

# House design for dementia patients

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**Abstract:** Dementia is related to weakened cognitive abilities, memory, and behaviour. The increasing number of patients is a threat to the future. Therefore, the built environment and services for dementia patients must be adapted. This study generates a survey to understand how to have a better interior environment and adapted place for dementia patients. It was found that people who are diagnosed with dementia seeks familiarity (%55), good amount of natural light (% 15). They prefer more spacious rooms and kitchen (%50). They are sensitive to noise. % 50 of participants complained about noise problem. % 20 of participants mentioned about insufficient natural light. In house % 30 of participants complained about acoustical insulation problems, % 5 of participants complained about ineffective heating system. Depending on the answers of 20 participants, the design guidelines were created to meet the needs of patients.

**Keywords:** Dementia, Design for Dementia, Inclusive Design, Design for All, Universal Design

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## 1. Introduction

Dementia is an umbrella term to describe a set of symptoms that affect cognitive abilities, memory, thinking, and behavior. Alzheimer's disease is the most common cause or type of dementia, accounting for the majority of cases. It is a progressive neurodegenerative disorder that primarily affects memory and cognitive functions (Silverman, 2023). The condition of dementia includes symptoms such as memory loss and thinking problems. It generally affects elder people whose age is above 65. However, some people are diagnosed with dementia when they are in their 45 or so (Alzheimer's Society, 2024). Cankurtaran and Arioğlu mentioned in their journal about dementia and Alzheimer's that there is %12-18 in the European Union people who are between 45-60 years old (2011). Moreover, the Alzheimer's Society noted that "there are more than 40,000 people in the UK under 65 with dementia" (Alzheimer's Society, 2024). It is obvious from the estimated numbers that, it does not only affect old people, but it also affects people who are in their middle age. Despite the unusual numbers, dementia commonly affects old people. So, by the natural aging process, people tend to lose their sight and their mobility abilities. If the dementia illness is seen at the same time as the ageing process, results can be much more deleterious than it could be. Since it has psychological effects besides its physical effects as well. It is observed that dementia can cause depression, anxiety, and aggression as a side effect. Therefore, it creates big changes in people's lives in terms of behaviours. Desai and Grossberg stated in their study that dementia patients display some behaviours such as aggression, agitation, restlessness, and wandering (2001). Also, there are some psychological problems such as depression, hallucinations, and delusions (Desai and Grossberg, 2001).

Symptoms which are mentioned previously influence patients' well-being and their carers' lives negatively. Additionally, there is no definite cure for this illness. However, the effects of dementia can be minimized. Even though there is no definite cure for this illness, society can learn how to

deal with it by understanding and improving sufferers' lives. The main step of improving patients' lives starts with the improvement of the living environments of these patients. People's living environment is significant because it addresses their needs and interacts with them. It seems that interior designers are highly related to people's needs of living environment and how they experience the place. Designers and architects are mainly concerned about healthy people's living environment. However, some people have neuropsychological conditions such as people with Autism Spectrum Disorder, and some people have neurocognitive conditions such as Dementia. Designing for disadvantaged people is an overlooked topic. There is a big role for architects, interior architects, and designers. Designing for dementia patients is a significant topic in coping with the negative effects of the condition. Since their moods are affected by living environments. In the book called 'Mental Capital and Wellbeing' it is mentioned that physical environment can affect people mentally negatively or positively (Cooper et al. 2008). It implies that "Lack of an appropriate physical environment can stimulate the development of mental illness. Negative impacts are associated, for instance, with an increased level of agitation and anxiety leading to social isolation, disengagement from communal, physical, and educational activities" (Cooper et al. 2008:3). The reason to start this research is to create a positive atmosphere to support dementia friendly interior designs. Therefore, this study is done in the light of questions such as:

1. What are the handicaps in the current house design for dementia patients?
2. How can designers address current design problems?

## 2. Literature

Place perception affects the experience of the place. Dementia patients' way of seeing and interpreting realities is different than in comparison to healthy people. In the article which is called Improving Alzheimer's and Dementia Care: The Eyes Have it, Bier describes seven types of visual changes that dementia patients experience (PsychCentral 2013). Therefore, visual changes such as inability to perceive dimensionality, shrinking peripheral vision, high color contrast, need for brighter lighting, trouble with glare and shadows, need for greater simplicity, and right eye preference. It shows that sufferers perceive objects closer than they are. Since, their impaired vision they can only see front directions easily. Bier indicated with the experimenter research that "By putting the circled fingers to our eyes like binoculars, we get a good estimation of this limited view; the field of vision is about 12" in diameter in all directions. This means the Alzheimer's patient cannot see something unless it is directly in front of them at just about eye level" (PsychCentral 2013).

Moreover, they need to discern objects from one another which means that they need some contrasting colors or textures to differentiate them more rapidly. It is known that mainly most dementia patients are in the aging process, so they need more light on their impaired perception. However, lighting needed to be arranged according to the standards. Regarding this requirement, Dr. Paul Raia, one of the founders of HT, recommends significantly increasing the intensity of normal household lighting from 30-foot-candle power to 60- or 70-foot-candle power (Raia, 2011). Otherwise, if the specific data are not taken into consideration it may result in glare or shadows that can create confusion for patients. Thus, visual simplicity can be a core precaution to prevent patients' misperceptions and ambiguity. It is conceived that dementia patients' place perception varies in comparison to healthy people. They interpret reality in different ways so this may cause confusion and stress for them which affects their health and well-being negatively.

