



HOUSING CONDITION AND ITS EFFECT ON THE HEALTH STATUS OF RESIDENTS OF RURAL AREA OF WESTERN MAHARASHTRA

Community Medicine

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ABSTRACT

Introduction: Although poverty has been reduced during the past four decades, provision of adequate housing and amenities are major challenges for human development. Staying healthy is a function of many factors among which housing condition of man is prime. Both intrinsic and extrinsic attributes of housing can impact on human health. Our aim is to examine the influence of housing conditions on the health status of residents in rural area of Western Maharashtra. **Objectives:** 1. To assess the housing conditions of the rural area. 2. To study influence of housing condition on the health status of residents. **Material and Method:** The present cross-sectional study is carried out in one of the purposefully selected villages under the service area of Rural Health Training Center of Government Medical College, Miraj. All the houses in the selected village are considered for the study. A semi structured questionnaire is used to assess housing condition. House to house survey includes information like, total family members, per capita income, overcrowding, nuisance of rodents and insects, safe drinking water supply, latrine, drainage and waste disposal conditions. Information is also obtained about any illness in the household suffered during last six months. Duration of Study: 01 December 2021 to 30 January 2022. **Statistical Analysis:** Data so collected is analyzed and percentages are calculated. Chi square test is used to know the significance between housing condition and health status of residents. **Result:** 45.5% houses have good housing conditions whereas 54.5% houses have poor housing conditions. 48.6% houses having poor housing conditions have one or other individuals suffering from illness/diseases as compared to 19.8% houses having good housing conditions which have at least one individual suffering from illness. This difference is statistically significant. Out of 401 individuals who reside in good housing condition, 77 (19.2%) suffered from disease during last six months. While out of 488 individuals having poor housing condition, 236 (48.4%) suffered from diseases during last six months. This difference is statistically significant. Infectious diseases are more common in poor housing condition as compared to those in good housing condition. Poor housing quality has been associated with numerous physical health conditions, including respiratory and other infectious conditions. **Conclusion:** It was found that more than 50% houses in the surveyed village had poor housing condition and poor housing quality was found to be associated with numerous physical health conditions, including respiratory and other infectious conditions. It was recommended others that there should be continuous public enlightenment among the people on the implication of their living conditions.

KEYWORDS

Housing condition, health status, rural area, infectious diseases.

INTRODUCTION:

Housing is the basic requirement of human wellbeing. Housing condition as a whole includes type of house, drinking water, sanitation, drainage etc.[1] Adequate housing is recognized as a basic human right by the United Nations and its constituent bodies.[2] Next to food and clothing, housing is considered the basic need of humans both from social and economic point of view.[3] Hence information regarding housing is considered as one of the key indicators for socioeconomic development.[3] The relationship between the built environment and human health is complex. The effect of housing on health has been recognized for over a century.[4] The indoor environment is very important to keep the wellbeing of individual. People spend most of their time indoors, at home.[5]

Indoor air quality, home safety, noise, humidity and mould growth, indoor temperatures, lack of hygiene and sanitation equipment, and crowding are some of the most relevant possible health threats to be found in dwellings. Physical, mental, and social health is affected by the living conditions.[4]

Research on the impact of design and quality of buildings on health and wellbeing of occupants has been widely reported.[6] The risk of asthma and other respiratory conditions have been shown to increase among children living in damp houses.[7] A number of studies have investigated the association between specific features of housing and health outcomes.[8,9] However, there is insufficient systematic review level evidence to provide a comprehensive picture of how several features of building design affect health and well-being at the population level.

The present study is conducted to assess the housing conditions of the rural area and to study influence of housing condition on the health status of residents.

OBJECTIVES:

1. To assess the housing conditions of the rural area.
2. To study influence of housing condition on the health status of residents.

METHODOLOGY:

The present cross-sectional study was carried out in one village under the Rural Health Training Centre of Government Medical College, Miraj during December 2021 and January 2022. For the present study one village was purposively selected. There were 248 houses in this village and all these houses were considered for this study. Of these 248 houses, 37 houses were found to be locked at the time of survey while in case of 11 houses detail information as per questionnaire could not be obtained due to non-cooperation of the informants. Hence these 48 houses were excluded. Thus 200 houses were surveyed for the present study. A semi-structured questionnaire was used to assess housing conditions. House to house survey includes information like total family members in the house, per capita income, overcrowding in house, nuisance of rodents and vectors, source of drinking water supply, latrine facilities, drainage and waste disposal conditions. Housing condition was personally observed by the interviewer. Information was also obtained about any illness in the household suffered during last 6 months. Data entry and analysis was done in Excel sheet. Descriptive analysis was done and percentages were calculated to represent the Data. Chi square test was used to find the significant association between housing condition and health status of the residents.

