# STUDY ON ENVIRONMENTAL FACTORS IN ELDERLY HOUSE

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## ABSTRACT

In recent years, fast increase in number of the elderly entails numerous consequences. Majority of the elderly are counterproductive people economically, isolated socially and subjected to the risk of chronic diseases, disability and disability caused by it in terms of health. As a result finding a solution and factors which are effective in increase of satisfaction and quality of life among the elderly and designing a favorable enviornment for the elderly are of great importance. In this regards, with study and analysis on enviornmental factors contributed in elderly's life satisfaction, it was specified that however enviornmental factors are consistent with their signifying aspects such as sense of place and sense of space at physical environment, no favorable quality at the elderly house has achieved; one of the major reasons is architects' lack of deep understanding of the elder's human needs and lack of recognizing his needs, thus it seems that firstly the elderly's mental, emotional and personality characteristics and their physical limitations have to be recognized so as to meet their needs and then suitable living environment including qualitative environmental issues(place and space) which their major characteristics have undergone negligence have to be made for them by considering the factors mentioned above. In the present research, factors affecting increase in environmental quality of elderly's houses using questionnaire, interview, field observation have been recognized and classified and the required environmental factors in design of suitable house for their living have been recognized. The exploratory factor analysis has been the research method used in this article. The results from research indicate that residents' satisfaction with elderly's house environment (place and space) among the environmental factors has the highest effect in increase of elderly's life satisfaction and quality.

Key words: Design for the elderly, quality of life, elderly's environment, place and space of elderly's house

## INTRODUCTION

With change in social conditions and collapse at family-based system at traditional communities which have been always the advocate of the family's elder members and with study on various figures and information on this point that a large number of elderly in the today's modern life face neglect by children and their relatives and some need care due to bachelorhood at old age under the conditions that elderly live alone at old age, it requires expanding and improving the spaces for elderly and creating the places for the elderly's comfort. Design of spaces consistent with elders' specific conditions can be effective in enhancing the abilities of this class. Since a person's behavior inside a space has associated directly to the body designed for that space and our living environment has not been designed and equipped in a way to consider the restricted abilities of the elderly, an attempt to design the spaces is made to provide the favorable performance of the elderly.  With study and analysis on the environmental factors, it was specified that however enviornmental factors are consistent with their signifying aspects such as sense of place and sense of space at physical

environment, no favorable quality at the elderly house has achieved; one of the major reasons is architects' lack of deep understanding of the elder's human needs and lack of recognizing his needs, thus it seems that considering spatial and environmental characteristics of the elderly house and explaining an in-depth outsight to the ability in the space or designing the architectural space are required so as to meet the elderly's needs. In this research, the factors affecting increase in environmental quality of the elderly residents and elderly houses using questionnaire, interview and field observations have been recognized and classified and the factors required in designing a suitable house for their living have been recognized. The exploratory factor analysis has been the research method used in this article. The results from research indicate that Walk Ability among five factors associated to residents' satisfaction with environment (Educability, aggreability, ease of access, Walk Ability, similarity of nursing homes to house) has the highest effect in increase of elderly's life satisfaction and quality.

***Elderly from point of view of scholars***
Aging is a personal and social experience. It would be happiness for some and sad and dreary for others, but it should be noted that each of these feelings are formed as rooted by culture and society in which one lives.[1] Aging refers to one of the crucial stages of human development that is not just raised as the end of life contrary to popular belief, but it is raised as a natural process in life. Thus, nowadays, in most of developed and developing countries, the Mechanisms that cause the elderly to join the community have been granted support by non-governmental social organizations and governmental organizations. Given the importance of old age, various theories and insights from diverse thinkers and scholars in various fields have been stated (table 1). It seems that the successful aging idea is a suitable solution to reduce problems at elderly. Indeed, successful aging refers to acquisition of potential personal ability and optimal level of social and physical ability as well as mental health, through which the elderly enjoy themselves and other, or in other words successful aging refers to an integration of long life, health and happiness which extend the peace of mind till the end of development.[2] Most of the successful aging criteria such as improvement in quality of understanding from life and objective environment are in direct relationship with public urban spaces and Environmental ideas at these spaces.

