

Aging in Place: Elderly Friendly Residential Environments

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Brief biography:

Ar. Chinmayi Mali has completed her Masters in Sustainable Architecture from Bharati Vidyapeeth College of Architecture, (Deemed To Be) University, Pune in 2022. She completed her bachelor's degree from B. K. P. S. College of Architecture. Currently she is working as Green Building Analyst. She carries a will to build with complete responsibility towards society.

Abstract:

Man spends a lot of money on building his own house. The population below age 20 years spends most of their day in schools and colleges, the people from age group 20 to 60 is the working class. So the population with age group above 60 usually spends most of their time inside the house. Human body degrades in physical strength and capabilities with age. With aging, many limitations in physical movement are faced, changing the perception and utility of spaces in the houses which is usually excluded during the construction.

The research intends to focus on the problems faced by aging population due to physical issues related to mobility as a result of growing age, while using the existing residential built environment. The paper is a part of the study conducted to understand the factors impacting the aging population in residential premises. The research focuses on design and other internal parameters to be considered during the construction stage of residential bungalows for the city of Kolhapur.

Keywords:

Elderly friendly environment, residential environment, physical immobility, physical constraints, aging.

Introduction:

Building one's own house is always a human dream and lots of money is invested for the same. While building a house there are many considerations like economy, social status, climate, Vastushashtra, etc. that govern. Human body degrades its strength with aging. Also lacking energy in body and energy leak increases with aging. The elderly population (age group above 60) usually spends most of their time inside the house due to restricted physical movements and also retirement. However the houses that are built in young age and with other constraints may not have given consideration to needs of the elderly inspite of guidelines for elderly.

The aim of this paper is to identify various areas of house design that need architect's attention. Accessibility audits were conducted for identifying various spaces needing attention while building the houses for the eventually aging population and appropriate suggestions are covered in this paper.

Literature Review:

According to the Census 2011 of the India the total population with age above 60 years is 8%. Also according to the Indian law, the any citizen of India who is of the age above 60 years is a 'senior citizen'. In 1968 Bureau of Indian Standards has published an Indian Standard Code (IS 4963) which was again revised in 1992. The code talks about universal designing and applies to all the buildings and facilities used by the public. But, still the code is not applicable for any private buildings like residential bungalows. In 1968 a Guideline and Space Standers for Barrier Free Environment were published by Central Public Works Department. But, these guidelines are used and considered as design support as they are not mandatory to follow. (Solanki & Khare, 2018).

So, in India there are several guidelines, acts and norms for development of barrier free built environment applicable to public buildings. But there are no norms in place for the small residential built environments or other private buildings. So the mobility issues faced in the residential Buildings have never given a thought by many people. There are many diseases which are generated in human body. One of the common diseases which hampers the human movement are Arthritis and Osteoporosis.

Material and Methodology:

The research was conducted in two steps. The study uses a case study approach. Various experts, doctors and elderly were first interviewed in the city of Kolhapur to know problems

faced with aging in physical movement. To understand their relation to build environment architects were interviewed. To know whether the bungalows are elderly friendly a tool that was developed based on the literature and interviews. The bungalows were evaluated for elderly friendly environment by auditing.

Following points were underlined by the various experts.

1. Physiotherapist

‘As a body age, the bones start getting porous and joints get stiff. The weight of our whole body falls on our knee and hip joints, making them the crucial junctions. So, for elderly people, the walking, getting up from bed, toilet seats or from seating postures becomes very difficult. As those are the main activities from day-to-day life, these should be taken care of.’

2. Doctor

In the interview with orthopedic doctor he highlighted following points -

‘Most of the times the indoor accidents causing with elderly people happen in bathrooms, toilets or other slippery areas. Even these small accidents can cause severe injuries ranging from hairline cracks to breakage of the hip joint. Also in old age, the healing rate of the body is lowered drastically, so provision of anti-skid tiles, grab bars and well-designed bath areas is must.’

3. Architects

In the interview conducted with an architect, it was understood that the people from higher middle class are more curious and consider the age factor while constructing the house. They demand for extra kitchen platform where they can sit and cook. Now-a-days, people from higher middle class ask for the provision of lifts. Also, implementation of western water closets in toilet is very common for this income group. People are shifting towards small and easy to maintain houses from big bold houses.

But People from lower middle class usually don't consider the growing age and parameters like multiple levels inside the house, Indian WC, glossy finished slippery tiles are demanded by many of them.

