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Providing a framework for examining the factors affecting health in housing in low-rise housing estates

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Abstract

Currently, the main problem of urban health, both in developed countries and in societies such as Iran, is the increase in citizens suffering from inactivity, obesity, weight gain and related diseases. Housing as a space where people spend most of their time has always had a special place in the eyes of architects and has been addressed from different perspectives. Among these, the recent discussion about housing is the issue of housing health. Health has always been one of the main concerns in terms of health factors and has been one of the most important research topics. The present study seeks to present and test a model in the field of housing health and has three hypotheses. The research population is the Architecture and urban planning specialists and university professors in Tehran, of which 97 people have been selected as a sample by cluster sampling method. The research is applied in terms of purpose and is based on a descriptive research method and a causal survey method. Descriptive and inferential statistics were used for data analysis and SPSS 24 software was used to test the relationship between variables. Random sampling method was used to select the sample size. The reliability and validity of the questionnaire was confirmed to be 87.50%. The results of the statistical analysis indicated that all the research hypotheses were accepted.

Keywords: Health, Low-rise Housing, Housing Health, Architecture.

1. Introduction

Housing as a space where people spend most of their time has always had a special place in the eyes of architects and has been addressed from different perspectives. Among these, the recent discussion about housing is the issue of housing health. Health has always been one of the main concerns of human beings [1]. Considering health factors, it has been one of the most important research topics. Housing is known. Personal studies and experiences of each individual have shown that housing can affect the health of the individual and family. Housing should create a safe and healthy environment for its residents [2].

In Iran, citizens are no longer satisfied that the municipality provides street cleaning and lighting at night, and due to rising literacy, public culture and constant comparisons with other communities and cities around the world, the expectations of people living in cities today far exceed expectations. The importance of this issue is also the level of importance of community health. Since housing is the most important living space of all sections of society and at different ages, it is important to be healthy as one of the pillars of disease prevention and helping community health [3].

Due to the close relationship between physical activities such as walking and cycling and the artificial environment (land use and transportation system) in the health of citizens, urban planners and designers pay attention to the approach of developing a compact urban tissue process format with appropriate density [4]. The diverse distribution of land uses and the modes of movement that have been active in many cities around the world have attracted in recent decades. Preventing the irrational growth of cities, suburbanization and evacuation of city centers requires the creation of safe and comfortable facilities for the movement of city residents on foot and by bicycle. This does not mean eliminating cars, but trying to increase the share of pedestrians in cities and prioritize their movement by increasing pedestrian facilities, safety and easy access to public transport instead of using private cars [5].

2. Problem statement

With the advancement of medical knowledge and the promotion of health standards, the prevalence of infectious diseases has decreased, but what society is facing today is the occurrence of non-communicable diseases such as hypertension, diabetes and heart attack, which affect many citizens [2]. Currently, the main problem of urban health, both in developed countries and in societies such as Iran, is the increase in citizens suffering from

inactivity, obesity, weight gain and related diseases. Man needs peace, a sense of security in his private life and respect for his territory by others, and organizing his living environment, except by adopting the right methods in identifying the private and public areas of his life and creating a precise hierarchy in All spatial contexts, access, etc. It is not possible to create such a structure, induce a sense of belonging to the environment to the person, make him responsible in social relations and give identity to his residence [4].

Paying attention to the concepts of territory and privacy in urban plans organizes the artificial environment in accordance with basic human needs and provides and uses appropriate criteria and criteria, creates a correct and coherent structure in settlements [5]. Territory habits make life easier in a sense. When everyone has their own "territory", there is no need to constantly discuss what belongs to whom and who has what right, thus making daily life easier by determining the validity of the territory or property [6]. In addition, useful housing complexes must respond to a wider range of "groups with different lifestyles" in different places. Only paying attention to the diversity of effective human factors and researching the tradition of people living can help clarify the needs and develop a housing model [7].