Since dementia patients have a different place perception. Chmielewski and Eastman mentioned the importance of a home-like environment while designing living spaces for dementia patients

(2014). It is also indicated that enabling residents' independence and understanding their both privacy and community needs are significant (2014). Moreover, Chimelewski and Eastman expressed that places should propose focused and appropriate stimulation, preventing distraction as well as mundane, boring atmosphere for its user (2014). Therefore, the design should be accessible because of their prior situation, and it should prevent the patients from wandering away.

Besides, responding to circulation in a living environment there are also some requirements that dementia patients need. Firstly, dementia patients can easily be "overwhelmed, confused and/or distracted when they are faced with large groups or spaces" (Chimelewski et. al 2014:6). In this case, they need arrangements for their daily routine, activities, and living style. Residents may feel better when they join small groups. According to Chimelewski and Eastman "These small-sized groupings support resident-centered care and personal relationships among the residents, their families, and professional caregivers — an important factor given that social support has long been known to affect an individual's emotional and physical health and general well-being" (Chimelewski et. al 2014:28). Circulation and spatial arrangement have the important role to create accessibility to dementia patients. Even healthy people can have problems accessing spaces if they are not designed precisely, so it is more likely for dementia patients to have some accessibility problems. Accordingly, some zoning systems should be developed to support dementia patients to map out their orientation. This zoning system is called 'wayfinding' in architectural planning. Kelly Bissel describes wayfinding as "Wayfinding is a general term that involves how an individual navigates their environment" (Bissel, 2010:1) Bissel suggests common solutions for wayfinding to create central hubs in spatial arrangements that can stem off from other spaces or creating a single path which looks like random corridor but should flow in building's form (2010). Creating a single path can provide more accessibility because it is hard to become disorientated when walking on one continuous route. It also differentiates flooring between other spaces and the central core. In this way, dementia patients can be much more aware of where they are standing while they are using the places. Dementia patients can have some problems in terms of decision-making. Therefore, if some decisions are made in the interior, it will be more helpful for them to navigate themselves.

Furthermore, In the book *Good Practice in Design of Homes and Living Spaces for People with Dementia and sight loss* there are some suggestions for design for dementia patients (Adams et. al, n.d). Color plays an important role while designing for dementia sufferers. It has a considerable amount of influence to visualize the preferred part of design or detail. Adams suggested that painting bathroom doors differently than other doors makes them more highlighted and it will make users identify more easily than the other ways (Adams et. al., n.d). Commonly, designers apply signage or labelling systems to identify the essential parts of the design. However, using the color method is more memorable and remarkable, especially for people who have cognitive disorders. By the process of aging, older patients' sight is affected. Therefore, it is highly possible for them to not read the signage or labels. In this case, it can seem that applying color and creating identification of elements for its users is a preferred option. There is also another suggestion that recommends using a range of colors on bedroom doors that are like specific users' previous houses' front doors. Also, it suggests getting help from contrasting colors. For instance, locating sockets, and handrails with the contrast color to the wall, makes them more readable and easier to use. Contrasting colors can be applied on furniture while placing it in front of walls. Adams exemplifies the application of contrast color in the bathroom. Since toilet seats are generally colored the same color as the commode 's color. Hence, it can make it not visible. To move

forward, toilet seats can be in contrast color with the toilet to identify and visualize it more accurately.

On the other hand, there are some potential hazards while applying contrast colors to the design. If the application is done not correctly, it will be open to unwanted accidents. Adams mentioned this point “Highlighting sharp edges with color draws attention to the danger that they may pose” (Adams et. al, n.d). Thus, while applying colors some vital parts that may cause hazards should be considered. It is also suggested to make step edges contrasted to stair treads and risers to increase safety.

Another significant design aspect is lighting which depends on the application. Lighting has a vital importance in the living environment, especially for people with dementia. They need more natural light, also more artificial lighting levels that can enhance their visibility. Besides, it positively affects dementia patients' mood. There is a study which is done in the Royal Netherlands Academy of Arts and Sciences, Amsterdam, by Rixt F. Riemersma-van der Lek (Jama, 2008). The study tries to explore the answer of how much bright light with or without melatonin supplements would affect symptoms of dementia (Jama, 2008). The study contains 189 elder people with dementia who are about 86 years old, mostly female at 12 elder care facilities in the Netherlands. Some participants took daily doses of melatonin which is a fake pill to make participants realize the placebo effect. The facilities turned their lights on each day from about 9 am to 6 pm; half of the facilities increased the intensity of their ceiling-mounted lights. After this study, results came up which are:

- Reduced cognitive decline on a mental status exam by a relative 5%.
- Cut depression symptoms by a relative 19%.
- Calmed slow increases in functional limitations by slightly more than half (53%) (Jama, 2008)

