Assessment of Housing Conditions among the Residents of a Village in Rural Karnataka

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ABSTRACT

Introduction: Poor housing conditions contribute to respiratory infections, skin diseases, injuries, mental illness.

Objective: To assess the housing standards of the residents of Mugalur village, Sarjapur PHC, Bangalore.

Methodology: A cross-sectional study was conducted among residents of 252 households in Mugalur village. A structured, face-validated questionnaire was developed to assess the housing conditions and scored on a scale of 0-20 with a higher score depicting better housing conditions.

Results: The mean family size was 3.7 + 1.6, 222(88.1%) had Below Poverty Line card. The mean housing standard score was 12.0 + 2.5, 151(59.9%) houses were pucca. For drinking purposes, 138(54.5%) of the households bought water from Community Reverse Osmosis plant. Most of the households did not have exhaust vent 132(52.4%), adequate setback 133(52.8%) and waste segregation 169(67.1%). Toilet facility was present in 193(76.6%) of the households. The criterion for adequate sanitation was met by 35(13.8%) of the households, 252(100%) practiced inappropriate waste disposal. There was a significant association between the duration of stay and the mean housing standard score.

Conclusion: The mean housing standard score was 12.0 + 2.5 out of a total score of 20. Areas for improvement were solid waste management and sullage disposal.

Key Words: Housing Standards, Rural

INTRODUCTION

International human rights law, Universal Declaration of Human Rights and International Covenant on Economic, Social and Cultural Rights recognizes everyone's right to have an adequate standard of living including adequate housing. India is a signatory to various international treaties and covenants that endorse the right to housing[1].

The right to adequate housing contains right to choose one's own residence, protection against forced removals, arbitrary destruction or demolition of one's home and the right to be free from interference[2]. Addressing housing issues suggests public health practitioners a possibility to address an important social determinant of health[3]. Adequate housing includes entitlements like security of tenure, land and property restitution, equal and non-discriminatory access to adequate housing and must provide more than four walls and a roof and protect against forced evictions[2]. Recommendations for rural housing standards are a minimum of two living rooms, ample verandah (sit out) space, built-up area of house to not exceed one-third of total land area, separate kitchen with paved sink or platform for washing utensils, tube well or dug well within quarter mile from house, cattle shed to be at a minimum distance of 25 feet from the house, window area to be at least 10% of floor area, presence of sanitary latrine, provision for proper waste disposal[4].

Rural communities have various issues that are peculiar to their community in comparison to urban communities by virtue of differences in socio-environmental circumstances. Environment and housing conditions are divided into micro and macro environment. Microenvironment includes the immediate internal environment which consists of floor space, window space, door space, water and sanitation, and macro environment includes location of house, nearby facilities, road leading to the house, vector breeding sites and many more[5].

According to the physical condition of the structure of the building, houses are classified into kutcha, semi pucca and pucca houses. More than 50% of the total households in India are rural. According to the 2011 Census, the total number of households was 246.69 million, rural households were 68% and all-India average household size was 4.9 persons[6]. Poor housing can lead to many infectious diseases like respiratory infections, skin infections, accidents and many more[7]. The Government plays a vital role in improving housing conditions. They have introduced social housing schemes, established both minimum and maximum standards, and created a financial institution to help low-income people obtain credit for building their houses[8]. The Nirmal Bharat Abhiyan has been updated into Swachh Bharat Mission (Gramin), launched on 2 October 2014 on Gandhi Jayanti which aims to make India an open defecation free country in next Five Years. It seeks to improve the levels of cleanliness in rural areas through Solid and Liquid Waste Management and making Gram Panchayat Open Defecation Free (ODF), clean and sanitized[9]. Most rural households generate organic waste which is environment-friendly. Hence composting is a major method of solid waste management in rural communities[10].

According to Sustainable Developmental Goal (SDG) India Index baseline report 2018 developed by National Institution for Transforming India (NITI) Aayog 32% of the districts in India are Open Defecation Free, 82.72% of rural households have individual household toilets,71.8% of rural population in India has access to safe and adequate drinking water, 43.8% households use clean cooking fuels like LPG/natural gas and biogas,95% of households have access to electricity[11].