**Table 1**
***Ideas and viewpoints of various scholars on
conditions at elderly(source: authors)***

| Concept | Outlook |
|---|---|
| This outlook says that the community and the elderly in association to each other restrict most of their bilateral relationships. With regard to this theory, Inevitability of death obliges the person to abandon an important part of their social roles. At that time, community abandon elderly and implement this by the procedures such as isolating them in their residence, education, entertainment and so on.[3] | Lack of commitment and The function-oriented outlook(Cumming and Henry 1961) |
| With regard to this theory, some roles of the elderly have been denied and their remaining roles have not been defined clearly. With regard to theory of activity, successful aging requires discovering new roles or creating new means to maintain the old roles.[4] | Activities and Mutual Social action |
| This outlook seeks to give response to this question that why the elderly have poorer mutual social interaction? Theory of exchange argues that the mutual social action and relationship are raised among people in a complete way when all the participants not just feel taking benefit from the relationship between them but also feel taking benefit from love, interest, respect and other non-material awards.[3] | Exchange(James, D. 1980) |
| This outlook has been developed based on the man's evolutionary theory, aimed to examine problems at families in relationship with old parents and help to them and sometimes other old people. With regard to this theory, children's care from old parents might lead to physical, emotional and | Evolutionary family (Evelyn Duvall 1977) |

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financial problems for the people at old ages. Further, coincident with increase in number of the elderly, their dependence on other people is also raised.[5]

This outlook has focused on cognitive action, control understanding and satisfaction with elderly's life. The concept of successful aging has often understood with life satisfaction and has been often known same as the survival with health. A more comprehensive definition on successful aging has integrated all these three elements: survival, health and life satisfaction. Indeed, behavioral ability (health, understanding, motor behavior and cognition), psychological well-being(happiness, optimism, alignment between goals and willingness), quality of understanding from life(assessment of life, friends, activities, job, income and house), and objective environment(house relationship, neighbors, income, activities and etc) are the good criteria of elderly. Further, successful aging is called the ability which includes three behaviors or three characteristics: 1-less probability for disease which leads to disability, high mental and physical action, active involvement with life. They put emphasis on this point that their definitions differ from disease, disability and avoidance from aging.[6]

Successful aging(Byltz and Byltz 1990)

## Result

Successful aging seems to be a suitable way to reduce problems at elderly and a proper response to the problems mentioned at three first outlooks. Indeed, the outlooks above implicitly put emphasis on the necessity of the elderly's active involvement with life, acceptance of social roles by them, necessity of making optimal social interaction with the elderly's interests with community members. Paving the way for elderly's citizenship partnership at public urban spaces seems to be a proper response to all above concerns and assists to achieve the goals of successful aging.

with regard to the concept of elderly house and the principles mentioned in it as well as table 1, it seems that attempt to maintain elderly's vitality by providing favorable space for elderly can be one of the factors for access to the top goals of successful aging, because successful aging is not mimic from youth but it is the elderly's active involvement with people, groups, activities and life.[6] A large body of studies has been conducted on attention to elderly's behavorial patterns and needs in design of environment and house. Some of these studies by explaining the elderly's mental and physical characteristics at aging have put emphasis on design of suitable private spaces for elderly such as elderly houses using design techniques and standards.[7] Some other by considering the elderly's physical and mental characteristics at aging have presented suitable environmental characteristics for the elderly in a way to be used in both public and private spaces.[7,16] In this regards, Behrouzfar(1998) regarding special conditions and limitations at elderly know the favorable environmental characteristics for the elderly included of sensory stimulation, availability, understandability, meaning, compliance, giving individuality, privacy, socialization, aesthetics and comfort.[7,16]

### The definition of elderly

Elderly is the one who has literally surpassed many years, years filled with memories and experience acquired over time. Aging phenomenon is a natural process in which physiological, psychosocial, mental and social changes occur in the body. yet, it is less likely occurring physiological aging, mental aging and social aging in a person concurrently, because the person might be considered elderly biologically and physically, but he feels himself young psychologically and/or vice versa the community might oblige the person who is not elder biologically and mentally playing the social role. it certainty cannot be said that old age begins at what age because it depends on physical, mental, emotional, social, political and economic factors and conditions and the events which occur at collective and personal life and differs at various communities.

