Designing for People with Alzheimer's Disease: The Case of Halk Vakfı Senior Care Center, Iskele, North Cyprus

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ABSTRACT

This thesis focuses on Alzheimer's disease, a progressive and permanent type of dementia where changes in the brain or cognitive capability occurs leading to impairment of memory. As the physical and social environments of these people become more demanding to tackle over time, a dementia-friendly indoor and outdoor environment can help people with Alzheimer's reach their full potential, gradually increasing the quality of life for patients, their families and staff.

Designing for people with Alzheimer's requires the architect be knowledgeable about patient's needs and capabilities, the social and cultural activities they can engage in, as well rules and regulations relating to design standards. Within this perspective, the thesis aims to construct a linkage between Alzheimer's disease and necessary criteria that should be considered for the design of senior care centers, where Alzheimer's patients are usually taken care of as well as other elderly.

For this purpose, the research emphasizes important findings from the literature review relating to the characteristics and stages of Alzheimer's disease (AD) and examines various national and universal design guidelines on how to create senior care centers for people suffering from AD. The literature review also includes detailed recommendations on how to design appropriate indoor and outdoor spaces for AD patients. The third chapter comprises two precedents/best practice examples from around the world, the "VA Illiana Health Care System Community Living Center" in Danville, USA and Hogeweyk Dementia village in the Netherlands designed solely for people with Alzheimer's disease who come from different

countries. The fourth chapter is the case study analysis where Halk Vakfı Senior care center in Iskele, North Cyprus is reviewed on the basis of criteria formed previously. Then, the findings of the analysis is presented in chapter five, where some proposals are suggested for improving the weaknesses discovered in the center so that a better quality environment can be created both for people with Alzheimer's, their families and staff.

All in all, this thesis aims to emphasize the importance of creating suitable living conditions for seniors who suffer from Alzheimer's, through the application of design guidelines so that appropriate indoor and outdoor spaces can be created for them. This is an effort to generate more awareness on AD so that conditions in care centers can be improved relating to the physical space quality as well as social and cultural activities that can benefit the patients.

Keywords: Alzheimer's disease, Universal design principles, Senior care center building design, Indoor and Outdoor Space organization.

ÖZ

Bu tez, kalıcı ve ilerleyen bir demans tipi olan; ve beyin ve algısal beceride değişikliklere neden olarak hafızanın süreli olarak zarar görmesini sağlayan Alzheimer hastalığı üzerine odaklanır. Hastalar zaman aşamında fiziksel ve sosyal çevreleri ile daha zor ilişki kurdukları için, demans dostu iç ve dış mekan tasarımı hem Alzheimer hastalarının ful potensiyellerini kullanmalarına hem de zaman aşamında kendilerinin, ailelerinin ve onlara bakan sağlık personelinin yaşam kalitelerinin artmasına neden olacaktır.

Alzheimer hastaları için tasarım yapmak mimarın bu tip hastaların ihtiyaçlarını ve yapabileceklerini; onların sosyal ve kültürel aktivitelerini; ayrıca tasarım ile alakalı yasal düzenlemeleri anlaması ile mümkün olacaktır. Bu çercevede Alzheimer hastalığının belirtilerinin ve devrelerinin daha iyi anlaşılması ve genellikle yaşlı bakım evlerinde kalmak durumunda olan Alzheimer hastalarının ihtiyaçlarının da daha iyi anlaşılmasını sağlayacak ve bu mekanların tasarımına da olumlu yönde katkı koyacaktır.

Tezin ikinci bölümünde, hastalığın özellikleri ve devrelerine ilişkin yazın taramasında karşılaşılan önemli bulguların altı çizilmektedir. Bir sonraki bölüm de ise tasarıma ışık tutması açısından çesitli ülkelerin yasal standardlarına bakılmakta ve ortak kriterler oluşturulmaktadır. Bu veriler ışığında incelenen ABD'nin Danville eyaletinde"VA Illiana Sağlık Hizmetleri Halk Merkezi" ve Hollanda'da bulunan 'Hogeweyk Demans köyü' örneklemlerinden çıkarılan sonuçlar ise Alzheimer hastaları için iç ve dış mekanda uyulması gereken önemli tasarım kurallarına dikkat

çekmektedir. Bu bilgilerin ışığında ise dördüncü bölümde Iskele, Kuzey Kıbrıs'da konumlanan Halk Vakfı Yaşlı Bakım Evi incelenmekte ve sonuç kısmında burada yaşayan Alzheimer hastalarına, yakınlarına ve onlara bakan sağlık personelinin yaşam kalitesini artıraca iç ve dış mekana ilişkin bazi iyileştirici öneriler sunulmaktadır.