It can be understood from studies that the simple measure of increasing the illumination in facilities affects cognition, behaviour, and mood positively. Additionally, the lighting level should be arranged consistently. Since sudden changes may affect dementia patients and it may cause misinterpretation. Therefore, sudden changes in lighting can cause glare, and inconsistent lighting levels on some parts of the components of interiors. If the design has good color rendition, that means it has low glare and uniformity in lighting. So, these features can be considered as dementia-friendly lighting. As mentioned before daylight is important for dementia patients' well-being, and usage of place as well. There are some recommendations about this concern that introduce how to improve daylight in a room. Ricky Pollock suggests that average daylight in a room can be improved if some conditions are accomplished (n.d). For instance, the light transmittance of the windows should be greater; windows should be large enough in comparison to the room's size. In addition, it is suggested by Ricky Pollock that the average reflectance of the interior surfaces is higher (Pollock, n.d). It is known that effective daylighting can be provided up to some extent. In this respect, artificial lighting is essential. The number of lighting fixtures that are used is important. Ricky Pollock mentioned that using 5 fittings of lighting instead of 3 is an essential way to improve lighting in interiors (Pollock, n.d).

Additionally, the Dementia Services Development Centre advises ensuring good signage methods that are mounted for older people (2013). Since ambiguous signage systems may confuse users. Secondly, ensuring the easy perception of the kitchen and bathrooms is highly significant because they are basic needs. Thus, people can see important rooms such as toilets as easily as possible (DSDC, 2013). Also, all doors should be visible enough to provide accessibility. People with dementia have no time or date notion. That is why, they need to remember which date and time

they are living in. In this case, illuminated clocks and calendars can be supplied in the required places.

### 3. Methods

This study investigates the appropriate way of design for individuals who have Alzheimer's disease in the light of two main questions as below:

1. What are the handicaps in the current house design for dementia patients?
2. How can designers address current design problems?

These research questions were answered through qualitative research methods. Qualitative research is defined as "research in which qualitative data collection techniques such as observation, interview, and document analysis are used, and a qualitative process is followed to reveal perceptions and events realistically and holistically in the natural environment" (Yıldırım and Şimşek, 2008: p.39). The approach of the qualitative method includes interviews, observations, document reviews, and focus group studies. In this study, the research tool is a survey. The data were collected by the survey for dementia patients who have mild levels of Alzheimer's disease. 20 Alzheimer's patients joined the survey through the allowance of their families.

The collected data was analysed by the descriptive analysis method. Analysis was made in the light of design aspects such as acoustics, lighting, and environment. Another category is psychological response to the designed house and environment. It is investigated through some questions, as shown in Table 2. The answers were prepared as an open-ended question type. In this way, more detailed answers could be taken from participants. To reveal the opinions of the participants in-depth, the descriptive analysis method, which is one of the qualitative data analyses, was used (Karataş, 2015: p.73). The findings were obtained from answers to the survey. It was summarized and interpreted using the descriptive analysis method.

#### Study Group

Alzheimer's disease has some levels which can be mild or severe. To answer questions, participants need to perceive the question and reply accordingly. Therefore, selected participants have mild level of Alzheimer's. 20 participants joined to the study. 12 (%60) of the study group is female and 8 (% 40) are male. 4 (% 20) of participants are over 80 years old. 8 (%40) of participants are over 70 and 8 (%40) of participants are over 60 years old.

In consideration of educational background, 14 (%60) of the participants graduated from high school, 1 (% 20) participant graduated from elementary school and 1 participant (% 20) couldn't get any education. To analyse the suitability of the design, the living duration of occupants is significant. Therefore, 4 (%20) of participants have been living in the same house between 0 to 10 years. 8 (% 40) of the participants have been living in the same place between 20-30 years. Lastly, 8 (% 40) of the participants have been living in the same place between 40-50 years. This study depends on voluntary basis. Therefore, all participants accepted the informed consent.

#### 3.1. Survey

This study is conducted on a voluntary basis. Participants are grandparents and grandmothers of immediate surroundings. To get tangible results from the survey, the severity of Alzheimer's disease is important as well as the participants' willingness to answer. Participants who have mild levels of Alzheimer's answered 17 different types of questions. Questions were designed

according to design aspects such as acoustics, lighting, and environment. Also, questions discover psychological reaction to the designed environment. The first 4 questions related to participants' imprint information such as gender, age, education level, and duration of residence. 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, and 17<sup>th</sup> questions are open-ended type of questions to receive more ideas from participants. 9<sup>th</sup> to 16<sup>th</sup> questions is designed as a closed-ended questions for certain answer.

The 5<sup>th</sup> and 6<sup>th</sup> questions are related to the psychological reaction of participants to the interior design of house. 5<sup>th</sup> question investigates design-based happiness and 6<sup>th</sup> question searches what the reasons of design-based unhappiness are. 7<sup>th</sup>, 8<sup>th</sup>, and 9<sup>th</sup> questions try to comprehend the design of the living environment. 7<sup>th</sup> question is for the participants' interpretation of the house's interior design. 8<sup>th</sup> question is to understand the limitation of interior design. The 9<sup>th</sup> question discusses the acoustical aspect of the design. The 10<sup>th</sup> question discusses lighting. The 11<sup>th</sup> question is related to the environment, and the 12<sup>th</sup> question is related to environmental satisfaction. The 13<sup>th</sup> question is related to the expected interior architecture of the house. The following 14<sup>th</sup> question discusses the room design satisfaction of the occupant. The last questions which are 15, 16, and 17 discuss wet areas and their accessibility.