### Nursing house

These centers under the (nursing home) have been established in populated centers by government, charities, municipalities and individual donors at different levels. These centers have been established more to take care of the sick, disabled, lonely and often poor elderly. Unfortunately these centers have not had a special planning to create a favorable and suitable environment for elderly and their mental needs and their unfavorable situation in terms of health and other services has caused elder abuse and neglect, and a permanent stay of children and family has induced them to depression and anxiety at this period and caused their physical and mental diseases; escrowing elderly to family has been known as the best way, so that moral preaching to families to take care of the elderly is sufficed among the scholars and authors. While, the families fail to meet all needs of the elderly.

### Various theories on nursing house

Residence does not mean absolute stillness and in nature stillness and movement are mixed together in a balanced condition. In this way, nursing house should be moving always.[8] The relationship of man with what he has made to other topics is a little more complicated, because since coming the idea of making an object to the man's mind to prepare plans and programs, collect raw materials, know how to build and how to exploit it, making relationship between that object and other man-made objects and nature and controlling their negative and positive outcomes and informing the divine standards and complying them are required.[9] To date, a variety of theories have been mentioned on how the elderly house is and how they socialize and make relationship with other social classes. According to a theory, the elderly should live with other family members from different age groups and generations, and according to another theory, the elderly should live separately, but none of these extreme theories are true. With regard to the third theory, if the elderly live in a separate residence and be in connection with different age groups, this would be better. According to the prevailing theory in this context, the elderly have been extremely upset of being transferred to the institutions and psychologically are in a state of turmoil. This is despite the fact that more than half of the elderly residents of these institutions can continue to live independently. Further, another group believes that it should arrange for the elderly to live in a group in private buildings at residential neighborhoods and

live together. It is obvious that it should present a variety of solutions at different elderly stages, but it can arrange that the elderly house provides various theories.[10]

### Analysis of the studies on increase of elderly's life quality

Making a suitable environment should link thinking and action at technological areas of building and environment, medicine, and psychiatry and a deep interest in assisting the parties to the aging at a good environment. The real goal can be finding and presenting simple and small solutions to solve the potential problems. As a result, study and analysis on the related works can help the architects in reaching to an internal link between the elderly's behavior and his needed environment. In a qualitative study by Katheryn Leith (2006), the house for the women elderly who were living in social residential complexes in a city in south of US meant:

- An autonomous decision to find places
- The decision to feel in place
- Trying to stay in any place

In this study, it has been concluded that a successful displacement to continue less life has depended on external and objective factors and more social or innate and intrinsic factors are involved in it.[30] Another article by Jonas Anderson has focused on architecture competition for the silver generation, namely those aged 65 years and older. 27 persons were interviewed in this research in which an interview guide has been used. In this research, the interviewees mentioned the architectural aesthetic factors for long life in one place and independent living in residences.[31] Findings of this research indicated that suitable space for elderly is obtained easily in access to space around or distribution, social fabric and nature which are all based on personal preference.[31] In another article, Sook-Yin Lee (2012) has known the overall design associated to three issues of social, mental and physical health and has known designed associated to three issues of architecture design factors, internal space design factors and design components.[32] Further, in Life Expectancy Survey (LES) , effective sub-factors in increase of quality of life have been classified which include family background, marital status, economic status, body composition, exercise, alcohol consumption, smoking, mood, education, environment, sleep, temperature and care of elderly among which it can know exercise, education, environment, slepp,

temperature and care of elderly associated to architecture.[33] In another questionnaire which relates to the elderly's life expectancy, the sub-factors have been classified as follow: The life, health, social relationships, homes and neighborhoods, independence and control over life, liberty and physical and emotional comfort.[34] In another study by Yuko Matsuoka which examines the elderly houses in Japan and Denmark, it can classify the elderly houses in Japan to two organizational and non-organizational types.[35] In this article, sense of security and safety of stay in nursing house till the end of life is the most effective factor in welfare and comfort of the