Data on housing standards are available from Census 2011 and SDG but housing scores are not available. Different standards are existing for housing but there are no scores available.

Objective of our study was to assess the housing conditions of the residents of Mugalur village.

METHODOLOGY

A cross-sectional study was done in Mugalur village among 252 households covering a population of 1600. The data was collected based on the Community Health Training Health Centre, Mugalur Health Information System and Management (HMIS) records. The study was conducted during July-September 2019. Different standards are existing for housing but there are no scores available. Therefore a self-administered, pretested, structured, face validated nineteen item questionnaire was developed to assess the housing and environmental conditions. Each item was scored as 1 or 0 based on the presence or absence of the standard criterion as defined in the rural housing standards. The final score was a sum of these and ranged from the highest of 20 to the lowest score of 0. A Consecutive sampling technique was used. Ethical approval was obtained from the Institutional Ethical Committee, St. John's Medical College Bangalore. All houses in Mugalur village were included and verbal consent was obtained by the interviewer after explaining the objectives of the study.

The following tools were used to collect the required study information,

The first part reflected on Socio-demographic details like type of house, type of card, monthly income, and standard of living index.

The second part was on housing and environmental conditions which was further subdivided into the following:

a) Housing- data on the type of house, overcrowding, ventilation, and cross ventilation was obtained[12].
b) Water and sanitation- data on drainage of sullage and sewage, source of water for drinking and household purpose were collected.
c) Solid waste management- data on segregation of dry and waste and mode of disposal were obtained.
d) Vector breeding sites: Inspection for the presence of vector breeding sites was done by the interviewer.

According to the SDG India Index baseline report 2018, 82.72% of the rural households had individual toilet facility. Using this, to estimate the housing standards with 5% absolute precision and 95% confidence level and 10% inflation the sample size calculated was 252[11]. Data were entered in Microsoft Excel and analyzed using *Statistical Package for the Social Sciences (SPSS)* version 16. Continuous variables were analyzed using percentages, mean, standard deviation and z-scores. Housing standards score was computed as a continuous variable and analyzed using mean, median and standard deviation.The results were depicted in tables and graphs. The association between socio-

demographic details and mean housing standard score was analyzed using Independent sample t-test and One Way ANOVA as applicable. A p value of < 0.05 was considered statistically significant for all analysis.

RESULTS

A total number of 252 households were studied. The mean members in each family were 3.7 + 1.6 and the median number of rooms was 2.1 + 2.0, 244 (96.8%) households were Hindu, 222 (88.1%) had below poverty line card, 21 (8.3%) had no card. The socio-demographic details of the study households are depicted in Table 1.

The criteria for Housing standards are depicted in Table 2. There was no overcrowding according to the floor space in 177 (70.2%) households, criteria for adequate ventilation was met by 222 (88.1%) households, 193 (76.6%) had adequate cross ventilation, 226 (89.7%) had electricity for domestic usage, 108 (42.9%) had indoor air pollution, had adequate setback 133 (52.8%). Separate kitchen was present in 240 (95.2%) households for cooking, 132 (52.4%) did not have exhaust vent and 169 (67.1%) households had no waste segregation. Inappropriate disposal of waste was practiced by 252 (100%) of the households. Separate toilet facility was present in 193(76.6%) of the households. The criterion for adequate sanitation was met by 35(13.8%) of the households. The mean Standard of housing score was 12.0 + 2.5.

For drinking purposes, 138 (54.5%) of the households bought water from the Community Reverse Osmosis plant and 124 (49%) of the houses procured water from the public tap for purposes other than drinking. The criteria for adequate sanitation of having water all the time in the toilet and the presence of water seal was met by 35 (13.8%) households. About 69 (27.3%) of the households owned one or the other livestock like cattle, dog, goats, cat, birds. More than 50% of the households owned two-wheeler for transport.

The association between various sociodemographic details and mean housing standards were analyzed and shown in table 3.

Significant association between the Standard of Living Index and Mean standard of housing score was found using one way ANOVA (p value: 0.042).

As the socioeconomic status increases the standard of housing score also increased. There was also a significant association between the duration of stay in the current house and the Mean standard of housing score using and Independent t-test (p value: 0.021). As the duration of stay increased the standard of housing score also increased.