Questions are listed below:

- 1<sup>st</sup> Question: Gender
- 2<sup>nd</sup> Question: Age
- 3<sup>rd</sup> Question: Education Level
- 4<sup>th</sup> Question: Duration of Residence
- 5<sup>th</sup> Question: What are the things that make you happy to live in this house?
- 6<sup>th</sup> Question: What are the things that make you unhappy while living in this house?
- 7<sup>th</sup> Question: What do you think about the interior design of your house?
- 8<sup>th</sup> Question: What are the handicaps of the current interior design of the house?
- 9<sup>th</sup> Question: Is there any noise problem in the house?
- 10<sup>th</sup> Question: Is there enough sunlight in the interior?
- 11<sup>th</sup> Question: Are there any social areas in the apartment/ house or surroundings?
- 12<sup>th</sup> Question: Are social areas satisfying?
- 13<sup>th</sup> Question: How would you like the interior design to be?
- 14<sup>th</sup> Question: Are you satisfied with your room's design?
- 15<sup>th</sup> Question: Do you have your own bathroom?
- 16<sup>th</sup> Question: Can you access and use the bathroom easily?
- 17<sup>th</sup> Question: What are the handicaps that you experience during the usage of bathrooms?

In the light of questionnaire, it's easy to perceive the limitations and problems of the current design approach. Questionnaire has various aspects such as design factors and its psychological and physical effect. Thus, specific aspects of design such as lighting, acoustic, accessibility were investigated, and solutions can be recommended.

## 4. Survey Data

The first 4 questions were designed to understand the features of the participants. From the 5<sup>th</sup> question to the 17<sup>th</sup> question review of the design for Alzheimer's can be displayed. 5<sup>th</sup> question (What are the things that make you happy to live in this house?) towards to perceive the atmosphere of the place and identifying which types of atmospheres create happiness in Alzheimer's patients. The participants replied to the 5<sup>th</sup> question differently. 11(%55) participants answered, "They like familiarity. Therefore, living in a house and district for a long time created



happiness for them". 6 (%30) participants declared that "They like to live with their children in the house". 3 (% 15) participants' answers to 5<sup>th</sup> question were related to natural lighting in the house. A participant mentioned that in the morning, she likes to watch natural light. So, enough amount of natural light is making her happy.

Controversially, 6<sup>th</sup> question discusses the factors that make participants unhappy (What are the things that make you unhappy while living in this house?). Mainly, participants complained about noise problems due to the settlement of many buildings in the neighbourhood (%60, 12 participants). 4 (% 20) participants mentioned that their place doesn't have enough natural lighting. The rest of the participants were neutral in their answer (%40, 4 participants). 7<sup>th</sup> question (What do you think about the interior design of your house?) explores the general attitude of participants regarding to design of their houses. 10 (%50) participants prefer more spacious rooms and kitchens. 6 (% 30) participants complained about insufficient natural lighting and noise. 4 (% 20) participants stated that there are spacious areas in their house to comfortably move.

The 8<sup>th</sup> question is about limitations of the current interior design of the house (What are the handicaps of the current interior design of the house?) 13 (% 65) participants mentioned about insufficient amount of natural lighting. 6 (% 30) participants mentioned about acoustical problems. For instance, one of the participants mentioned "Open planned house limits me to watch TV in very low voice due to the transmission of voice". Most of the concerns about acoustical problems are noise. Moreover, one of the participants (% 5) complained about the heating system and that she wished her house was insulated.

Acoustical design is significant for Alzheimer's patients' health. 9<sup>th</sup> question discovers the existence of a noise problem (Is there any noise problem in the house?). 12 (% 60) participants replied to the question as 'No'. 8 (% 40) participants replied as 'Yes'. Another essential design element is natural sunlight. 10<sup>th</sup> question (Is there enough sunlight in the interior?) towards natural sunlight. 12 (%60) participants think that it is enough, and 8 (%40) participants think it is not enough.

Another improvement in design is the availability of social places in apartments or near surroundings. Staying socially engaged with friends and family has been displayed to relieve stress which leads to better sleep and eating habits (Dementia Care Central, 2023). Availability of social areas was questioned by "Are there any social areas in apartment/ house or surroundings?" in the 11<sup>th</sup> question. 16 (% 80) participants answered 'No' and, 4 (% 20) participants replied 'Yes'. Additionally, depending on the 12<sup>th</sup> question's (Are social areas satisfying?) answers, 16 (%80) participants think that existing social areas are not satisfying for the participants. 4 (%20) participants think that social areas are satisfying.

13<sup>th</sup> question (How would you like the interior design to be?) regarding interior architectural design decisions. 5 (% 25) participants declared that they would like to have a minimal and functionally designed interior. One of participant who gave same answer added that 'Due to the complex design sometimes he loses himself and finds himself in the balcony'. 2 (% 10) participants complained about not having enough social area. It is explained by one of participant that she wished she had a relaxing place to spend time alone and do patchwork. She added that sometimes she confuses rooms so there would be wayfinding elements in interior design. Moreover, the noise problem was another concern. 6 (% 30) participants mentioned that there is a noise problem in the house due to a lack of acoustical insulation. 3 (% 15) participants' concern was related to not having an optimum lighting design and a spacious room and kitchen. The 14<sup>th</sup> question (Are you satisfied with your room's design?) try to explore the room's design.