3. Necessity of research

Housing health status has a great impact on human health. Sometimes it is even possible to build a house with low cost and simple building materials, but this house is hygienic and desirable, and conversely, a house can be built with expensive materials and high cost, but it does not have the necessary sanitary conditions [8]. Health housing is a housing that according to the climatic conditions of the region and the economic and social conditions can provide physical, mental and social comfort to its users, does not cause the spread of infectious diseases and in its building the necessary provisions to prevent Incidents and events are annoying [9]. On the other hand, as much as possible, in order to observe housing hygiene, housing and urban development should be done in a place where there is access to safe and abundant water, suitable air and suitable land to create a suitable space in that place [4]. A suitable housing should be acceptable in terms of building location, drinking water status, defecation and waste collection, and the characteristics of the building in terms of light, ventilation, heat, humidity and noise should be such as to ensure the physical and mental health of residents. And prevent the occurrence and transmission of infectious diseases as well as accidents as much as possible [10].

Indoor injuries are one of the threats to the body's skeletal system. In previous years, we have seen children cutting their fingers with a meat grinder every day of the week, which fortunately has decreased due to structural changes in this device [2]. If there is not enough light and sunlight in the house, we will be deficient in vitamin D. Accidents and injuries that occur in the workplace are mostly related to sleep problems and this problem leads to an increase in accidents, depression and dissatisfaction with work [6]. In a communist society where all the houses are the same size, a person with a larger house may feel satisfied, but unfortunately people in our society are not satisfied enough because they subconsciously compare their house with others, and this is the source of other problems [7].

Even an accident, traffic, and accidents at work and at home are all related, and if we modify part of this complex system, we can take more effective steps to think better about it. The way you sleep and the ergonomic conditions of the house emphasize the possibility of any injury, including brain damage [11]. Unfortunately, we lose \$ 50 billion a year through brain drain, while our oil sales make \$ 40 million at best. Sociologically, there is a difference between home and housing, and home is not a physical place, and is considered a psychological and dream concept that may not be realized. The spirit of the house can be full of cooking, we make the house ourselves and we feel attached to it. Privacy, privacy, lack of aristocracy in other homes, no fear of crime and relationships between people in the home are the characteristics of the home [12].

4. Indicators required in the construction of a residential building

1- Selecting the land where the building is located: In order for the residential unit to have the minimum facilities and public facilities, it is necessary [13-15]:

- The location chosen for the residential building should be as close as possible to the urban or rural context.
- The selected land should not be in a low and wet place and try to choose a place that has a low groundwater level. In areas where the groundwater level is high, such as villages in the north of the country, it is necessary to prevent insulation from penetrating into the building. Something to be done.
- Residential buildings, especially in desert areas of the country should not be built as much as possible in the direction of monsoon and permanent winds.

- As far as possible, the residence should not be built in noisy places or near the railway station or near places that make noise, such as blacksmiths, etc.

2- Ventilation: Having sufficient and fresh air in the residential environment is one of the important principles of housing hygiene. Residential air should be free of any contaminants such as smoke, unpleasant toilet odors, dust particles and harmful gases [3]. In rooms that do not have proper ventilation, due to the breathing of people, the oxygen in the room is gradually consumed and replaced by carbon dioxide gas, which is harmful to humans. Open so that the air in the rooms is regularly ventilated and changed [4, 7].

3- Heat and humidity: Heat and humidity are other effective factors in housing hygiene. The house should be built in such a way that it is easy to store heat in it and the people who live in it feel comfortable in terms of heat and cold [9]. To maintain the health of residents and prevent the loss of body heat energy, indoor heating in cold seasons, about 18 degrees Celsius and in warm seasons 21 degrees Celsius and a humidity of 40% is recommended. To provide heat using heat generating devices and devices, the following two principles must be considered [11]:

- Get the maximum amount of oxygen from the environment for combustion.
- Return the minimum amount of adverse gases to the environment.