Table 1: Socio-demographic details (n=252)

Variable	Households (%)
Religion	
Hinduism	244 (96.82)
Muslim	8 (3.17)
Socio-Economic Status	
Upper class	11 (4.4)
Upper middle class	29 (11.5)
Middle class	79 (31.3)
Lower middle class	82 (32.5)
Lower class	51 (20.2)
Standard of Living Index	
Above Poverty Line	9 (3.6)
Below Poverty Line	222 (88.1)
No Card	21 (8.3)

Table 2: Criteria for housing Standards

Variable	House (%)
Microenvironment	
Type of house	
Kaccha	31 (12.3)
Semi pucca	70 (27.8)
Pucca	151 (59.9)
Overcrowding according to floor space	75 (29.8)
Adequate Ventilation	222 (88.1)
Adequate Cross Ventilation	193 (76.6)
Electricity available for domestic use	226 (89.7)
Separate Kitchen for cooking	240 (95.2)
Platform for cooking available	245 (97.2)
LPG for cooking	240 (95.2)
Exhaust vent in kitchen	120 (47.6)
Indoor air Pollution present	108 (42.9)
Set back present	119 (47.2)
Waste segregation at household level	83 (32.9)
Pests inside the house	112 (44.4)
Presence of toilet for the households	193 (76.6)
Drainage of sewage to septic tank	157 (62.3)
Drainage of sullage to septic tank	156 (61.9)
Macro-environment	
Presence of Cattle Shed	48 (19)
Presence of Vector breeding site	97 (38.5)
Road leading to house cemented	202 (80.2)

Table 3: Association between Socio-economic status and Mean standard of housing (n=252)

Variable	Housing Standards (mean+SD)	P value
Religion		
Hindu	12.8 + 2.3	0.278*
Muslim	13.7 + 2.0	
Type of card		
Above Poverty Line	11.2 + 2.4	0.109*
Below Poverty Line	12.9 + 2.3	
No Card	12.8 + 2.1	
Standard of Living Index		
Low class	10.7 + 2.7	0.042*
Middle class	12.8 + 2.3	
High class	13.0 + 2.2	
Duration of stay in the current house		
Less than 1 year	11.8 + 2.3	0.021**
More than 1 years	12.9 + 2.3	
*One way ANOVA	**Independent t-test	

DISCUSSION

Mean housing standards in our study were fairly good as depicted by mean housing standard score 12.0 + 2.5 out of 20. According to Census 2011, 21% of total rural houses were of kutcha type and 43% were pucca[6], our study found 59.9% houses were pucca and 12.3% were kaccha which is due to subsidy based programme (Pradhan Mantri AwasYojana- Gramin), under which government is providing assistance to rural BPL families for constructing their own dwelling. A total of 16 million houses have been constructed since April 2014. The number of kutcha houses has come down from 9.6% to 5.9%[13]. According to the Census 2011, 95% of rural households were living in their own dwellings, 3% had rented accommodation[6]. Our study found 69% of the houses were owned and 31% were rented this could be due to the migratory population living in the rented house. According to the Census 2011, the number of households having one dwelling room was 37%, two dwelling rooms were 32%, there was 14% and having four and more dwelling rooms was 13%[6]. In our study 23.8% had one dwelling room, 46.4% had two dwellings, 21.8% had three and 7.9% had four and more dwelling rooms.

To define it as not overcrowding the accepted standard of floor space per person is 70-90 sq feet per person[12], based on this criteria, our study reports no overcrowding in 70.2% households.

Our study found 222 (88.1%) households had adequate ventilation, 193 (76.6%) cross ventilation, 108 (42.9%) indoor air pollution, 240 (95.2%) separate kitchen for cooking and 226 (89.7%) electricity. Electricity is considered as one of the important facility to the households. The relative usage of electricity for domestic purposes has increased. The National Sample Survey report on housing conditions reveals that the use of electricity for lighting in rural areas has increased from 37.3% in the 2001 census to 66% in the 2011 census[6], whereas according to National Family Health Survey 4 (NFHS-4), 83% of the rural households had electricity[14]. According to the study on Housing Condition in India 55% of the households had reported no kitchen in rural India[15]. Most of the households did not have exhaust vent 132(52.4%), adequate setback 133(52.8%) and waste segregation 169(67.1%). Separate toilet facility was present in 193(76.6%) of the households. The criterion for adequate sanitation was met by 35(13.8%) of the households.