Most participants (12 participants, %60) are not satisfied with the room design due to its size. Some of the participants (2 participants, % 10) wished that their window height would be enough to see the view.

Accessibility is significant for all, especially for elder people who are diagnosed with Alzheimer's. Particularly accessing the bathroom easily is an indispensable necessity. The 15<sup>th</sup> question asks if there is a private bathroom for participants. 12 (% 60) participants said 'No', and 8 (% 40) participants said 'Yes'. The 16<sup>th</sup> question (Can you access and use the bathroom easily?) is about the functionality and accessibility of the wet area. 16 (% 80) participants replied that they can access and use the bathroom easily. However, depending on the answers of 4 (% 20) participants accessibility and functionality of the bathroom is not easy. To perceive problems of bathroom usage, the 17<sup>th</sup> question (What are the handicaps that you experience during the usage of bathrooms?) is created. Some participants (16 participants, % 80) need handles in the bathroom. Another handicap is the height of the sink which is not suitable for participants (4 participants, % 20)

## 5. Analysis

Sustainability isn't only related to the application of recycled materials or the thought of duration of buildings. It is also about providing a home that addresses users' needs and creating a place that makes them live in the real sense. Therefore, empathic design is essential when designing for all and especially designing for groups that need special assistance such as people who are diagnosed with Alzheimer's. Therefore, empathy needs to take place when designing. Thomas and McDonagh (2013) stated that "Designers and developers of products and services need to rely on the importance of developing empathy with users to ensure that these products will resonate with individuals as opposed to the masses".

Closed-ended questions' answers help to draw a certain image of the current design. In terms of acoustical design, participants are mostly satisfied. % 60 of the participants evaluated the houses' acoustics positively (Table 1, Question 9). The lighting design of houses was evaluated by participants same as acoustic design. % 60 of participants are happy with the lighting design. However, % 40 of participants is not happy with the lighting design (Table 1, Question 10). Moreover, having a limited connection with the environment and social areas can affect patients' well-being negatively. % 80 of participants mentioned the unavailability of social areas (Table 1, Question 11). Also, % 80 of participants is not satisfied with the existing social areas (Table 1, Question 12).

Another part of the open-ended question is the examination of house design. In this part, participants were given some detailed answers. According to the 5<sup>th</sup> question's answer, it was perceived that participants are happy with familiarity (% 55) and a good amount of natural lighting (% 15). In the analysis of 6<sup>th</sup> question's answer, it was noticed that participants are unhappy about the noise problem (% 60) and insufficient natural light (% 20).

The 7<sup>th</sup> question discovers participants' thoughts about their houses' interior design. According to the 7<sup>th</sup> question's answer, which is displayed in Table 4, % 50 of participants require more spacious rooms and a kitchen. % 30 of participants demand more natural light. There are also handicaps or negative ways of design in the living environment. The 8th question's answers demonstrated participants' thoughts about handicaps in the house. The majority (% 65) of participants complained about the insufficient amount of natural light. The second handicap in the design of the house is the acoustical insulation problem. Thus, % 30 of the participants



declared there is an acoustic-based problem. % 5 of the participants think that the heating system is ineffective.

On the 13<sup>th</sup> question (How would you like the interior design to be?), houses' interior design decisions and their effect on the Alzheimer's patients. % 25 of participants stated that participants prefer minimal and functional interior design. % 10 of participants complained about unavailability of social areas. % 30 of participants mentioned that there is a noise problem in the house due to a lack of acoustical insulation. Lastly, % 15 of participants would like to have more amount of natural lighting and spacious rooms. The 14<sup>th</sup> question explores (Are you satisfied with your room's design?) room design and its effect on the participants. % 60 of participants are not contented by their room design because of its size. % 10 participants mentioned that window size heightened could be adjusted for seeing the view.

The wet areas are significant components of houses. Thus, lack of a private bathroom creates discomfort depending on the information gained by participants. It is important to have a private bathroom for privacy and a sense of belonging, especially for Alzheimer's sufferers. The 15<sup>th</sup> question asks if there is a private bathroom for participants. % 60 of participants said 'No', and % 40 participants said 'Yes'. The accessibility to wet areas has utmost importance to meet the users' needs. Hence, the 16<sup>th</sup> question (Can you access and use the bathroom easily?) is about the functionality and accessibility of the wet area. % 80 of participants mentioned that they can access wet areas easily and % 20 of participants cannot access easily.

Moreover, wet areas can be dangerous for elderly people if it is not designed according to their needs. There are many at-home accidents in wet areas. Home accidents happen, if the risk factor is available. Temel and Vaizoğlu (2018) mentioned that if the design is not accessible and adaptable for users that means there is a risk of home accidents. The 17<sup>th</sup> question examines, if participants face a problem during the usage of the bathroom. % 80 of participants mentioned that there is a need for handles/bars in the bathrooms. % 20 of the participants complained about dimensional problems of sanitary ware. Therefore, sanitary ware needed to be adjusted for the user.

