

Architecture for the ageing population:

Effects of architectural design elements on the behaviour of elderly people

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Abstract

The built environment needs to adapt to the growing number of elderly people while maintaining and improving the accessibility of the built environment. Due to improvements in medical facilities, India is seeing an increase in this age group population. The design of the built environment needs to be reconsidered for adapting the needs of the elderly people and to improve accessibility for them. One aspect of the built environment that urgently needs to be investigated is the quality of assisted living facilities and age friendly communities. Environmental psychology can serve to create supportive surroundings for human beings who are challenged through physical, psychological, ailments, accidents, stress and tension associated with day-to-day lifestyles.

Keywords: *Age friendly community, Environmental psychology, spatial organization*

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1. Introduction

Architecture should respond to the growing elderly population. The means to do this is to design elder friendly communities. Elderly Friendly Communities “are places that actively involve, value, and support both active and fragile older adults, with infrastructure and services that effectively adapt to their changing needs. Elderly friendly communities are a housing alternative for seniors that offer flexible housing options, a coordinated system of services and facilities, and a continuum of care that varies residents' health and wellness needs.

An age-friendly community engages in a community building process that includes evaluation, planning, anticipating and preparing for the aging of its citizens, and implementation. This leads to guidelines and actions that maximize the chances of aging successfully.

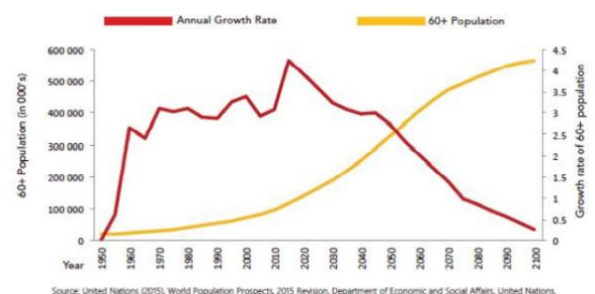
As long as possible, elderly residents of an elderly friendly community are:

1. Meeting their basic needs for food, shelter, health and safety.
2. Self-sufficient and independent.
3. Physically, mentally and spiritually healthy.
4. Live in a safe and comfortable communal house.
5. Active and committed to its community
6. Physically and emotionally accessible by all

1.1 Effects of ageing:

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The people who are 60 years or above are considered as elderly people, senior citizens or aged. Ageing is a very complicated process which is a part of our life process. Physiological and psychological changes occur with aging in all parts of our body. Some common diseases faced by the elderly are: Alzheimer's Disease, Mental Illnesses, Arthritis and Osteoarthritis, Blood Pressure, Heart problems and Heart attack, Stroke, Cancer, Diabetes, Kidney disease, Control Obesity, Prostate Enlargement, Osteoporosis (Weak bones), Tuberculosis, Eyes Diseases, Hearing Loss, Skin Care, Mosquito bite Diseases, Fall-related injury in old age, Emotional Disturbance, etc.



2. Reconsidering architecture for the elderly people:

Environmental psychology is defined as the science of the relationships between people and the places where they live and work. Both human environment as well as the surrounding needs to be considered together to know how the physical environment impacts the users. The relationship between people and place is very important since majority of our time is spent in the built environment.

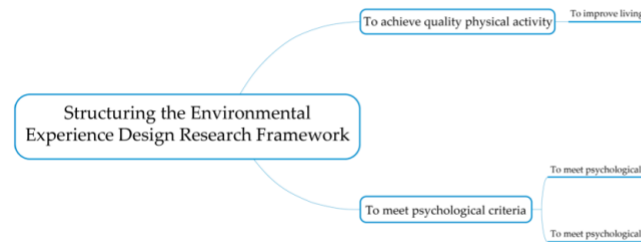
We live, grow, learn and work in the

built environment. We spend most of our time in the built environment. For example, when we are outdoors like parks or garden, although it is constructed of natural materials but are redesigned by human beings. The design of spaces affects the psychological behaviour of elderly people which in turn affects their attitude and behaviour.

Environmental psychology provides a relatively new approach to understand human behaviour within the world of architectural design.

3. Environmental psychology:

Environments built for elderly people must be carefully designed keeping in mind the needs and safety of the aged people because the environment plays a very crucial role in human attitude and behaviour. Environmental psychology can serve to create supportive surroundings for human beings who are challenged through physical, psychological, ailments, accidents, stress and tension associated with day-to-day lifestyles. This consciousness is especially essential in the center's that house the elderly due to the fact the constructed surroundings can significantly have an impact on the ageing procedure and the quality of life.