Heating appliances in rural and urban areas may be wood-burning stoves, oil heaters, gas heaters; the most common heating device in some villages is a chair [2]. To heat the rooms, try as much as possible to use heaters whose gas and smoke are removed from the room by a pipe so that the air inside the rooms is not dirty and polluted, and if they have to use a charcoal chair, the charcoal should be turned on after Fry it completely outside the room and then move it inside the room so that people do not suffocate and get poisoned by charcoal gas, which is very dangerous and deadly [6]. They may use tubeless heaters to heat rooms, they are very unsuitable devices and they produce carbon dioxide and carbon monoxide gases due to incomplete fuel [8].

One of the suitable devices for heating in villages is tubular heaters, which are fueled by oil, gas, wood or coal. When installing these heaters, the heater pipe must be checked for holes and seams [5]. The healthiest sources of home heating are central heating (radiators) and air conditioners. In the boiler and air conditioner, the heat generator is located outside the room and the spa is directed into the rooms by a closed circuit pipe. Therefore, the following two methods are used to heat homes [15]:

- Direct method: In this method, the heat source is located inside the rooms, such as the heater and the chair.
- Indirect method: In the indirect method, the heat generating source is located outside the rooms, such as the boiler and air conditioning, which is very convenient and hygienic.

It should be noted that the design of the house and the choice of heating method should be done according to the weather conditions.

4. The effect of light, brightness and color on housing: Light and brightness are effective factors in housing health [7]. Light and lighting of houses should be provided based on natural light (sunlight) and artificial light so that during the day the maximum natural light is used for lighting the houses and they have sufficient and appropriate natural light. Usually in the design of the building, the width of the windows should be at least 15 to 20% of the floor area of the room. In any case, you should try to make the windows of the rooms so that the sunlight can easily shine into the rooms [9].

4.1. Artificial lighting: The best source of artificial lighting is electricity, the amount of which should be appropriate and sufficient so that the eyes do not get tired and dim and the light is in a way that does not cause glare in the eyes. It is better to use lampshades and bulbs to control the intense brightness of the lamps. It is better to give light to the room from at least three points in the living room and from two points for other rooms so that it does not dazzle the eyes and illuminates the whole room enough [10]. Some rooms may be dark due to lack of whitewash and soot on the walls, and even artificial light is used in these houses during the day. Therefore, the most suitable colors for painting residential rooms are matte white and light cream [16].

4.2. Natural light: Sunlight and natural light in a residential unit has a direct effect on the health of its residents [12]. The antimicrobial properties of sunlight and its value in combating diseases (such as tuberculosis) are of paramount importance in housing hygiene. Sunlight on the surface of the skin causes the body to produce vitamin A. On the other hand, lack of light and brightness in homes affects the eyesight of the occupants of the house and may cause visual impairment, discomfort and eye fatigue [15].

5. Hypotheses and Hypothesized model

1. H1: Location and minimum public facilities and facilities affects the physical and mental health of people.
2. H2: Adequate and fresh air and air conditioning affect the physical and mental health of people.
3. H3: The temperature and humidity of the place of residence affect the physical and mental health of people.
4. H4: The amount of light and brightness of the living space and the type of color in the house affect the physical and mental health of people.