*Table 1. Close-ended Questions Type Answers*

| Question                                                                | Positive Reaction | Negative Reaction |
|-------------------------------------------------------------------------|-------------------|-------------------|
| 9. Is there any noise problem in the house?                             | % 60              | % 40              |
| 10. Is there enough sunlight in the interior?                           | % 60              | % 40              |
| 11. Are there any social areas in the apartment/ house or surroundings? | % 20              | % 80              |
| 12. Are social areas satisfying?                                        | % 20              | % 80              |

*Table 2. Close-ended Questions Test*

|                        | Variation 1 | Variation 2 |
|------------------------|-------------|-------------|
| Mean                   | 40          | 60          |
| Variance               | 533,3333    | 533,3333333 |
| Observation            | 4           | 4           |
| Pearson Corelation     | -1          |             |
| Hypothesis             | 0           |             |
| df                     | 3           |             |
| t Stat                 | -0,86603    |             |
| P(T<=t) single tailed  | 0,225092    |             |
| t Critical single tail | 2,353363    |             |
| P(T<=t) double tail    | 0,450185    |             |
| t Critical double tail | 3,182446    |             |

*Table 3. Open-ended Questions Type Answers*

| Question                                          | Answers                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13. How would you like the interior design to be? | <p>% 25 of participants prefer minimal and functional house interior.</p> <p>% 10 of participants are not satisfied about unavailability of social spaces.</p> <p>% 30 of participants complained about noise problem.</p> <p>% 15 of participants wish to have more amount of daylight.</p> <p>% 20 of participants was hesitant to answer</p> |
| 14. Are you satisfied with your room's design     | <p>% 60 of participants not satisfied</p> <p>% 40 of participants satisfied</p>                                                                                                                                                                                                                                                                 |
| 15. Do you have your own bathroom?                | <p>% 60 of participants replied as 'No'</p> <p>% 40 of participants replied as 'Yes'</p>                                                                                                                                                                                                                                                        |
| 16. Can you access and use the bathroom easily?   | <p>% 80 of the participants can't access easily</p> <p>% 20 of the participants can access easily</p>                                                                                                                                                                                                                                           |

Table 4. Open-ended Questions Type Answers

| Question                         |                                                                               | Answers                                                                                                                     |
|----------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Design Based Happiness           | 5. What are the things that make you happy to live in this house?             | Familiarity (%55)<br>Good Amount Of Natural Lighting (% 15)                                                                 |
| Design Based Unhappiness         | 6. What are the things that make you unhappy while living in this house?      | Noise Problem (% 60)<br>Insufficient Natural Light (% 20)                                                                   |
| House's Interior Design          | 7. What do you think about the interior design of your house?                 | Preference of Spacious Rooms and Kitchens (% 50)<br>Demand for More Natural Light (% 30)                                    |
| Limitations of Interior Design   | 8. What are the handicaps of the current interior design of the house?        | Insufficient Amount Of Natural Lighting (% 65)<br>Acoustical Insulation Problems (% 30)<br>Ineffective Heating System (% 5) |
| Limitations Of Wet Areas' Design | 17. What are the handicaps that you experience during the usage of bathrooms? | Handles/Bar In The Bathroom Is Needed (% 80)<br>Dimensional Adjustment Of The Sanitary Ware Is A Must For Usage (% 20)      |

## 6. Recommendation

Depending on the survey, some design aspects are prominent when designing for people with Alzheimer's. It is found from the research that a good amount of natural light and familiarity at home brings happiness to people with Alzheimer's. On the other hand, insufficient natural light and noise make them unhappy. Individuals diagnosed with Alzheimer's prefer more natural light, spacious rooms, and kitchens. In addition to preferences, Alzheimer's patients find insufficient natural light, ineffective heating systems, acoustical insulation problems, not accessible bathrooms as handicaps of house design. In the light of these outcomes, design solutions are created according to the design problems that affect Alzheimer's patients' comfort. The recommendations according to the functions listed in below:

Bedroom: There mustn't be any obstacles such as tables or chairs on the passageway. The personal belongings which are used daily such as clothes should be placed in an open-shelf system to ease the usage. Also, on the nightstand or on the cupboards, names of clothes can be written on the furniture to find them easily. A minimum of 300 lux lighting is needed in bedrooms (Zazarin, M. and Aziz, Z., 2023). Warm colors such as beige can be preferred in the bedrooms to not create glare or any discomfort. Also, familiarity is important for dementia patients according

to the study (Table 4, 5th Question's Answer). Therefore, personal objects such as a picture that makes user happy or an item special for them can be placed in the bedrooms.

**Living Room:** The living room design needs to address the needs of patients. One of the requests from dementia patients is having good amount of daylight (Table 3 and 4). Therefore, big sized windows can allow ample amount of daylight. Reminiscent decorations (vintage magazines) on side table and shelf help stimulate memory and remind the person about a familiar period from their past (Alzheimer's Foundation of America, n.d.). Safety is the most important thing in living room and in all houses. Thus, sprinkler system must be placed. There is a risk of in-house accidents. Tables' and coffee tables' edges should be bevelled to not cause any harm.

**Kitchen:** The kitchens are places where motion is dense. Therefore, non-slippery floor materials must be preferred. Also, smart systems must be placed in case dementia patients forget to turn off stove or any other utensils. The functionality of kitchen is essential especially for the dementia patients. Hence, furniture design needed to be re-evaluated. Inside of cupboards need to be visible. Glass cabinet doors should be preferred. Additionally, reminders on closed cabinets or fridges should be used. To ease the usage, frequently used appliances should be placed on the countertop.