Ethical Considerations:

The following ethical issues were considered for this study:

1. No physical harm was done to the participants as there was no intervention.
2. Confidentiality was maintained throughout the study by coding

the data.

- Verbal consent was obtained from all the participants before participating in the study.

RESULTS:

Table 1: Housing condition in the surveyed village.

Parameters.		Frequency	Percentages
Type of house	Kaccha	68	34
	Pucca	132	66
No. houses with family members			
	≤ 3 Persons	43	21.5
	>3 Persons	157	78.5
No of rooms in the house.			
	<3 rooms	116	58
	≥3 rooms	84	42
Overcrowding.	Present	83	41.5
	Absent	117	58.5
Adequate Ventilations	Present	159	79.5
	Absent	41	20.5
Adequate lighting.	Present	184	92
	Absent	16	8
Per capita income (Rs).	3000 & Below	57	28.5
	Above 3000	143	71.5

Table 1 shows various housing conditions in the surveyed village. 66% of houses in a surveyed village were pucca houses which are considered to be all-weather durable and sustainable whereas 34% houses were kaccha houses. In 21.5% houses there were 3 or less than three family members residing in the house while 78.5% houses had more than three family members. In 58% houses, there were less than three rooms while in 42% houses there were three or more rooms. 79.5% houses had good ventilation whereas 20.5% houses showed poor ventilation. Overcrowding was found in 41.5% houses where as 58.5% showed no overcrowding. Overcrowding is considered to be present on the basis of available floor space.[10] Adequate lighting was present in 92% houses. Per capita per month income of 57 (28.5%) participants was below 3000 rupees while 143 (71.5%) participants had per capita income above 3000 rupees.

Table 2: Vector Nuisance and Cattle condition in study houses.

Vector nuisance / Cattles in house		Frequency	Percentages
Mosquito nuisance	Present	134	57
	Absent	96	43
Fly nuisance	Present	74	37
	Absent	126	63
Rodent nuisance	Present	58	29
	Absent	142	71
Pets in house	Present	78	39
	Absent	122	61
Cattles within 50 m distance	Present	75	37.5
	Absent	125	62.5

Table 2 shows vector nuisance and Cattle condition in study houses. 57% houses showed mosquito nuisance and 37 % houses showed fly nuisance. Rodent nuisance was present in 29% houses. 39% houses had pet animals. 37.5% houses had cattle shed within the premises of 50 meters.

Table 3: Kitchen condition, food stored and drinking water facilities in the houses.

Parameters		Frequency	Percentages
Separate kitchen	Yes	160	80
	No	40	20
Adequate ventilation in kitchen area	Yes	157	78.5
	No	43	21.5
Supply of LPG fuel for cooking	Yes	197	98.5
	No	3	1.5
Cooked food stored	Closed	194	97
	Open	6	3
Uncooked food stored	Closed	189	94.5
	Open	11	5.5
Supply of safe drinking water	Yes	125	62.5
	No	75	37.5
Water stored	Closed	193	96.5
	Open	7	3.5

In the surveyed village, 80 % households had separate kitchen. 78.5% houses had adequate ventilation in kitchen area. In 98.5% households LPG was used as a fuel for cooking. 97% houses had good storage facility for cooked food. In 94.5% houses uncooked food items were stored in closed containers. 62.5% had continuous supply of safe drinking water while satisfactory water storage facilities were observed in 96.5% houses.(Table 3)

Table 4: Drainage and waste disposal facilities in houses

Parameters		Frequency	Percentage
Separate bathroom	Present	92	35
	Absent	108	65
Latrine facility	Present	184	92
	Absent	26	8
Waste disposal in side house	Open	11	5.5
	closed	189	94.5
Waste disposal outside house	Daily	170	85
	Once in 2-3 days	30	15
Methods of waste disposal	Garbage pit	60	30
	Other	140	70
Types of drains	Open	47	23.5
	closed	153	76.5

Table 4 shows drainage and waste disposal facilities in houses. 35% households had separate bathrooms and 92% had latrines. Waste disposal in the house was of open type in 5.5 % houses while in 94.5% houses waste was store in closed container for further disposal. Waste was disposed daily in 85% cases while in 15% cases it was disposed of every 2 to 3days. 30% households disposed waste in garbage pit while 70% disposed it nearby open places. 76.5% households had closed types of drains in their homes.

Table 5: Impact of housing conditions on health status of residents during last sixth months

Parameters	No. of houses having ill persons	No. of houses without ill persons	Total
Good housing conditions	18 (19.8%)	73 (80.2%)	91(100%)
Poor housing conditions	53 (48.6%)	56 (51.4%)	109 (100%)
Total	71 (35.5%)	129 (64.5%)	200 (100%)

For the present study Good housing is considered to be present if there is no overcrowding in house, no nuisance of rodents and vectors, no animals within 50 meters of house and the house is pukka house with proper ventilation and lighting, have source of drinking water supply, separate kitchen, latrine facilities, closed drainage and waste disposal facilities. If any of these is absent then the housing condition is considered as a poor housing.