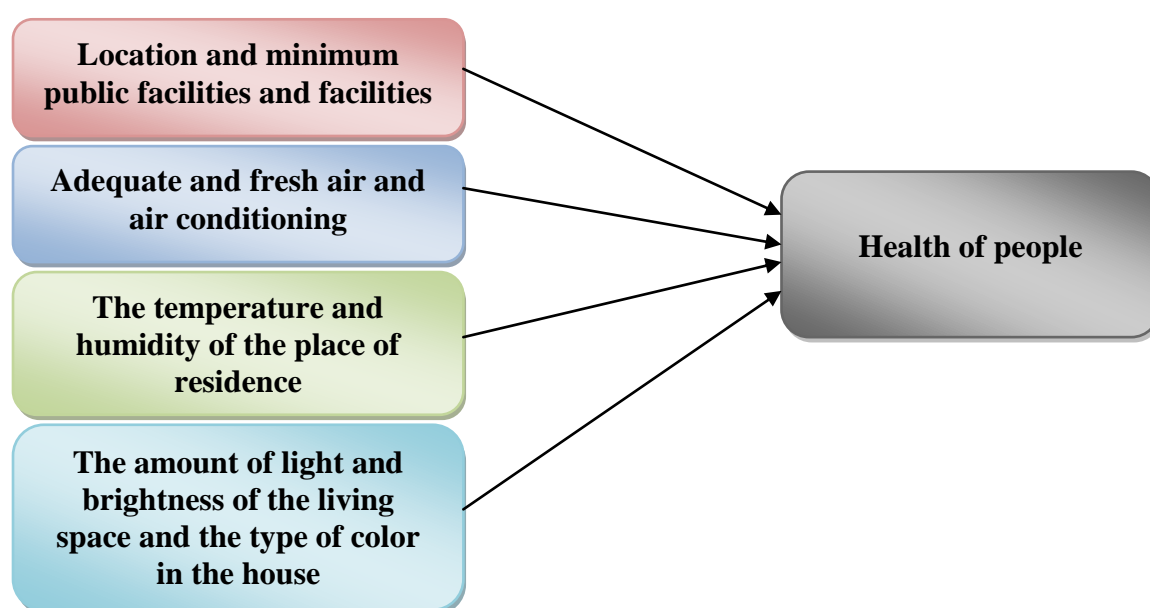


Fig.1.Hypothesized model.

8. The method, target population and sample:

The research population is the Architecture and urban planning specialists and university professors in Tehran. The sample size formulas and procedures used for categorical data are very similar, but some variations do exist. Since the data are qualitatively and the number of statistical community is unlimited, so the sample size calculation formula is as follows:

$$n = \frac{Z_{\alpha/2}^2 p_0(1-p_0)}{\varepsilon^2} \quad (1)$$

In this study, researcher has set the alpha level a priori at .05, plans to use a proportional variable, has set the level of acceptable error at 5%, and has estimated the standard deviation of the scale as .5. Cochran's sample size formula for categorical data and an example of its use is presented here along with explanations as to how these decisions were made.

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.1^2} = 96.04 \quad (2)$$

Where $Z_{\alpha/2}$ = value for selected alpha level of .025 in each tail = 1.96.

(The alpha level of .05 indicates the level of risk the researcher is willing to take that true margin of error may exceed the acceptable margin of error).

Where (p)(q) = estimate of variance = .25.

(Maximum possible proportion (.5) *1-Maximum possible proportion (.5) produces maximum possible sample size).

Where ε = acceptable margin of error for proportion being estimated = .1

(Error researcher is willing to except).

According to the formula at least 97 samples are needed. Therefore, 100 questionnaires were sent between experts and were collected.

9. Analysis of information

The statistical sample in this research includes 100 experts based on questionnaires with complete and usable answers. 28% of these experts have a master's degree, 17% have Ph.D. degrees and 55% have a bachelor's degree. 67% of these experts are male and 33% are female.

We used SPSS 19.0 to analyze the data. In following the results of test hypotheses are offered:

9.1. Testing Hypothesis H1. Location and minimum public facilities and facilities affects the physical and mental health of people.

The results of SPSS are shown below:

Table. 1. One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
H1	100	6.8443	1.01973	.17362

Table. 2. One-Sample Test

	Test Value = 5					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H1	16.844	99	.000	1.4721	1.09443	1.6832

9.2. Testing Hypothesis H2. Adequate and fresh air and air conditioning affect the physical and mental health of people.

The results of SPSS are shown below:

Table. 3. One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
H2	100	6.8426	1.0964	.17031

Table. 4. One-Sample Test

	Test Value = 5					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H2	16.8443	99	.000	1.6843	1.6385	2.0591

9.3. Testing Hypothesis H3. The temperature and humidity of the place of residence affect the physical and mental health of people.