3.1 Design elements:

The concept of good health has evolved to encompass mental health and mental wellbeing.

S. Kristen Day, Daisy Carreon, and Cheryl Stump state that "Design is regarded as a therapeutic resource to promote the well-being and functionality among people with dementia".

Architects and planners must include ways of reducing stress and relaxation in the design of a built environment, especially when designing living spaces for older people.

Topics such as lighting, biophilic design, and colour theory require attention in carefully designing the indoor environment for the elderly.

Some elements which can be considered are:

1. Spatial Organization
2. Sensory experience
3. Natural environment and landscape
4. Interaction

3.1.1 SPATIAL ORGANIZATION:

Spatial organization encompasses many aspects, including how spaces are separated, how outdoor and indoor spaces are connected, and how social /

public spaces are arranged with one another. The spatial organization of an elderly care center with care for people with dementia can help to facilitate both privacy and social interactions. It can also aid independence and arouse curiosity. It is important that the rooms are organized from public to private, similar to a house to give a home like feeling rather than a dull and gloomy feeling.

- Spatial organization should allow residents to participate rather than discourage wandering.
- As people get older, they also find it harder to remember things, so it is ideal to keep circulation between rooms simple.
- Limit entrances and exits and keep the streets simple with minimal turning.
- Exits must be monitored to prevent residents from wandering outside the premises.
- Circulation layout such as L, H, square shaped result in better spatial orientation.
- Use of different colours, textures, materials can help in reducing confusion in indicating different rooms and help in finding spaces or direction.

Spatial organization varies according to the type of patients and their needs. For instance, if an aged person wants to be healthy by maintaining his/her physical activity, an architect can increase the distances between the spaces to allow people to walk more. However, if someone has walking problems, it tends to be very

hard for that person to move around, so planning a space with more distances between significant living regions can make occupants become disappointed and potentially even make them unfit easily. It is the architect's responsibility to offer users different ways so people can pick what sort of way they like to take. Regardless of the actual capacity of an inhabitant, studies have shown that being ready to explore and get to spaces inside their current circumstance has been connected to personal satisfaction.

3.1.2 SENSORY EXPERIENCE:

Another design element when considering elderly people is sensory experience. Sensory experience includes many elements like color, texture, light, materials, sound, etc. There is no one solution for creating a perfect sensory experience. It differs according to type of people, place, time, etc.

LIGHT - Light plays a very important role in achieving a better sensory experience in an elder friendly community. When talking about light, one should consider both natural as well as the artificial light as both significantly affect people and their wellbeing. When elderly people do not get exposure to enough light, they will in general have more health problems, and when those people have more exposure to natural light, health problems decrease. The effect of openness to light in decrease of health issues was altogether seen in mid to late phases of dementia. One method of providing more natural light for seniors is by providing adequate outside

spaces, like parks and gardens, that urge inhabitants to use them and spend much of their time outdoors.

COLOR – Color plays a very important role in achieving a better sensory experience in an elder friendly community. Color is very closely linked to light as light can have an impact on color. It has been recognized that color has both a physical as well as emotional impact on elderly people and these effects can be utilized as remedial elements. As we age, our impression of color shades changes as compared with when we were more youthful. Visual contrasts of color can make things look far or nearby; big or small; cool or warm, etc. The most ideal way of planning an elder friendly community would be to think about the colors as dark and light. By thinking about them through this relationship, architects can make a difference between components, for example, a light toilet and darker floors and walls. Through this, a contrast will be created and would assist an elderly person to easily sense the placement of toilet being in contrast with walls and floors. If they are not in contrast, it would be difficult to see and create irritation and frustration.



There should be use of warm color palette for elder friendly space but should be in such a way that it creates a contrast between different elements of room so that they can be seen easily by people with visual impairments.

MATERIALS – Material selection play an important role because elderly people are more affected based on sensory level. Impressions on elderly people based on hardness and softness, heaviness and lightness, are connected with the pattern or texture of materials. In interiors, cushions, drapes or bedsheets are some of the easy ways for adding texture to a room. All of these elements can be of various sizes, patterns or textures. These elements also provide a sense of residential feeling because all of these are very commonly used in homes. There should be more use of soft finishes rather than hard finishes. A very important point to be considered while material selection is glare.

