and cinemas, stores and markets (high-rise buildings). Every fourth to fifth respondent considers it necessary to improve the landscaping of the residential area (22,5-23,6%), as well as to clean its territory from waste bins platform (21,4-31,4%).

The given data of socio-hygienic studies largely coincide with the objective hygienic assessment of residential neighborhoods, which allows us to highlight the main points requiring correction in the improvement of the intra-block residential environment. Among the residents of massifs of Individual households significantly higher level of respiratory diseases. In massifs of multistory buildings are: recreation areas (1st place), playgrounds (2nd place), sports fields (3rd place), stores and markets, clinics (4th place), in massifs of individual development: recreation areas (1st place), community facilities (2nd place), sports fields (3rd place), clinics (4th place).

Conclusions

The relationship between health status and living environment conditions among residents of high-rise housing massifs and individual households was assessed by means of a questionnaire survey-interviewing. Results determined that residents of multi-story buildings had a greater number of individuals classified as frequently ill, but the differences were not significant because of the wide variation in age and gender: $40.9 \pm 12.9\%$ (multi-story buildings) and $21.5 \pm 2.4\%$ (Individual households), $t=1.4$, $P>0.05$.

Responding to the question about what citizens attribute the likelihood of their illnesses to, the majority of respondents answered that it is related to unfavorable living conditions ($53.8 \pm 13.0\%$ of residents of multi-story buildings and $54.8 \pm 14.2\%$ of residents of individual houses, $P>0.05$). The greatest number of respondents considered it necessary to improve recreational opportunities, ranging from 46.8% to 60.6%, with such wishes being more common among those over 55 years of age. Individuals of younger age, especially those living in an array of multi-story buildings, more often express the need for sports fields or complexes.

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