elderly. In another study in 38 nursing houses in Sheffield, Yorkshire, Chris Parker says that attention to security and health of elderly causes creation of the environments without risk which is contrary to quality of life especially for the residents with the least disability. In Sheffield matrix, four global, cognitive, physical and staffs factors in relationship with architecture factors have been compared. With regard to these studies, quality of life is a multidimensional structure which includes various states such as physical health, psychological mode, independence and social relationships.[18]

**Table 2**
*literature Review researches in the context of factors affecting increase of quality of life in elderly (Zarghami & Olfat, 2014)*

| Environmental factors affecting increase of quality of life in elderly | |
|---|---|
| Recognized factors | Researcher |
| Social and instinctive factors | Catherine Leith(2015) |
| Health (biological, psychological and social): architectural design, interior space design, design factors | Sook-Yin Lee(2012) |
| Sports, education, environment, sleep, temperature, care | LES (1984) |
| Life, health, social relationships, homes and neighborhoods, independence and control over life, liberty,Mental and emotional comfort | (OPQOL-35 (2012) |
| Continuing education during aging, dissimilarity to the hospital, like being home, naturalistic living space | Leterme and Testori ) (2012) |
| psychological Comfort, behavioral competencies, objective environment, perceived quality of life | Loughton(1983) |
| Qualification and access, safety, comfort, dynamism and charm, Alignment with the nature, symbolism and ambiguity, identity, freedom, contingency, ecologism, unity, discipline, mental memory | Poor jafar, Taghvaei, Bemanian, Sadeghi, Ahmadi(2010) |
| Accessiblty, sensory stimulation, cognitive ability, sense, conformity, individuality, privacy, socialization, aesthetics | Behrouz far(1998) |
| **Sum** | |
| Body, soul and body, the environment, space | |

***Recognition of the characteristics of the elderly regarding the* Maslow's *Hierarchy of Needs***
Human being is a complicated creature which has moral and material motivation in every age. Motivation is a force which conducts the behavior, i.e. behaviors form to meet human needs (1. Thus, recognition of human needs especially at the elderly is of great importance in design based on making a suitable relationship with life and surrounding

environment and such patterns which have psychological background and associated to the qualitative discussions on space. The needs mentioned by Abraham Maslow develop the hierarchy which are put in 6 hierarchies from the transcendent needs to basic needs which these factors are the needs to live for a healthy person. The proposed Maslow's Hierarchy is as follow:
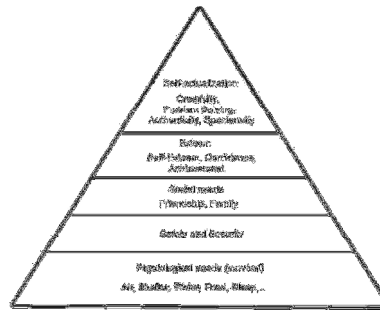
**Figure 1**
***The pyramid for man's needs based on* Maslow's *Hierarchy (19)***

It is obvious that the study on elderly's needs is a preclude to determine their required services and detect their preferences and requirements. This, as a part of the suitable design and planning process, can give response to this question that which elderly's need should be taken into attention by the architecture first. Thus, recognition of the status and study on needs should be known the first stage of a process which includes planning services and implementing and assessing them. Table 2 represents human needs to space quality, i.e. if the made space has the qualities above, it can make long relationship with users[11], including sense of belonging to place(identity, sense of place and space, social facilities and so on) which is a non-material need by which it can make space longevity.

**Table 3**
***A variety of elderly's needs to design quality (source: authors)***

| Elderly's needs | | The related design quality |
|---|---|---|
| Physical and sensory problems | Physiological needs | adequate Facilities and equipment, comfort (temperature, sun, rain, micro-climate regulation), Strength ecological- based balance |
| | Safety needs | Road safety, surveillance, privacy, permeability and flexibility |
| ental problems | The need to belong | Identity, sense of place, community facilities, readability, visual fit |
| | Need to appreciate and respect | Sense of belonging to space, individuality and belonging to group |
| Social problems | The need for self-actualization | Opportunities for space personalization and participation in design, diversity |
| | The need for aesthetic | Facade and perspective |

In this section, with regard to what said above, the elderly's characteristics are examined and these characteristics are divided into two groups.

