Original Article

# Assessing the Knowledge and Attitude of Residents of an Urban Community in Relation to Health Performance of Housing in Kermanshah, Iran

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## Abstract

**Aim:** The aim of this study was to investigate the knowledge and attitude of the staff of a university of medical sciences about housing health in Kermanshah, Iran. **Materials and Methods:** For this cross-sectional descriptive-analytical study, based on Morgan Table 100 people were randomly selected and knowledge and attitudes about housing health were assessed based on a researcher-made questionnaire in 2017. The obtained data were analyzed using SPSS software version 18 and paired *t*-test on Likert scale. **Results:** A total of 100 employees were studied, more than half of them (60%) were female and more in the group of 20–29 years. The mean scores of knowledge and attitude of the target group regarding housing health were 18.35 and 78.00, respectively. The mean score of knowledge in men and women is significantly different ($P < 0.001$). However, the attitude scores of the two groups were not statistically significant ($P = 0.15$). Although knowledge of housing quality was reasonable among respondents, the method of disposing of sanitary waste and housing maintenance was poor. The highest score of women's attitude was related to the groups with diploma and/or associate degree and the highest score of knowledge and attitude in men was related to the groups with bachelor's degree or higher. **Conclusion:** This study showed that people with higher education have better knowledge and attitudes about housing health than people with lower education. However, more research is needed to fully understand the link between housing and adverse health outcomes.

**Keywords:** Attitude, health performance, housing health, Kermanshah, knowledge

## Introduction

Housing health is the result of new awareness of the role of housing in health and with the development of social housing associations, stricter quality requirements and trade regulations.[1] It has shaped the relationship between the environment and the health of modern housing. There is considerable scientific evidence on the relationship between the environment and health in general and housing and health in particular. Among the basic human needs (food, clothing and home), housing is one of the basic human needs and access to adequate housing is one of the basic human rights.[2] A house provides not only a shelter, but also accommodation and daily protection, and a private area or space for relaxation and social interactions between residents.[3]

Housing is very important because it is a place where most people spend most of their time, and therefore the relationship between housing and health is complex.[1,4] Housing hygiene refers to quantitative and qualitative conditions in which the basic physical and vital needs of the residents are met and the occurrence of accidents and the spread of infectious diseases is prevented.[3,5]

The Housing Health and Safety Rating System is a new approach by the British government to assess the potential health and safety risks of any home disability. Europe's basic

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need for healthy housing is: "The building must be designed and constructed in such a way that the health of residents and neighbors is not endangered due to: the release of toxic gases, air pollution with particulate matter and hazardous gases, water or soil pollution, poor removal of sewage, smoke and moisture in the building or interior surfaces."[6] A WHO expert committee has recommended the following standards for housing health:

A healthy home provides shelter and physical protection for human beings and should have a suitable place for cooking, eating, washing and disposing of solid waste, and preventing the spread of infectious diseases, as well as protecting human beings against noise pollution.[7,8] A healthy home should have a healthy structure, be safe, and have adequate facilities for sleep, personal hygiene, food preparation and storage, an environment for comfortable relaxation, solitude and silence, and facilities for social discussion with friends, family, and others. If the facilities and conditions are not favorable to meet the psychological needs of human beings, it provides the ground for the transmission of pathogens and endangers human health.[9] However, today in developed or developing countries, less society can claim to have solved the concerns of the house in qualitative and quantitative structures. For example, the quality and quantity of water and food consumed and the air we breathe, the physical condition of homes, the hygiene, and the density of people in the home can play an important role in tuberculosis susceptibility. The incidence of this disease in an unhealthy home is 8 times higher than in a standard home.[10,11] The home is one of the main determinants of the health of its inhabitants because it is basically a small environment to which they are constantly exposed.

Housing is one of the most important human needs, because it is considered as one of the most important components of human life.[2,8] The development of housing structure introduced concrete walls and floors and flat roofs on-site. There are several indicators for understanding the condition of a home, such as construction quality, ownership, and building history.[12] On a large scale, the function of housing is very important in socio-economic and cultural development, especially in terms of its role in creating business and investment flow and ultimately creating psychological well-being and reveals the importance of housing health. Similarly, on a small scale, achieving urban and rural development (as an important pillar of the country's economy) make housing health more important.[3,13]

Housing health assessment is a low priority for housing residents. The scope of housing knowledge required to understand the issues in this area, its threats and opportunities. Considering the mentioned cases and the importance of housing health and also due to the complexity and unknown correlation between housing and health, the purpose of this study was to investigate the knowledge and attitude of Kermanshah University of Medical Sciences (KUMS) staff about housing health in 2017.