4. Researcher in universal design

In the interview with researcher in universal design it was stated that, with aging the body starts lacking in energy, energy leak increases day by day. Because of that the person is secluded and the living right of him is taken off. The person becomes unable to perform his or her day to day activities from going outside to get some fresh air or to open the twistable handles of his own bedroom's door. Hence every architect should think of functionality than aesthetics. In residential areas the material finishes and tiles plays very important role. The

material which would be skidding for an elderly person as he cannot have a good grip of his stick could be anti-skid for the person wearing shoes. So the material finishes should be decided according to the use of the space and also aging of the person.

5. Elderly population

Total 22 people, with age above 60 years were interviewed. The major findings were that, out of 22 responders 20 faced some or the other problems which could prove that they have arthritis or osteoporosis: only one responder considered the aging while construction, but he had built the house at age above 60. 4 people had some considerations about aging while construction who were either very young at the time of construction and had elder parents in house or who had built the house after 45 years age. Out of all the responders 20 were facing some or the other difficulties while using their houses because of aging. Even though the problems were faced by almost all the responders only 8 people have made changes in houses to sort them.

From the interviews and literature review the factors to be considered while designing and constructing the house which can impact accessibility of aging population were identified and a tool was created to understand which places in the house are usually neglected the most. Total 9 cases with owners of different age and background were studied. The cases were selected by convenient sapling. Following are the 4 categories under which the case studies could be segregated

1. Built in younger age and the owner is currently above 60 years.
2. Built in younger age and the owner is currently below 60 years.
3. Built in younger age and is renewed in older age
4. Built in older age and is still in use.

By the check list the issues were categorized as Permanent, Temporary and minor. The classification only represents the building design stage integration of the problems. Where permanent is the one which requires construction changes and should have been considered while designing stage only. Eg. Raiser of the staircase. Temporary includes the problems which require lesser time, construction changes and could be implemented easily by few constructional changes. Eg. Type of flooring. Whereas minor referred to the issues which could be resolved with minor efforts and changes. Eg. Addition of grab bars in bathroom.

Results and discussion:

Following was the check list used to analyze the cases and its results.

	Building design stage integration	Percentage of cases where the aspects are implemented
Question	Permanent/ Temporary/ Minor	%
Entrance		
Steps	P/T/M	%
Do the steps have non-slippery, uninterrupted railings on both sides	T	22
Are all the steps of equal size	P	67
Is the nosing of the steps curved or finished well.	T	89
Is the trade more than or equal to 300mm and raiser lesser than or equal to 150mm	P	33
Are the steps non-circular and closed (closed riser)		100
Are the steps covered	T	89
Are the steps adequately lit	T	67
Ramp		0
Veranda		
	P/T/M	%
Is the main entrance and veranda covered	T	88
Does it have anti-skid finishes to avoid falling and the injuries	T	13
Is the veranda at single level		100
Main Door		
	P/T/M	%
Is a landings in front of door of minimum 1200 width available	P	89
Are the door handles lever type and easily twistable	T	78
Is the door width equal to or greater than 900mm		100
Are the door fixtures, handles and locks between height 800 to 1200mm	T	89
Is the door double panelled	T	33
Does the door open inwards	T	78
Control and operating mechanism		
	P/T/M	%
Are the light switches near the door and easily visible and accessible		100

Living Room		
Planning	P/T/M	%
Is the whole area at single level	P	89
Does the room share same level as other connecting rooms	P	78

Furniture		
Are the legs of the furniture rounded.	T	78
Is the seating height greater than or equal to 450mm	T	33

Control and operating mechanism	P/T/M	%
Are the light switches near the door and easily visible and accessible	T	89

Kitchen		
Planning	P/T/M	%
Is the whole area at single level		100
Does the room share same level as other connecting rooms	P	67
Is the kitchen platform height adequate (round the waist of the female working)	T	89
Are the sides of work triangle (Fridge, Platform, sink) should be lesser than 2100, 2100, 2700 mm	M	89
Is the kitchen platform of L, line or U shaped and not island type		100
Is the storage accessible for the lady working	T	89
Does the sink have adequate height and platform should have gradient towards sink	T	78

Door		
Is there uninterrupted area of minimum 1200mm width in front of door		100
Are the door handles easily twistable to ensure painless opening. The lever type handles works better than knob type	T	40
The doors width should be greater than or equal to 900mm		100

Furniture	P/T/M	%
Are the legs of the furniture rounded		100
Is the seating height greater than or equal to 450mm		100