***Mental characteristics***
Elder compatibility with the environment comes to realize difficultly for reasons, i.e. they face psychological and emotional problems including loneliness, the desire to attract the attention of others and a sense of ownership, thus they might control the environment to reduce these mental pressures and oblige others to obey them. The internal upheaval made in the elderly include changes in emotional states, thoughts and is self-concept.[7] Some of the common sentiments of the elderly include:

1. feel sad because of the lack of attention of children and family.
2. Loneliness because of the rejection.

3. Hopelessness, especially in elderly who have financial problems.
4. Feelings of anxiety and concern.
5. The sense of waste and futility.
6. Feel a burden.

### Physical characteristics of the elderly

According to the results, 50 percent of reduction in physiological activities in people 30 to 70 years is due to environmental factors. Therefore, the design of the living environment of the elderly should be appropriate to their physical conditions and health so as not to feel need to others. Further special changes and features in the elderly change from person to person dramatically.[13] Thus, some of the required features in design of suitable space for the elderly's life have been mentioned below:

### Physical-motor limitations

The older people become, their mobility are also reduced. The problems related to mobility can be followed by uncertainty to move between space and fear of falling in relation to rest of features which affect design such as limp, tend to look down while walking with a cane, need to break in the path of moving from a space to another space, inability to flex the foot and the need to stretch it. The physical changes which have led to specific needs and affected details on design include:

A. Shortened stature than normal size and shortened the horizon of view
B. The weakening of the forces of movement and quick movements.
C. The slow speed of the reaction.
D. An increased sensitivity to high or low temperatures
E. The weakening power of sight, sound and smell
F. Loss of control over bladder and bowel function.

### Understanding of the environment (Place and space)

In real life, our behaviors also occur within the environment, although the environment is constantly changing, it is rich in information, that is, despite what is seen, the more its meaning is included.[20] People interact with environment directly through their artifacts which also include buildings, the physical environment is formed in such a way that befits the current pattern or desired behavior.[11] Further, it is of great importance since it provides respect and beauty through the symbolic messages. In a definition, environment refers to a recognition of the human habitat to meet the needs and actualize his existence which conduct the awareness from the environmental capabilities and how the man interacts with those capabilities the tge architectural design and creation of space and place. Since the elements of architectural space define its entirety, the elements and components should enhance this capability in order to raise the visibility of the environment. Further, use of concept of capabilities can lead the designer to consider the possible user's activities during design which are of great importance increasingly in most of design factors. Role of capabilities in major design process is to consider the possible activities and let the user to present a solution for environment.[21] Thus, definitions on deep study on concept of environment and its Overt and covert aspects and implications can pave the way for efficient design of environment. In architecture and design, the space has not a dynamic structure itself, but motivational review is required so as to understand how change occurs at this space. On the other hand, the mentioned capabilities imply the relationship between the perceivers, that is, a features of environment might raise special facilities and capabilities for a person regarding the structural features with specified performance, but might not raise for another person.[22] For instance, fence or railing separating spaces can also raise the ability for users to sit, which this understanding might be due to users' various impressions which are based on various emotional features.[23] But the interesting point is that capabilities of a physical environment either good or bad are what which suggest that environment with all its features. According to Gibson,[24,25] environment capabilities refer to what the environment has presented to the organism and suggested to it.[26] A built environment that is appropriate and adapted to the needs of people includes the competences which provide human behavior. Thus, a behavioral place includes various potential competencies and is almost unlimited, so that use of these capabilities depends on:

1. needs of users.
2. Their ability (physically, mentally, spiritually).
3. Their experience of usability.
4. How to build and make the used environment[26]