According to the Census 2011, rural households using firewood, crop residue, cow dung cake, coal, lignite, and charcoal for cooking were 86%, following 11% usage of LPG and kerosene was used by 1% of the households[6]. Our study reports 94.8% used LPG as a main source of fuel for cooking, the remaining 5.2% used either cow dung cake or kerosene or crop residue for cooking. The sharp rise in usage of LPG is in the year May 2016; LPG connections were distributed to BPL families[6] under Pradhan Mantri Ujjwala Scheme. The aim main was to prevent indoor air pollution which leads to respiratory illness.

In our study, 27.3% of the houses owned one or the other livestock like cattle, dogs, goats, cats, and birds. They play a vital role in social, economic and cultural aspects for rural households. They improve the income of the family. They also help the family through the food supply, improving family nutrition, better family income, asset savings, family and community employment, ritual purposes and social status[16]. As a mode of transport 52.8% of houses had two-wheeler. Whereas according to Census 2011, 2% owned four-wheeler, 46% used cycle and 4% owned two-wheeler as a mode of transport[6]. A study conducted by International Association of Public Transport (UITP) in rural areas of India, the most common mode of transportion to work was bicycle 13.2%, followed by bus 11.4%, 7.5% used two-wheeler like moped, scooters, and motorcycles, and 1.5% used four-wheeler as a mode of transport[17].

Census 2011 included taps, hand-pumps, and tube wells together were the major sources of drinking water in rural areas[6]. According to the study done by Anjana Kuberan et al 42% of drinking water procurement was from public tap/stand-pipe and 37% was from tube well/borehole, 95% of them fetched water within the premises[6]. According to the Global water forum, 30.8% of rural households reported tap water as the main drinking water source[6]. A survey conducted by National Statistical Office (NSO) on Drinking Water, Sanitation, Hygiene, and Housing Condition as a part of 76th round of National Sample Survey (NSS) during July-December 2018 reported 42.9% of the households in the rural areas use hand pump as the primary source of drinking water, out of which about 87.6% of the households in the rural area had sufficient drinking water throughout the year from the primary source[18]. Our study found 54.5% of rural households used the Community R.O plant as the main source of drinking water and 49% acquired water from the public tap for other purposes. The drinking water situation in the country is seeing major changes today. In the past fifty years, there was an increasing reliance on groundwater for drinking and domestic purposes[19]. This local groundwater is the only long term solution for many areas. Treatment of this is essential to get rid of biological and chemical contamination of the water. The Government of India has launched the National Rural Drinking Water Quality Monitoring and Surveillance Programme in February 2006. This main purpose was to monitor and survey

drinking water sources by Gram Panchayats and Village Water and Sanitation Committees, at the grassroots level[20]. For the benefit of the community, government had launched first the Reverse Osmosis (RO) plant for the purification of water in the year 2000 in Gujarat, India. Approximately 325 RO Plants were functioning by 2010[21]. In the last few years, the Government of India had launched many RO plants in rural areas which could be the reason that the source of drinking water has changed from piped water to RO water.

Census 2011, reports 19% of the households had access to a water closet latrine, 10% to a pit latrine and 0.8% had access to other types of latrines. There were 69% of the households were having no latrine facility within the house[6]. Our study reported 1.2% had no latrine facility, 79.4% had a squatting type of toilet, 16.1% had western commode and 2.8% had both squatting and western type of latrine. At present 98.3% had access to toilet facility (separate + shared) compared to the 2011 census. Separate toilet facility was present in 193(76.6%) of the households. The criterion for adequate sanitation was met by 35(13.8%) of the households. Our study reported 89.7% of the households practiced indiscriminate disposal of waste and 10.3% disposed into community bins.

CONCLUSION

The mean Housing Standard score was 12.0 + 2.5. The housing standards were significantly better in those where the family resided for more than one year. There was a statistically significant association between the Standard of Living Index and mean housing standards. In coordination with Grama Panchayath solid waste management, segregation of waste at the household level and drainage of sullage should be improved.

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