## Materials and Methods

### Study area

This study was conducted in the Kermanshah, the 9th metropolitan of Iran. The present study is a descriptive-analytical cross-sectional study focusing on the health risks of housing. We sought to find more evidence in the scientific literature on the relationship between housing and health. To conduct this research, the staff statistics of KUMS were extracted based on the level of education through the educational development department of the university. A total of 100 staff members of KUMS were randomly selected from colleges, educational centers, and health centers and based on their degrees were classified into three subgroups: (1) Primary education, (2) diploma and postdiploma, and (3) bachelor's and higher degree.

In this study, the inclusion criteria were resident living in Kermanshah and at least 5 years of work experience in KUMS. Participants were also excluded from the study if they objected to participating in the study. The level of knowledge and attitude of people about housing health was assessed based on a researcher-made questionnaire. For this purpose, the questionnaire was distributed among the staff from December to March, and after explaining the purpose of the study, participants were asked to complete the questionnaire if they wished. In addition, it was clearly stated that our project was approved by KUMS (ethical code = KUMS. REC.1396.108) and that the confidentiality and consent of all participants were desirable. Oral consent was obtained from the respondents to participate in the study and it was ensured that the data obtained from the questionnaire remained confidential. The questionnaires were self-administered and during their completion, the necessary assistance was provided by the researcher to answer the possible questions of the participants.

### Questionnaire validity and reliability

Preparing a suitable questionnaire to assess housing health is one of the most important issues. After designing the questions related to each of the considered topics, the reliability and validity of the questionnaire were evaluated through content validity with the participation of 4 faculty members of Kermanshah School of Public Health (experts) and 4 potential participants. To convert the clarifications to a numerical scale, the relevance and clarity of each question and the overall use and accuracy of the questionnaire were divided into four categories: (1) undesirable, (2) relatively desirable, (3) desirable, and (4) completely desirable. Furthermore, the overall comprehensiveness of the tool was divided into four categories: (1) incomplete, (2) relatively comprehensive, (3) comprehensive, and (4) completely comprehensive. After collecting the opinions of experts, the accuracy and clarity of each question and the appropriateness and accuracy of the entire questionnaire were assessed and the necessary changes were applied. The relevance and overall clarity of the revised questionnaire were 84 and 86 for experts and 91 and 95 for

participants (out of 100), respectively. Furthermore, the overall comprehensiveness of the questionnaire, according to experts, was 96. Each of the above questionnaires had 2 sections of knowledge and attitude, which included 23 questions in the knowledge section and 27 questions in the attitude section, including various topics about housing health.

After confirming the content validity, the reliability of the questionnaire was determined using Cronbach's alpha coefficient to assess its internal consistency and using a test–retest in 20 people (with the distribution of initial questionnaires among 20% of suitable people) in 2 weeks apart to assess its reproducibility. In this study, Cronbach's alpha of knowledge and attitude was 0.82 and 0.85, respectively, which indicates the acceptable reliability of the questionnaire.

In the knowledge section, the questions with the correct answer have a score of 1 and the questions with the incorrect answer have a score of 0. To better assess the level of knowledge and attitude of individuals, the knowledge range was 0–23 which was 0–6, 7–12, 13–18, 19–23 were considered poor, average, good, and very good, respectively. According to the questions in the attitude section, scores of 3, 2, 1, and 0 were considered high, medium, low and never, respectively. In the attitude section, the score range was 0–81, which was considered 0–20, 21–40, 41–60, and 61–81 as weak, medium, good, and very good.

### Statistical analysis

After recording the information in SPSS software (version 18, SPSS Inc., Chicago, IL, USA), the collected data were analyzed using descriptive and analytical statistics. Parameters including mean, standard deviation, and frequency of data were calculated and variables were reported in the form of mean ± standard deviation. Then, analytical statistics tests such as paired *t*-test were performed at a significance level of < 0.05.

## Results

This study was performed among 100 personnel of the Kermanshah University of Medical Science in relation to housing health. According to the results of Table 1, the majority of the participants (60%) were selected from females and 40% of them have a tertiary education degree.

The mean score of knowledge and attitude in relation to housing health is presented in Tables 2 and 3 by the separation of each question. The results showed that mean score of people's knowledge about the housing and its effects on the health was moderate (45.37%).