In addition, capability implies what is made on an object. For instance, a chair has the ability to sit on it, a button has the ability to press it and a knob is capable of turning or pulling depending on how it is designed. Capabilities are effective to the same

extent which is intuitive. The capability neither has object properties nor mental properties, but it has both, as result capabilities remove the object-mental duality; in other words, capabilities include the environmental and behavioral realities which are both physical and mental. Capabilities refer to both environment and space as well as the viewer.[24,25] Concept of environmental fitness has been defined as the degree which matches the people's needs with environmental capabilities facet in dealing with their needs. With regard to what mentioned, various users of an architecture work at various times will enable to search various function of that work based on their needs. In this regards, architecture form and spaces provide various opportunities for the man behaviors so that the built space suggests various functional layers to the man based on his needs.[26] Table 1 examines various impressions from the concept of environment at space and place and its implications associated to the man-made environment from various point of view.

**Table 4**

*Definitions on environmental capabilities (space and place) at architecture (source: authors)*

| Axis of theory | Theory | Theorist | environment capabilities (space and place) |
|---|---|---|---|
| Form | | Kurt Kafka (1935) | (Invitational) or(Demand) |
| Function | Physical environment | Levine (1936) | With the German translation of (valance) Aufforder ungscharakter |
| Theory | Physical environment | Alexander (1964) | Fit: Scaling human needs with environmental capabilities |
| | | Barker (1968) | (Synomorphy) |
| Theory | Physical environment | Michelson (1967) | (Congruence) |
| Perception | Physical environment | James Jay. Gibson (1979) | part of the thing that makes it usable for living things |
| | | Shaw and colleagues (1982) | (Effectivity) |
| Theory | Physical environment | Kaplan (1983) | (Compatibility) |
| | | Louis Kahn | (Availibilities) |
| | | aldo van eyck | (Multivalence) |
| Function | Physical environment | .James J Grinkov | Ability: it depends on anything which takes place at enviornment and type of interaction |
| | | (1992) Snow | (Aptitude) |
| | | Bell and C. Greene and Thomas | Capabilities refer to the facilities which are provided by enviornment and strong behavior factors |
| | | Braun | (Capabilities) |
| Function | Physical environment | Mc Andrew | Performance of land: access to profitable performance of objects |

With regard to the related works on concept of environment and table above, space and place refer to the comprehensive concept which to which various implications has been given due to various implications in line with the living environment. The architecture area and living environment have been inspired of these implications, but emphasis on concept of the ability of space and place has less likely referred to the applied and efficient concept, thus it seems that it can achieve an efficient conclusion by deep analysis on this basic concept in

the context of architecture and living environment studies.

### Manifestation of environment (space and place) in nursing house

From perspective of environmental psychology, place and space have been connected to each other through the capabilities which have environmental properties;[28] on the other hand, function of object and environment provides the required capability to do an activity. To improve architectural design and present a form appropriate to the function, recognition of environment capabilities including geographical, cultural and social properties is required. Thus, potential capabilities at various levels have been embedded in architecture environment and use of these capabilities depends on people's mental and physical characteristics and users of those capabilities.[26] Lang believes in capabilities as the special patterns of the built environment which is obtained from its design, the materials used in it and how it has been assigned to a special group of people. In this regards, capabilities are defined at two levels of recognized meanings or the direct capabilities and symbolic meanings or indirect capabilities. The efficient category in this context is as follow:

1- the capabilities which the people need to interact physically with the environment. This physical interaction provides people's major needs such as walking, eating, sleeping or so on.[26] In other words, spatial environment should be consistent with the major biological structure of man.[29]
2- the capabilities which people need them for their social communications and inter-personal relationship. At this level, architectural space capabilities are an interface for encryption and decryption.
3- the capabilities expected by people to meet symbolic interactions and demands together with cultural and spiritual properties from environment.[26]

A deeper level of communication exists which specifying and measuring it are tougher, i.e. symbolic or expressive significance of a place;[29] physical environment does not present these meanings and capabilities at this level to other creatures except man.[26] Environmental and spatial relationships at a building are disorganized and influenced of users' relationships and interactions, thus spatial studies on activity places are based on functional assumptions and social logic of space.