3.1.3 NATURAL ENVIRONMENT AND LANDSCAPE:

Landscaping has many positive benefits for the elderly people. Architects should pay particular attention to the functional problems of each room as part of general planning to improve the health, fitness, learning ability, etc. of older people. The room which connects

the public areas and the hallway design must control each functional room. Physiological problems of the old, the corresponding width specification standards, handicapped accessible design, and stair design are suggested so that their effect is more convenient. Architectural space comprehensive design planning, such as easy and convenient transportation, internal and external public toilet design, design of the green environment indoors and outdoors, leisure and fitness, etc. and the landscaped botanical garden is created on the step, slope and window sill, roof, around the house are some of the elements which can be created to make the space fun-filled. On the other hand, the arrangement of the landscape plants is varied, the correct selection of some ornamental plants of vegetables and fruits favors the development of sustainable landscape management and is better suited to the mentality of being closer to nature in their life. Gardens have different therapeutic properties that are not normally associated with medicinal treatments but they have great advantages. Everyone interacts with these gardens differently, for example, some prefer to sit quietly while others find it more interactive. There is a vision of nature, be it actually through a medium such as a painting or an image, to be in nature and interact with nature. Gardening can be easily simplified or made difficult to suit people's physical abilities and personal needs. This is great for older people with dementia or other types of mental or physical disabilities, as their disabilities can vary widely from person

to person. Active participation in gardening improves an individual's physical and mental abilities. Gardening can create a sense of community and encourage social interaction and can help combat feelings of isolation and depression that older people often experience as they age. Rooms designed for elder-friendly communities must accommodate a wide range of users, with the needs of the most vulnerable patients first. The top most consideration should be safety and security. Species of plants also need careful consideration, as people with limited mental capacity may put inappropriate things in their mouths, such as plant leaves or flowers. Safety and maneuverability are two other features of a garden that are critical to its success. Most of the hard landscapes in a garden will be paths that allow access to the entire garden, such as sidewalks should be 1.2m and 2.1m for 2 wheelchairs passing at the same time. For the turning of wheelchairs in sidewalks in the garden, the minimum dimensions should be 1.8 x 1.8m so that a wheelchair can make a full turn. When it comes to choosing materials for sidewalks, concrete is an excellent choice because of its durability and low maintenance requirements. When it comes to using concrete, there are many aesthetic options, because concrete can be given different colors and textures. This not only makes it more appealing; it can also be a way of integrating orientation. Some other materials which can be used are wood and brick, but these two materials are more costly than concrete, less durable, and require more

maintenance than concrete. Some materials to avoid are tiles, asphalt and flagstone because they can be slippery and also are very hot.

Another key element in designing an elder-friendly community is the inclusion of a variety of seating options. As we get older, we get tired easily. Therefore, rest areas must be available and visible along a route. A good distance is 6 meters between resting places. There should also be several types of chairs and benches to accommodate groups of people, and there must be enough shading in spaces to avoid direct sunlight. In general, a garden is one of the ideal things to do in any elder-friendly community. There are many positive effects of including a natural outdoor environment in a built-up space as it often gives them simple pleasures.

3.1.4 INTERACTION:

Humans are social creatures to act, proceed and perform and we need interaction with other individuals and the surroundings that we live in. Thus, spaces that give us such opportunities are a need of time in cities. It is comprehensive idea for improving a neighbourhood, city or region. It strengthens the connection between people and the places they share. It is how we collectively shape our public domain to maximize values amongst users.

SPACE:

Space is something which constantly encompasses our being/ presence. Its visual structure, its measurements and scale, the nature of its light—these

characteristics rely upon our view of the spatial limits characterized by components of structure.

There are in basic three types of spaces:

I. Open space



II. Semi-open space



III. Enclosed space



In any space; ‘people make it a place’.

In all the different types of space, user feels differently psychologically and physically. Their perception and enclosure changes respectively in all respect. In open space user has more of visual interaction and less physical interaction but in semi open space visual interaction decreases and physical interaction increases whereas in enclosed space visual interaction gets restricted to that space only but physical interaction with that space increases gradually.

Interaction can be classified as follow:

I. Types of interactions:

- Interaction with users
- Interaction with space

II. Modes of interaction:

- Visual interaction
- Physical Interaction

INTERACTION WITH USERS:

SOCIAL INTERACTION

• Social interaction is the interaction amongst people/ human beings.

• Human beings are social creatures; they cannot live without having interaction with others.

• A social interaction is an exchange between two or more individuals and is a building block of society.