The results of SPSS are shown below:

Table. 5. One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
H3	100	6.7392	1.0793	.19831

Table. 6. One-Sample Test

	Test Value = 5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H3	15.0946	99	.000	1.7931	1.0588	1.7692

9.4. Testing Hypothesis H4. The amount of light and brightness of the living space and the type of color in the house affect the physical and mental health of people.

The results of SPSS are shown below:

Table. 7. One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
H4	100	6.6372	1.09873	.18756

Table. 8. One-Sample Test

	Test Value = 5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H4	15.0809	99	.000	1.8247	1.0834	1.8769

According to the results of this study, meeting the physical and mental needs of people living in the home, preventing the spread of diseases, sanitary disposal of sewage and waste, having proper lighting and ventilation, proper use of personal hygiene items, no excessive noise, accident prevention For children, the elderly, etc., home health is one of the most important issues. Lack of house dust, humidity, dust and lack of personal hygiene will cause various diseases in people, he added. And to ensure the health of family members, the temperature inside the building is better, in cold seasons of the year is about 18 to 20 degrees Celsius and in warm seasons between 21 to 23 degrees and the location of the building and its rooms and doors and windows should be Let the sunlight shine easily into the room, because the lack of light, in addition to the negative impact on the mental health of family members, sometimes creates problems in terms of germs washing clothes and sheets.

To prevent accidents at home, which is one of the most important causes of death and disability in young children and the elderly, cooking work should be done in the kitchen or a separate place, and how to place household items and medicines. And detergent and chemical compounds in such a way as not to cause problems. Residential homes should be equipped with clean and washable toilets and toilets, and personal hygiene items such as toothbrushes should be stored in a way that does not contaminate them.

10. Conclusions

Architecture shapes the quality of the environment and contributes to the health and happiness of the inhabitants of these environments. Architects work with end users of buildings and residential environments to meet their needs and wants. By creating living, working and activity environments, they can promote cooperation, togetherness, communication and interaction between people. They can contribute to the physical and mental health of human beings and be a source of happiness. Architecture works in places where they are facing poverty or have problems such as climate change or natural disasters and are planning to

rebuild. A close relationship between an architect and users is the basic environment for building the best type of building.

Many of us are fully aware of the connection between what we eat and what we feel. The buildings we live and work in, like the food we eat, affect our mental and physical health. One of the above effects is the style of architecture that makes us more active and have a more vibrant way of life. Obesity and diabetes are two types of diseases that are increasing rapidly. And one of the reasons is that we are motionless for long hours and we are sitting in a fixed place. Therefore, the measures that are considered in the architectural design of the exterior of buildings and streets are the design of sidewalks and bicycles (it is worth noting that sidewalks are different from sidewalks) and the development of open spaces of buildings that increase the possibility of residents, especially children. Gives. Building different blocks that share a common green space has a very effective role in encouraging residents to be physically active and have social interactions. In buildings, it is better to use stairs than elevators to walk the distance between nearby floors. To encourage this, some architects design stairs as a distinctive architectural element with sufficient light. There are also factors in the interior architecture of buildings that are psychologically influential. Quiet environment with the least possible noise (architecture that reduces congestion and noise) increases the sense of control over the space and adaptation to it, the use of natural light, removable furniture or appliances in the house (such as a folding bed or Multifunctional tables) reduce the feeling of violence and nervousness.

The residential environment must be able to meet the physiological needs, security, health, social interaction and psychological well-being of human beings. During the Corona, mental health was at the forefront of expectations of housing, and this became doubly important for families with vulnerable groups (children and the elderly). Therefore, in order to fill the gap of communication with the outside space, people were looking for an alternative space, a space that mediates people's social life. In our old architecture, private open spaces such as courtyards, porches, etc. played this role, but in recent decades, due to the economic approach to the housing market, these types of spaces have been removed from the architecture of the house. To fill this gap, people used the roof and terrace spaces as a collective space without being designed for such a function, following a collective movement. In this paper we provided a framework for examining the factors affecting health in housing in low-rise housing estates.

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