Indeed, the environment has structure, reflecting and facilitating the relationships and interactions between people and physical elements around them. The elderly house has a social and collective logic, and it can be predicted through analysis on spatial structure and users' activity, how to organize space by architects for better living goals for the elderly, and it can reveal effect of spatial organizations on people's interactions.

### The interaction between elderly and elderly house space

### Effects of elderly's behavior on space

Since space refers to a phenomenon which should be considered with people and their behaviors, people's behavior at space affects qualitative properties of space. Quality refers to a term which finds meaning in relationship with man.[14] Thus, it can say that the elderly house takes a part of its properties which includes qualitative properties from the effects of elderly's behavior at that space.

### Effects of space on elderly's behavior

Without doubt, space as an objective part of environment can affect behavior. However, effects of space on behavior are not definite, the space can put undeniable effects on behavior.[14] The behaviors based on the response received from environment can be weakened or enhanced, i.e. quality and quantity of elderly house can determine the behavioral pattern for the elderly. Thus, the elderly hosue is a part of the behavior context, and it can have a role in control of behavior or removal of elderly's behavior. Therefore, it can consider an inductive role for elderly house. Since the environment includes a series of behavioral bases which are inside each other and have interfaces. The major elements of these behavioral bases are major model of physical behavior and environment.[11] Since behavior of a person inside a space depends directly to the designed body of that space and our living environment has not been designed and equipped in a way to consider the limited capabilities of elderly, an attempt should be made to design the spaces to provide favorable function of the elderly. Thus, the basis mentioned in these studies is that how the behavioral patterns and events of space and environment associate to the spatial structure of the elderly and how this spatial structure affects these events; indeed, design of place requires attention to three major facets, that these three major facets(perception components, collective-spatial components and physical-spatial components) develop the components signifying

the interaction between three major areas of environment (man, natural environment and physical environment).

### Factors affecting creation of favorable environment and space for the elderly

The link between behavior and environment can be examined in different ways; two factors of environmental pressure and capability can be used in modeling for study. It is supposed that the favorable behavior results from the relationship between capability and environment pressure which makes an internal association between the person and his environment. In process of environment design for the elderly, it should take this point into account that the capabilities are under influence of a large body of mental and social components. Such components which can be touched less are in bond with environmental properties which should be considered to provide natural aging of people in the environment. With regard to the factors mentioned above, behavior of the elderly inside a space depends directly on the designed body of that space. Since behavior and environment find meaning with each other, the elderly's surrounding environment should had been designed in a way to provide favorable function of the elderly.[15] In this regards, in addition to significance, the spaces should meet the mental and physical needs of individuals, and these are mentioned in table 2.

**Table 5**
***Factors affecting formation of favorable spatial items (source: authors)***

| factors affecting formation of favorable spatial items | Explanations | Needs |
|---|---|---|
| Environmental factors, physical comfort, social and psychological convenience | Precondition of a successful public space | Convenience |
| Use of natural spaces and elements which have hidden the space and avoided visual access | Precondition of Comfort | Comfort |
| Creation of public spaces to the major activity streams for people's visit; creation of suitable views and use of large spaces with creating opportunity for activity | It can lead to sense of comfort | Inactive involvement with environment |
| Creation of an opportunity for social contact; abnormal elements and/or special events can lead to creation of triangle phenomenon: a process in which the relationship between people and strangers is made by external stimuli such as putting interesting elements at space which cause the individuals who do not know each other talk to each other. | More direct experience of space | active involvement with space |
| Creating sense of curiosity at the spaces which are at the threshold of other spaces | It depends on difference and change in space | Discovery |

Spatial studies on activity places are based on the functional assumptions and social logic of space. Spatial organization can strengthen the favorable social interactions and can have a direct effect on creation of favorable silence; indeed, it can achieve a suitable level of collective relationship and favorable silence well suited to the activities at considered spaces through suitable organization of spaces and spatial arrangement.[11]

### Study and analysis on samples

The works below contain valuable innovations in the context of design which environment and space features can be witnessed in them. The index to select these features is in this way that the selected samples have been all the favorable works and enjoyed reputation between people and architecture specialists due to architectural points. With study on existing properties which have formed of the environmental and spatial structures, it can achieve a favorable outcome on how the space is built in nursing house.