Of these 200 houses surveyed, good housing condition was found in only 91(45.5%) houses, whereas in 109 (54.5%) cases the housing condition was poor.

Out of 91 houses with good condition, 18 (19.8%) houses had one or other individuals suffering from illness or disease while out of 109 houses with poor condition, 53 (48.6%) houses had one or other individual suffering from illness/disease during last six months. This difference is statistically significant. ($X^2 = 18.02$, $df=1$, $p<0.05$, Significant)

Table 6: Distribution of ill/disease persons as per the housing condition

Parameters	No. of persons having illness	No. of persons without illness	Total
Good housing conditions	77 (19.2%)	324 (80.8%)	401 (100%)
Poor housing conditions	236 (48.4%)	252 (51.6%)	488 (100%)
Total	(35.2%)	(64.8%)	889 (100%)

There was total 889 residents in these 200 houses. Of this, 401 (45.1%) individuals had good housing condition while 488 (54.9%) had poor housing condition. 77 (19.2%) individuals from good housing condition suffered from disease during last six months. While out of

488 individuals having poor housing condition, 236 (48.4%) suffered from diseases during last six months (Table 6). Percentage of individuals suffering from illness or disease was more in poor housing condition as compared to those belonging to good housing condition. This difference is statistically significant. ($\chi^2 = 82.0$, $p < 0.05$, Significant)

Table 7: Housing condition and type of diseases.

Parameters	No. of persons having non communicable diseases	No. of persons having communicable diseases	Total
Good housing conditions	45 (58.4%)	32 (41.6%)	77 (100%)
Poor housing conditions	102 (43.2%)	134 (56.8%)	236 (100%)
Total	147 (47.0%)	166 (53.0%)	313 (100%)

134 (56.8%) individuals from poor housing and 32 (41.6%) individuals from good housing suffer from Infectious diseases like typhoid, malaria, covid-19, diarrhea, tuberculosis, worm infestation etc. 45 (58.4%) individuals from good housing and 102 (43.2%) from poor housing had non communicable disease like hypertension, diabetes, thyroid etc. Infectious diseases are more common in poor housing condition as compared to those in good housing condition. ($\chi^2 = 5.4$, $df = 2$, $P < 0.05$, significant)

DISCUSSION:

Along with food and clothing, housing is one of the basic need of human being. Adequate housing is an important factor in the overall growth and development of an individual wherewith he can enjoy both mental and physical health and live in a state of security, peace and dignity.

In the present study 45.5% houses were found to have good housing condition whereas 54.5% houses had poor housing condition. Our study findings are comparable with the findings of survey carried out by Seema and also reported by NSS survey. In rural areas, about 46 per cent houses are in good condition as per census 2011. In Maharashtra, 56.54 % houses in rural areas are in good condition.[11] According to NSS survey all five facilities (House with five basic facilities such as drinking water, ventilation, electricity, no overcrowding and sanitation has good housing condition.) were enjoyed by 68% households.[1]

Number of dwelling rooms in a house is an important indicator and denotes the congestion in the house. Each couple in a house requires a dwelling room for their privacy and a quality living. In spite of having larger average household size in rural areas, rural houses had lesser number of dwelling rooms. In our study 58% of the houses had less than 3 rooms. Overcrowding was found in 41.5% houses where as 58.5% showed no overcrowding. Overcrowding is considered to be present on the basis of available floor space. Overcrowding is a health problem in human dwellings. It may promote the spread of respiratory infection such as tuberculosis, influenza etc.[10]

Residential space of a person's home plays a central role in shaping his health and well-being.[12] Abhay Kumar et al in their study found 65.8% Pucca houses, which are considered to be all-weather durable and sustainable, in rural areas. [13] In present study, percentage of pukka housing was 66%. Rural areas lagged behind in terms of houses with separate kitchen. Overall, only 47.4 per cent rural houses had separate kitchen. [13] This finding is contrary to the finding of present study. In present study, 80% houses had separate kitchen.

Rural houses have an additional requirement for animal shed/poultry farm facilities. [13] In our study 37.5% houses had cattle shed with a distance of 50 meter. By and large, it was observed that 62.1 per cent of the rural households had some form of such sheds either attached to the house or detached from it Apart from housing conditions, its amenities too are an integral part of housing environment. Key amenities such as drinking water, sanitation, electricity, drainage system, approach road to house etc. are indispensable for any house today.[13]

As far as safe drinking water is concerned, its availability in rural houses was 88.5 per cent[13]. Our study also showed that 62.5% houses in rural area had source of safe drinking water.