Based on the obtained results from Table 4, the mean score of knowledge have a significant difference based on the male and female ($P < 0.05$). However, the attitude score among these two groups have not a statistically significant difference. The mean levels of knowledge and attitude scores based on

**Table 1: Sociodemographic data**

| Variable | Frequency (%) |
|---|---|
| Sex | |
| Male | 40 (40) |
| Female | 60 (60) |
| Educational degree | |
| Primary | 29 (29) |
| Secondary | 31 (31) |
| Tertiary | 40 (40) |

**Table 2: The mean knowledge score in relation to housing health**

| Row | Variable | Correct answers (%) |
|---|---|---|
| | Food hygiene | |
| 1 | Drying of food such as vegetables | 52 |
| 2-1 | Suitable time for cooked foodstuffs to keep at room temperature | 68 |
| 2-2 | Suitable time for cooked foodstuffs to keep in the refrigerator | 64 |
| 3 | The maximum duration of storage of food waste at home | 50 |
| | Chemical constituents | |
| 4 | Whereabouts of chemicals such as paint, detergents and etc., at home | 50 |
| | Lighting | |
| 5 | The status of light of the lamps for the rooms | 58 |
| 6 | The most illuminating in which part of the home | 60 |
| 7 | Housing structure in terms of lighting | 42 |
| 8 | Window installation | 18 |
| | Ventilation | |
| 9 | The most ventilation in which part of the home | 48 |
| 10 | Housing structure in terms of ventilation | 42 |
| 11 | Indoor air pollution | 46 |
| 12 | Biological contaminants | 48 |
| 13 | The effect of smokers on the pollutants concentration such as benzene | 38 |
| | Welfare | |
| 14 | The distance between the bedroom and living room | 52 |
| 15 | The minimum area per person | 24 |
| 16 | The most appropriate location of the bathroom | 24 |
| 17 | The number of housing rooms per family members | 42 |
| 18 | Appropriate temperature for elderly in the house | 50 |
| 19 | Suitable height of house for the safety and health of children | 60 |
| | Color | |
| 20 | The best color for the bedrooms | 32 |
| | Fire inhibition | |
| 21 | The most appropriate method for fire inhibition of the materials such as wood, paper, plastic and cloth | 46 |
| 22 | The most appropriate method for electrical fire inhibition | 36 |
| | Waste disposal | |
| 23 | Waste management priorities | 39 |

**Table 3: The mean of attitude score in relation to housing health**

| Questions | Attitude level Mean±SD |
|---|---|
| 1. Basic physical and psychological requirements | 2.72±0.54 |
| 2. Disease risks and physical and chemical hazards of unhealthy house | 2.42±0.6 |
| 3. Increasing the mortality rate related to unhealthy house | 2.3±1.02 |
| 4. The knowledge about how to use the house could affect the healthy house | 2.34±1.06 |
| 5. To what extent using the proper method of waste collecting, keeping and disposing cause the vectors growth reduction and prevent the chemical poisoning? | 2.48±0.79 |
| 6. To what extent the buildings air pollution which originated from energy producing and cooking steam devices could affect the cardiovascular disease increased? | 2.16±1.02 |
| 7. To what extent using the house as a work place could affect the inhabitant's health in terms of noise pollution and smoke? | 2.16±0.98 |
| 8. To what extent proper light supplying in house could affect the mental relaxation and accident reduction? | 2.3±0.97 |
| 9. To what extent using the light color for the upper part of the walls and ceiling could increase the lightning efficiency of the windows? | 2.18±1.04 |
| 10. To what extent the proper ventilation in house space could reduce the pollutants concentration of cooking activities? | 2.24±1.08 |
| 11. The bath and kitchen ventilation to what extent have priority in comparison with other parts of the house? | 2.26±1.1 |
| 12. High moisture content (60% and more) to what extent have affected the fungal spores growth and mold? | 2.08±1.12 |
| 13. To what extent high noise in and out of the house could affect the hearing and accuracy and psychological calmness reduction? | 2.06±1.24 |
| 14. To what extent keeping the distance between bedroom and living room and not placing the bedroom under the balcony could affect the psychological calmness and health? | 2.04±1.01 |
| 15. To what extent smoking in the house could have harmful effect on buildings air? | 2.14±0.99 |
| 16. To what extent the excessive consumption of formaldehyde resources such as resin, adhesive and some drugs could affect the pulmonary disorders? | 2.34±0.77 |
| 17. The existence of smoker people to what extent could affect the nonsmokers persons and leading to cancer? | 2.42±0.78 |
| 18. Proper ventilation deficiency, moisture and cigarette smoke to what extent could create moods such as drowsiness, headache, eyes irritation and tiredness? | 2.32±0.96 |
| 19. Using the rodenticide in close spaces to what extent could affect the exposed individual's health? | 2.36±0.92 |
| 20. The existence of adequate space for each person in the house (the proper number of rooms with population) to what extent could affected the individual's psychological health? | 2.18±1.06 |
| 21. Social issues such as murdering and other criminals to what extent are related to living in an unhealthy house? | 2.3±1.02 |
| 22. To what extent firing and physical hazards are related to unhealthy and unsafely house? | 2.24±0.89 |
| 23. The fences construction around the stairs to what extent is important in kids and olds health keeping? | 2.12±0.73 |
| 24. To what extent the existence of hood in the kitchen is necessary for food steam emission prevention? | 2.18±0.63 |
| 25. The existence of livestock in residential environment to what extent is harmful in terms of various disease incidences? | 2.37±0.53 |
| 26. Waste keeping in house to what extent is affective in vectors growth? | 2.07±1 |
| 27. The existence of seam and cracks and fractures in houses walls to what extent is dangerous in terms of providing a sanctuary for insects and rodents? | 2.05±1.02 |