Indirect and shadow-free room lighting (500 lux at eye level) prevents visual hallucinations (Braun, A. et. al., n.d.). The kitchen needed to be designed for wheelchair user. Therefore, manoeuvre distance must be arranged. The wheelchair user needs minimum 150 cm x 150 cm area for 360-degree rotation (T.C. Aile, Çalışma ve Sosyal Hizmetler Bakanlığı, 2020).

**Bathroom:** Safety is highly important in the bathroom. Since wet areas are prone to accidents. Thus, handles inside the bathroom and on the door must be applied. Door handles and commodes' color should be dominant to differentiate them easily. Showers must be accessed without any steps. An emergency call button must be added in case there is a need. Sockets must be water-resistant with covers. A minimum of 300 lux lighting is needed (Burton, J. Dementia Enabling Environments). Clerestory windows can be preferred to let more light inside the place. Moreover, infrared lighting should be placed for nighttime usage.

Dementia patients often feel agitated and anxious. They need to find needed wares easily. Therefore, the open closets should be used to reach products easily (towels, toilet paper etc.). Curtain can be placed in front of the mirror to prevent reflection.

**Corridor:** The design of the corridor must be barrier free. Corridor walls must be supported with continuous handrails. Handrail should continue even on the doors to not prevent accessibility need of the users. The handrails and steps must be easily visible. This can be achieved by color contrasts. As a result of this application, accessibility will be easy and non-hazardous.

To sum up, safety is crucial for Alzheimer's patients due to the condition of the illness. Non-slippery floor materials such as vinyl, porcelain or ceramic tiles, hardwood, bamboo flooring, etc. can be applied. Handles and bars needed to be placed in wet areas, corridors, and wherever that user needed to walk for a particular time. Fire alarms and emergency buttons needed to be added to the rooms. Also, the smart house system can be useful for Alzheimer's patients. For instance, motion sensors on stoves will help to prevent in-house accidents.

Another enabler of accessible design is color. Color has a positive effect on psychology if it is used consciously. The usage of warm colors such as beige, orange, and brown has a positive effect on Alzheimer's patients. Furthermore, color can be used to provide safety. The usage of contrast colors of door handles, and railing with surroundings can make the user differentiate safety tools more easily.

Lighting has the utmost effect on all people, especially Alzheimer's patients. There is a high demand for natural lighting when in consideration of survey results and literature. Therefore, openings in rooms and clerestory windows in bathrooms and kitchens can be provided. Moreover, following the rules for lux levels of lighting is essential when designing for dementia. In the bedroom and bathroom, a minimum of 300 levels of lux is needed. In kitchens, a minimum of 500 lux level is needed.

In addition to all design factors, furniture design is crucial. Furniture can be built-in furniture or mobile. The furniture's corners should not be sharp. Bevelled corners of furniture prevent damage for users if they fall or crash into the furniture. Furniture design should depend on usage frequency. Therefore, kitchen cabinets and wardrobes should have open parts for daily usage of stuff. The usage of glass cabinet doors can be an alternative for visibility of stuff that makes easy access and less complication for the user. The reminders on closed cabinets can be useful. So, the place of reminders can be designed in furniture as well.

Depending on the literature and findings, Alzheimer's patients would like to find familiarity in their houses. Also, they frequently mention about their past. Therefore, some objects, colors, textures, and photos can be used as a reminiscence element while designing. Designing for dementia patients has some personal aspects as well as objective ways. The personal aspect of design is related to patients' past and their preferences. When considering answers, it is perceived that most dementia patients need acoustically insulated built environments, more natural light, and spacious rooms.

## 7. Conclusion

It is found that Alzheimer's patients enjoy having familiarity in house. They also prefer minimal, functional house interior. The participants also complain about unavailability of social spaces. Therefore, they are not satisfied by social aspect of the places. Moreover, they would like to have more spacious areas and good amount of daylight in interior. There are accessibility problems in bathrooms. It is declared that they can't access bathrooms easily.

Regarding to these handicaps in house interior design, all the design solutions were mentioned on the previous section (Recommendation). Before improving all the aspects of design at houses, it is beneficial to understand that personalization is essential for Alzheimer's patient when designing house for them. Since each patient is different. Therefore, learning what is familiarity for them, what are the things that they don't want to see is key for interior architects while applying standard design guideline.

## 7. Bibliography

- Alzheimer's Foundation of America (n.d) The Apartment. <https://alzfdn.org/wp-content/uploads/2021/03/The-Apartment-Guide-web.pdf>.
- Adams, G. , Bowes, A., McCabe, L. and Dawson, A. (n.d) Good Practice in design of homes and living spaces for people with dementia and sight loss. University of Stirling. <https://social-care.org/wp-content/uploads/2023/06/Good-practice-in-the-design-of-homes-and-living-spaces-for-people-with-dementia-and-sight-loss.pdf>.
- Alzheimer's Society. What Causes Young- Onset Dementia?. <https://www.alzheimers.org.uk/about-dementia/types-dementia/what-causes-young-onset-dementia>.