**Table 6**
*Sample for elderly nursing spaces (source: authors)*

| Row | Project features | | Enviornmental factors | Image |
|---|---|---|---|---|
| 1 | Architect | Architecture group MVRDV | Sizes, colors and materials terraces, size of opening, random and irregular placement of all the elements indicate diversity at all elements of this façade. This diversity is the most important factor to reduce Homesickness in residents and increase personal character of each unit. |  |
| | Project | Uzoko nursing house | | |
| | Place | Netherland | | |
| | Year | 1997 | | |
| 2 | Architect | Toshio Akimoto | The simplicity and purity of size, hierarchy of access and respect for private spaces at units indicate architect's attention to common traditions at Japanese architecture; All communication spaces between the units is the place for social encounters and resting place for the elderly. |  |
| | Project | Yakult nursing house | | |
| | Place | Japan | | |
| | Year | 1998 | | |
| 3 | Architect | Kcap Architecture Department | Ease of access and readability and simplicity of communication are the effective ideas in design of this complex. |  |
| | Project | Emerald nursing home | | |
| | Place | Netherlands | | |
| | Year | 2000 | | |
| 4 | Architect | SWA Architects | It is smart relationship between architectural elements and elderly which has raised an inevitable |  |
| | Project | Sun City nursing home | | |

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| | | | | |
|---|---|---|---|---|
| | Place | Japan | intimacy to the person at this complex. |  |
| | Year | 2001 | | |

| | | | | |
|---|---|---|---|---|
| 5 | Architect Project Place | Matthew Ayres Alkasr Resorts Portugal | The basis is study of a special type of community; a type of micro-community with special rules. |  |
| | Year | 2010 | | |

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|---|---|---|---|---|
| 6 | Architect Project Place | Lopes da Costa Residential nursing building Portugal | The shape of the land (triangular in the construction area) and the sharp drop of the same have heavily conditioned the proposal |  |
| | Year | 2013 | | |

| | | | | |
|---|---|---|---|---|
| 7 | Architect Project Place | Nomade Architecture group Nursing home France | The facility is constructed from a combined concrete and timber structure. The use of wood as a facing material gives the entire constructed envelope a sense of unity. The vertical cladding applied to the façades uses local species (acacia and chestnut) that are provided with two colour tones (grey and natural wood) that will harmonise perfectly over time. |  |
| | Year | 2013 | | |

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# CONCLUSION

With regard to what mentioned, various users of an architecture work at various times will enable to search various function of that work based on their needs. In this regards, architecture form and spaces provide various opportunities for the man behaviors so that the built space suggests various functional layers to the man based on his needs. As studied in this article, a variety of views have been given on the concept of environment(space and place) and use of it in design of nursing house based on environment-based concept. These views imply objective, theoretical, conceptual and functional aspects of design at environment on one hand and imply indirect aspects of environment which are grounded on personal, social and cultural features on the other hand. With regard to the mentioned discussions and considering Iran among the countries with population structure of adults and increasing trend in number of elderly in developed countries and Iran who live in their personal house, compliance with the mentioned requirements for the elderly is of great importance in architecture designs and especially comfort space in nursing house which the designers and architects should consider it in their designs so as to raise a suitable and pleasant environment for the elderly, because these people will be the members in this social class. Thus, to sum up, it seems that the elderly house is a concept dependent on place and space which enjoys various levels in attention to architecture spaces. Process of design of nursing house based on capability of space and place or process of environment-based design is such process grounded on precise study on design context. Thus it requires paying attention to implicit and explicit capabilities in physical environment of the elderly in design on one hand and paying attention to prediction of capabilities of the designed environment based on elderly's need on the other hand, i.e. the expected capabilities of design are detected by compliance with explicit and implicit aspects of design context which includes features of natural and physical environment for elderly.

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