SD: Standard deviation

**Table 4: The mean score of knowledge and attitude in relation to housing health**

| | Mean±SD | |
|---|---|---|
| | Knowledge | Attitude |
| Female | 19.07±1.59 | 78.08±1.38 |
| Male | 17.54±1.67 | 77.92±2.94 |
| *P* | <0.001 | 0.015 |

SD: Standard deviation

the men's and women's education degrees have shown in Table 5. The means score of knowledge in the woman's staff in the university have a significant difference based on the educational level ($P < 0.05$).

The highest score of knowledge and attitude in women is related to the bachelor and higher degree groups. The mean score of knowledge among various educational groups has statistically significant difference ($P < 0.05$). The mean scores of knowledge and attitude on Likert scale are shown in Table 6.

As shown in Table 6, the highest scores are related to men (68%) and were in a very good range. As well as the attitude score in both groups in Likert scale was 100%, and in a very good range.

## Discussion

Due to the scale of the efforts and the level of the physical and social factors, it is important to understand the relationship between housing and health. The health performance of existing housing can play a more prominent role in policy for home renovation. According to the results of the study, the mean scores of knowledge and attitude of females were higher compared to the scores of males. In the female staff of the university, the highest level of knowledge score was related to the group with a bachelor's degree or higher, and

**Table 5: The mean level of knowledge and attitude based on the male and female educational degrees in the university**

| | *n* | Knowledge | Attitude |
|---|---|---|---|
| Mean±SD of primary | 29 | | |
| Male | 12 | 16.81±1.27 | 76.23±1.32 |
| Female | 17 | 19.41±1.21 | 78.31±1.54 |
| Mean±SD of diploma and associate | 31 | | |
| Male | 13 | 17.13±1.26 | 76.75±1.12 |
| Female | 18 | 19.13±1.14 | 79.75±1.12 |
| Mean±SD of bachelor and higher | 40 | | |
| Male | 15 | 18.20±1.33 | 79.19±1.11 |
| Female | 25 | 19.20±1.34 | 79.19±1.11 |
| Total (*P*) | | | |
| Male | | <0.001 | 0.002 |
| Female | | <0.001 | <0.005 |

SD: Standard deviation

**Table 6: The knowledge and attitude mean in Likert scale**

| Sex | Good, *n* (%) | Very good, *n* (%) |
|---|---|---|
| Male (*n*=40) | | |
| Knowledge | 13 (32) | 27 (68) |
| Attitude | - | 40 (100) |
| Female (*n*=60) | | |
| Knowledge | 22 (37.5) | 38 (62.5) |
| Attitude | - | 60 (100) |

the highest scores of attitude was related to the diploma and associate degree's group. In the present study, women with academic education generally had better knowledge and attitude in this field.