- BBH. (2014). How small design interventions can improve the lives of dementia sufferers. <https://buildingbetterhealthcare.com/how-small-design-interventions-can-improve-the-lives-of-dementia-sufferers-99727>.
- Bissel, K. (2010). Designing for those dementia using the principle of wayfinding.
- Burton, J. (2025). Dementia Enabling Environments. <https://www.enablingenvironments.com.au/about.html>.
- Braun, A., Zanchetta, M., Hu, R., and Pawlitza, K. (2018). MAK – Modular Assisted Kitchen for Dementia Sufferers. [https://www.researchgate.net/profile/Rongbo-Hu/publication/324571467\\_MAK\\_-\\_Modular\\_Assisted\\_Kitchen\\_for\\_Dementia\\_Sufferers/links/5b0c4f22a6fdcc8c25364a75/MAK-Modular-Assisted-Kitchen-for-Dementia-Sufferers.pdf](https://www.researchgate.net/profile/Rongbo-Hu/publication/324571467_MAK_-_Modular_Assisted_Kitchen_for_Dementia_Sufferers/links/5b0c4f22a6fdcc8c25364a75/MAK-Modular-Assisted-Kitchen-for-Dementia-Sufferers.pdf).
- Cankurtaran, M and Ariogul, S “Demans ve Alzheimer Hastalığı “(2011) Mised 11-12 (2011).
- Chmielewski, E. and Eastman, P. (2014). Excellence in Design: Optimal Living Space for People With Alzheimer’s Disease and Related Dementias. AFA. <https://alzfdn.org/wp-content/uploads/2017/11/Excellence-in-Design-white-paper-June-2014.pdf>.
- Cooper, C., Field, J., Goswami, U., Jenkins, R., and Sahakian, B. (2008) Mental Capital and Wellbeing. Wiley-Blackwell. <https://doi.org/10.1192/BJP.BP.109.075473>.
- Dementia Services Development Centre. (2013). Improving the design of housing to assist people with dementia. University of Stirling, 35. [https://www.housinglin.org.uk/assets/Resources/Housing/OtherOrganisation/DSDC\\_dementia\\_design.pdf](https://www.housinglin.org.uk/assets/Resources/Housing/OtherOrganisation/DSDC_dementia_design.pdf).
- Desai, A. K., & Grossberg, G. T. (2001). Recognition and Management of Behavioral Disturbances in Dementia. in Primary care companion to the Journal of clinical psychiatry, Vol 3(3), p. 93–109. <https://doi.org/10.4088/pcc.v03n0301>.
- JAMA, (2008) Effect of Bright Light and Melatonin on Cognitive and Noncognitive Function in Elderly Residents of Group Care Facilities. <http://jama.jamanetwork.com/article.aspx?articleid=273623>.
- Karataş, Z. (2017). Sosyal bilim araştırmalarında paradigma değişimi: Nitel araştırmanın yükselişi. Türkiye Sosyal Hizmet Araştırmaları Dergisi, Vol. 1(1), p. 73. <https://dergipark.org.tr/tr/pub/tushad/issue/31792/350444>.
- Morgan Woodwork Organization. (1921). Building Assurance. Chicago, USA: Morgan. <https://archive.org/details/BuildingWithAssurance/page/n5/mode/2up>.
- PsychCentral “Improving Alzheimer’s and Dementia Care: The Eyes Have it” (2013). <http://psychcentral.com/lib/improving-alzheimers-and-dementia-care-the-eyes-have-it>.
- Raia, P. (2011) Habilitation Therapy in Dementia Care. in Age in Action. Vol. 25, No. 4. <https://vcoa.chp.vcu.edu/media/chp-college-of-health-professions/vcoa/docs/age-in-action/AgeinActionFall2011.pdf>.
- Rockfon. <https://www.rockfon.co.uk/about-us/blog/2023/designing-for-dementia-creating-a-safe-and-comfortable-interior-environment>.
- Sievert, D. (2023). Alzheimer’s Vs Dementia- What is The Difference?, <https://medschool.ucla.edu/news-article/alzheimers-vs-dementia-what-is-the-difference#:~:text=In%20summary%2C%20dementia%20is%20an,own%20distinct%20causes%20and%20characteristics>.



- T.C. Aile, Çalışma ve Sosyal Hizmetler Bakanlığı. Erişilebilirlik Kılavuzu. [https://webdosya.csb.gov.tr/db/meslekihizmetler/menu/erisilebilirlik\\_kilavuzu\\_2021\\_20231122101955.pdf](https://webdosya.csb.gov.tr/db/meslekihizmetler/menu/erisilebilirlik_kilavuzu_2021_20231122101955.pdf).
- Wikimedia Commons. (2025). <https://commons.wikimedia.org/w/index.php?search=glass+kitchen+cabinet&title=Special%3AMediaSearch&type=image>.
- Yıldırım, A. & ŞİMŞEK, H. (2005). Sosyal Bilimlerde Nitel Araştırma Yöntemleri Güncelleştirilmiş Geliştirilmiş 5. Baskı, Seçkin Yayıncılık, pp:39 , ISBN 9750200071. <https://dergipark.org.tr/download/article-file/63326>.
- Zazarin, S., Aziz, Z., and Sern, C. (2023). A Study on Daylight Conditions of Dementia Care Facilities in Malaysia. Jurnal Kejuruteraan SI 6(1) 2023: 89-102. [https://doi.org/10.17576/jkukm-2023-si6\(1\)-09](https://doi.org/10.17576/jkukm-2023-si6(1)-09).

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