Sanitation facilities are an important prerequisite for safe and sustainable housing conditions. Access to proper sanitation is not only linked with hygiene and cleanliness but also with dignity. In sanitation, we have looked into the availability of latrine facilities, bathroom facilities and drainage facilities. [13]

In present study, 92% houses had latrine facilities and 35 % houses had separate bathroom facilities. 60.2 per cent of the rural houses did not have any latrine. Almost a similar pattern was observed for bathroom facilities as well. In the rural areas, only 15.5 per cent houses were having bathrooms attached to them. [13]

In the availability of drainage facilities in the houses, only 15 per cent houses in the rural areas were found to be with covered drainage system.[13] In present study, 76.5% % houses have closed drainage facilities. This may be because of sanitary awakening campaign launched by government in recent years.

Availability of electricity is another important need of any modern household. Nearly one-fifth of the total rural houses did not have electricity.[13] In present study, 8 % houses are still ill lighted.

Housing is often cited as an important social determinant of health, recognising the range of ways in which a lack of housing, or poor quality housing, can negatively affect health and wellbeing [14,15,16,17]. The causal relationships between tangible physical housing defects and poor health outcomes are widely accepted.[18,19] In the present study it was found that 19.8% houses with good housing condition, had one or other individuals suffering from illness or disease while 48.6% houses with poor housing condition, had one or other individual suffering from illness/disease during last six months We also found that percentage of individuals suffering from illness or disease was more in poor housing condition as compared to those belonging to good housing condition. Again, we observed that Infectious diseases were more common in poor housing condition as compared to those in good housing condition.

Researches such as Easterlow [20], Ineichen [21] Matte [22], and Harka [23] have shown that there is a link between the health status of people and their housing condition.

Good physical and mental health depends on having homes that are safe and free from physical hazards. Krieger and Higgins[24] and Shaw[25] opined that adequate housing can protect individuals and families from harmful exposures, provide them with needed privacy, security, stability, control and capable of making significant contribution to health; contrariwise, when the condition of housing is poor and inadequate, it may result in infectious and chronic diseases, injuries and poor childhood development.

Tomlinson described the link between poor housing conditions, HIV and AIDS as multiple and complex. For example, high densities, overcrowding and housing conditions increase the risk of opportunistic infections. Inadequate water and sanitation increase the probability of being infected and pose challenges to provision of home based care.[26] Cooper et al. established that overcrowding and some other aspects of a poor home environment contribute to mental stress and reduce people's sense of general wellbeing. [27]

Krieger and Higgins attributed cold indoor conditions with poorer health and increased risk of cardiovascular disease.[28] Agbo et al. established that some health disorder such as typhoid and paratyphoid fever, diarrhoeas, dysenteries, cholera, hookworm, ascariasis, viral hepatitis, guinea worm diseases, schistosomiasis, genito-urinary tract infections and many other intestinal and parasitic infections can be contacted through poor toilet facilities which may be a breeding ground for harmful bacteria, viruses and parasites.[29] A survey conducted in four area of Ghana revealed that the factor that were perceived as causing malaria include mosquitoes, flies, dirty surroundings, unsafe water, bad air and poor hygiene. All these have link with poor housing condition.[30].

The invasion of the home by harmful insects and pests is a direct threat to health, as pests can function as carrier of pathogens, diverse diseases, and allergens. Next to the influence on hygiene conditions in general, many of these pests may have a parasitic relationship with humans that will enable them in affecting their health [31] The existence of cockroaches and other insects strongly depended on the

housing characteristics and was favoured by, for example, inadequate bathroom installations, problems with the water drainage system, dirty waste chutes located outside the dwelling, improper maintained kitchen, poor bathroom etc. Regular and adequate maintenance work of the building was, therefore, identified as one of the major control mechanisms for the prevention of infestations. [32]

Features of substandard housing, including lack of safe drinking water, absence of hot water for washing, ineffective waste disposal, intrusion by disease vectors (e.g., insects and rats) and inadequate food storage have long been identified as contributing to the spread of infectious diseases.[33]

Crowding is associated with transmission of tuberculosis[34] and respiratory infections[35] Many of the diseases directly or indirectly related with sanitary conditions. The list of diseases as Cholera, Hepatitis, Dengue, Malaria, Scabies, Ascariasis, Typhoid, Shigellosis and JE etc. reduced with proper access to sanitation and hygiene.[36] In more recent years, epidemiological studies have linked substandard housing with an increased risk of chronic illness. Damp, cold, and mouldy housing is associated with asthma and other chronic respiratory symptoms. [28,37]

CONCLUSION:

In present study it was found that more than 50% houses in the surveyed village had poor housing condition and poor housing quality was found to be associated with numerous physical health conditions, including respiratory and other infectious conditions. It was recommended others that there should be continuous public enlightenment among the people on the implication of their living conditions in rural areas. The government should continue on programs that enhance the economic status of households and improvement in the economic status of households will impact positively on their housing condition.

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