The highest scores of knowledge and attitude in men were related to the group with bachelor and higher degree. The mean score of knowledge in different educational groups was statistically significant. This result was consistent with the results of Holding *et al*.[14] in the UK and Larsen *et al*.[13] in Ethiopia. According to the results, the mean score of knowledge and attitude of KUMS personnel was within the good and very good range. Respondents' awareness recommends that people at KUMS be somewhat aware of the consequences of unsafe housing, which is consistent with the results of Njoku *et al*.,[15] in South Africa. According to Ortiz *et al*.[1] the housings cost can cause people enforced to live in housing that is basically hazardous, poorly heated, unhygienic, overcrowded, or placed in geographical areas with poor conditions that adversely affect health.

In a review by Rice and Drane[16] on the effects of human health associated with the design of buildings, the results revealed that most of the indicators that are applied for health status of urban and rural families are limited to measuring communicable diseases that directly affect physical health and there are very few indicators focusing on factors affecting mental and social health and noncommunicable diseases. In addition, Oakman *et al*.[5] concluded that improvements in mental health are consistently reported after housing improvements. Furthermore, Li *et al*.[17] state that personal guidance in moving people after houses demolition reduces stress and dissatisfaction due to drastic changes in the environment. However, because of the dissimilarities in the approach used, strong conclusions cannot be obtained based on these results. Usually, this dissimilarity is caused by the population density, lifestyle, standards, and business.

Housing conditions are primarily a danger to visitors who are unfamiliar with or unaware of safety conditions. With better information, risk awareness may be established and housing conditions may slowly improve. Identifying risks and relationships is crucial to agreeing on diagnoses and measures to improve healthy housing. Air quality is the foundation of healthy housing and the most essential role for housing health is ventilation. With poor ventilation, there is a risk of excessive biological and chemical exposure. Overcrowding has been a sign of poor housing conditions and health risks for different ages. Residence is one of the most important parameters of healthy housing, however, only a few studies focus on occupancy and health. The issue of radon is well known to few but has been neglected in the design and maintenance of housing. In this research, the knowledge of individuals was asked about waste management methods. The knowledge of people about waste disposal was low (39%) which is consistent with the result of Almasi *et al*.[18] and Fattahi *et al*.[19] in Kermanshah.

In the current planning, the housing health indexes have extracted in 10 titles or field without representing the details. With the socio-economic growth and health knowledge promotion of the society, the family's housing health conditions have promoted too and the current play was not sufficient for the existence programs.[20] Azizi *et al*.[21] studied the family's housing health condition which covered by Kermanshah's Samen Al Aemeh Health Center and showed that 94% of the rooms ceiling, 93.8% of the rooms floor, 93% of the rooms light, 90.2% of the heating system, 80.4% of the cooling system, 78% of the yard, 76.2% of the windows fences, 74% of the W. C ventilation, 43.4% of the stairs fences, 36% of the rooms space, 12.8% of kitchen ventilation, 8% of the fire extinguishing equipment, 3.8% of the building have a good and proper condition in terms of being armed against mouse and rodents entrance. Informal housing constitutes 60%–90% of housing in developing countries and is outside the scope of formal planning and often has a different quality and does not meet health and sustainability requirements.[2,22]

According to this study, there are no strong laws and no reason to build a healthy house, and this problem is more serious in developing countries.[3] Other studies conducted in China, America, Spain, and Cyprus suggest a need to pay more attention to this issue.[7,23,24] To increase the public information, it is better to train them and develop the housing health projects by administrative and private sectors. Absolutely, the role of

medical universities in this regard is also significant. Hence, any form of interference and education intended to increasing the people knowledge about the housing health can play a significant role in decreasing the threat of possibly housing hazards.

However, our sample size was limited and some conditions are few. We found that we were not consider some of the most important demographic variables used for the paper's results (e.g. economic level, housing ownership status, occupation, and place of residence). In our opinion, these variables are useful for checking the validity of the results and further examining the effects of the training programs.

## Conclusion

In the present study, the level of education was statistically correlated with participants' knowledge and attitudes about housing health. Given the importance of housing and the direct relationship with health, housing health education through the distribution of brochures and social networks can improve the level of knowledge and attitude of individuals. As a result, housing health provides the expertise and capacity to diagnose problems related to housing health and urban development. Recommendations for future research include investigating the housing health status of other community groups and evaluating the effects of housing health on mortality, morbidity, and the use of health services in the country.

### Ethics code

Taken from ethical committee of Kermanshah University of Medical Sciences (KUMS.REC.1396.108).

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### Conflicts of interest

There are no conflicts of interest.

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