Control and operating mechanism	P/T/M	%

Are the light switches near the door and easily visible and accessible	T	89
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Bedroom		
Planning	P/T/M	%
Is there at least one bedroom on the lowest level of the house	P	78
Is the whole area at single level		100
Is the room shares same level as other connecting rooms	P	89

Furniture	P/T/M	%
Is the bed height greater than or equal to 450mm	T	56
Is the bed accessible from both the sides and is there minimum 900m wide passage on both the sides.	P	22
Are the legs of the bed and other furniture rounded	T	78

Control and operating mechanism	P/T/M	%
Are there two way switches for lighting fixtures provided	T	44
Are the light switches near the door and the bed, and are they easily visible and accessible	T	78

Door	P/T/M	%
Are the door handles easily twistable to ensure painless opening. The lever type handles works better than knob type	T	56
Is there uninterrupted area of minimum 900mm width in front of door		100
The doors width should be greater than or equal to 900mm	T	89

Bathrooms		
Planning	P/T/M	%
If the toilet and bathroom detached and has minimum size of 1200X1500, In case of attached toilet bathroom is the dry area and wet area maintained properly and has minimum size of 1200X2100	P	22
Is the flooring antiskid.	T	89

Does the basin have adequate uninterrupted space in front of it to occupy a chair and allow movements	P	78
In case of attached toilet bathroom is there space outside for dressing and changing.	P	56
Does the toilet and bathroom has tile drop or threshold between the range of 20 to 50mm	P	56
Is there hot water supply directly available in the bathroom	T	89

Fixtures	P/T/M	%
Is there at least one western water closet on ground floor at the same level as the bedroom reserved for elderly people	P	56
Are the faucets located on right hand side and are they easily operable	P	78
Is there a grab bar in toilet having height between 800 to 1200mm in case of western WC and lower in case of Indian WC at least on one side	M	11
Is there a backrest for Western WC	T	33
Is there a mirror in front of the sink which has the lowest height lesser than 900mm	M	33
Is there at least one grab bar in bathroom having height between 800 to 1200mm.	M	11
Are there hangers in the bathroom to hang dry cloths separately than the grab bars	M	78

Door	P/T/M	%
Is there uninterrupted area of minimum 900mm width in front of door	P	33
In case if the doors opens inside is there at least a 500mm space between the toilet seat and the door	P	67
Is the door width more than or equal to 900mm	P	67
Do the doors have a small itched glass panel for size not less than 150X100 from where the internal locks could be accessed in emergency situations	T	0
Are the handles and locks easy to operate and located between the height 800 to 1200mm	T	78

Control and operating mechanism	P/T/M	%
Are the light switches near the door and are they easily visible and accessible	T	63

Staircase		
Do the steps have non-slippery, uninterrupted railings on at least one side		100
Are all the steps in the flight of equal size	P	83
Is the nosing of the steps curved or finished		100
Is the trade more than or equal to 300 and raiser lesser than or equal to 150	P	33
Are the steps non-circular and have closed risers		100
Are the steps covered	P	83
Are the steps adequately lit	T	67
Are there less than 14 steps in each flight	P	50
Are there landings at the beginning ending and mid (In case of dog legged staircase)	P	50
Is the landing width more than or equal to the flight width	P	33
Is the staircase not circular	P	67
Is the staircase width more than 900mm	P	83

Table 1: Results

Conclusions:

Even though aging is not the consideration of people while building their houses many design aspects are considered and implemented in planning. From the interviews one can make out that aging population mostly find the toilets, steps as the most problematic areas. Still they are highly neglected while planning and designing. Hence special attention should be given by architects to these areas.

The temporary and minor aspects could be altered in existing buildings. But even though that is the case people usually don't tend to do these changes after construction, hence it is better to consider and implement all the aging friendly design parameters at designing and construction stage only.

So the most neglected permanent factors which must be considered while design stage are – toilets, staircase. Most neglected temporary aspects which are preferable to be considered are – floor finishes according to the use, the door type size and the side it opens, type of handles, fixtures used in toilet and bath areas, etc. The minor aspects which are essential to consider and implement which are majorly neglected are application of railings, grab bars, etc.

With time architectural style and implementation of new materials and fixtures takes place. A further study could be conducted on the changing housing type, materials and fixtures

implementation after 2020 and its possible negative effects on current young generation after 30 years when it would be considered as senior citizens.

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