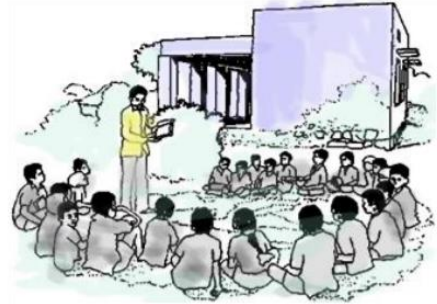
• Social interaction calls for a mutual orientation. The spying of one on some other is not social interaction if the person is unaware.

Forms of social interaction:

- Between individual and

individual

- Between individual and groups
- Between groups and groups
- Between individual and culture



Types of social interaction:

- I. Formal interaction
- II. Informal interaction

A formal interaction is interaction of people formally. For example, when they are involved in any interaction for

meeting, when they interact while working hours, interacting with officials, clients, etc. There is a bondage in formal interaction as for doing any activity they are restricted to do in a proper manner and in specified area.



An informal interaction is interaction of human beings casually. For example, when they are involved in any interaction with friends or family members in very casual way. Interaction is not while working. There is no bondage of behaviour in person. They can sit, stand, walk and talk anywhere and anyway that they find suitable.



FACTORS THAT DEFINE CONTEXT OF SOCIAL INTERACTION:

1. The physical setting / place
2. The social environment
3. The activities surrounding the place



For an example let's take an open-air theatre, OAT itself is the physical setting or the place, public coming or gathering in that place to watch performances is the social environment and performance is the activity surrounding the place.

INTERACTION WITH THE SPACE

Interaction with surrounding or environment refers to the interaction of the user with the physical environment of the area such as- placement, landscaping, building envelope, climate, streets, pedestrian linkages, sound & light etc. Interaction of user with the surrounding is very important to make the user feel comfortable, safe and relaxed; The above factors attract people to gather at that place and also to stay for longer span of time.

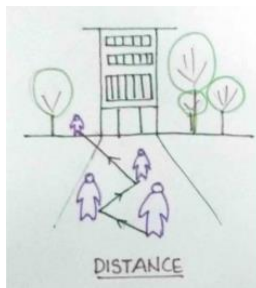
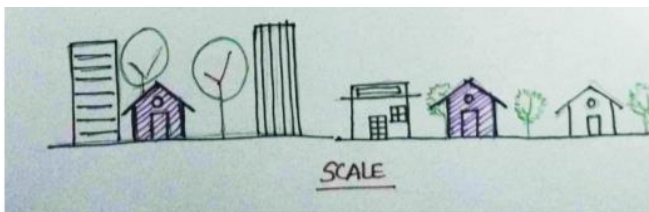
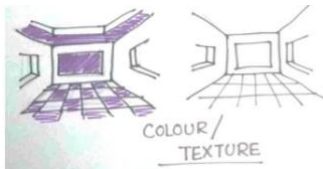
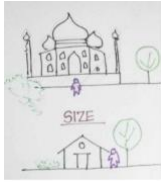


If the physical environment is not proper, the user feels discomfort & it no longer remains soothing for them to occupy that space.

Factors how we perceive space:

- Scale
- Distance

- Colour
- Size
- Organization



4. Conclusion:

- This paper is an overview of environmental psychology views and its functions in developing an elder friendly community.
- The studies evaluate the growing senior population and related challenges seniors face as they age, and the factors of the built environment that affect elders and their well-being.
- The built and natural environments have the capacity to

persuade the elderly, with effective or bad outcomes. The preference of site and the way the building is incorporated into the community is critical.

- The development should be incorporated into the community's fabric and allow for as many natural and convenient community interactions as feasible.

- The development should provide and promote possibilities for the elderly to participate actively and interact with the building and its amenities.

- The aesthetic of the building should be casual and inviting, adhering to the essential laws and regulations to ensure safety and seamless living.

- Private and public spaces should be flexible enough to meet changes in resident needs, population changes, and technological advancements in formal structures relating to aged care.

- The aesthetics of the buildings and the services they provide should help to change public perceptions of the elderly and care facilities, as well as stimulate connection between residents and the community.

- In terms of movement and wayfinding, the environment should provide a high level of transparency.

- The building and the natural environment should be in sync, and residents should be able to enjoy a positive relationship with natural components including fresh air, plants, water, light, and open-air spaces.

- A colour palette should be subtle between warm colours and cold colours to be used.

- In addition to official spaces for social interaction, the development should provide comingling spaces that encourage casual conversation among residents.
- Finally, the design should take into account the existing sense of place that is associated with the chosen location and surroundings.

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