Anahtar Kelimeler: Alzheimer hastalığı, Evrensel Tasarım Prensipleri, Yaşlı Bakım Evi Tasarımı, İç ve Dış Mekan Organizasyonu

TO MY PARENTS

for always supporting me and believing in me

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INTRODUCTION

Memory is key for self-identity and well-being. Any change in the performance of the memory can cause serious damages to human life; and accordingly, to the way of their living. Alzheimer's is one of the most complicated mental diseases known to human. It is an illness that gradually changes a person's life, in terms of their lifestyle, needs, performance and even their physical health.

In the further stage of the disease, some of these patients have to be brought to care centers; and since the majority of patients are elderly, those places are basically senior care centers. Therefore, it becomes important to design such places accordingly for enhancing the quality of life and also preparing appropriate spaces for the ones with Alzheimer's.

This thesis is a study on Alzheimer's disease and its relation with the built environment. It aims to investigate existing national and universal design guidelines for designing spaces for people suffering from Alzheimer's disease and come up with the design criteria most significant to shaping of senior care centers. Accordingly, it is necessary to examine and understand existing cases from different countries to appreciate how they are designed and the impact their space organization have on the quality of life of residents and their families.

1.1 Problem Statement

According to statistics given by the Alzheimer Association, around 44 million people around the world suffer from Alzheimer's and Dementia. Due to the disease's gradual improvement time line, most of the patients are in need of special care after the second stage of the disease and usually sign up to a local senior care. However, most of the senior care centers today, are designed according to the physical disabilities of the elderly, and there is not much consideration towards people who suffer from Alzheimer's. This is a problem in various parts of the world, making it crucial to design care centers considering the physical and social needs of these patients with Alzheimer's.

1.2 Aims, Objectives and Questions of the Research

This thesis aims to underpin essential design guidelines important for the physical and social needs of Alzheimer's patients, in specific to indoor and outdoor spaces. In order to come to an understanding of how this disease affects the mind and how aging deteriorates the body and senses, a literature survey is done for answering questions on the nature of the disease, which will hopefully shed some on how to design indoor and outdoor spaces to satisfy the physical and social needs of people with Alzheimer's disease. Therefore, this thesis will attempt to present some recommendations on how to improve the quality of indoor and outdoor spaces in order to enhance the quality of life of patients, their families and care takers. By looking at this disease's prevalence and the ever-growing population of elderly patients suffering from it, properly designed senior care centers are a must, all over the world. Hence, this project will focus on the design of indoor and outdoor spaces in senior care centers which will hopefully lead to breaking new grounds in designing better centers and help towards rehabilitating existing ones.

Accordingly, the research questions are:

1. What is Alzheimer's disease and how does it affect people's life?
2. What are the principles that should be considered in the design of senior care centers, which can cater for Alzheimer's patients?
3. What are the design criteria to be considered in the evaluation of indoor and outdoor spaces of senior care centers?
4. What are the weaknesses and strengths of Halk Vakfı senior care center in Iskele, Northern Cyprus in terms of indoor and outdoor space quality, considering the physical and social needs of Alzheimer's patients?

1.3 Research Methodology

This thesis utilizes qualitative research in its analysis. This includes onsite observation of selected senior care center, Halk Vakfı, which is located in Iskele, and these data was supported by interviews with staff and management, mapping and observation.

The data for the literature review is collected from various articles, books, theses and internet sources. Observations have been made for better understanding of the issue; and to illustrate the aims of the research. Successful examples (based on international design guidelines) from around the world are chosen for the precedent analysis in order to reach to more tangible results for obtaining common criteria for the analysis of the case.

Chapter 2

UNDERSTANDING DEMENTIA AND ALZHEIMER'S DISEASE

2.1 Introduction

There are a number of mental diseases with permanent damage to the lives of the patients mentally and also physically. Dementia is a kind of mental disease caused by various reasons. Alzheimer's is a disease related to Dementia, which causes multiple mental and physical disabilities such as memory loss and general bodily symptoms and many other symptoms to be listed. This disease has a major impact on the lives of patients who need special care even in the early stages. In order to have an understanding of the influences of Alzheimer's disease (AD), it is necessary to study this disease and its related issues.

2.1.1 What is Dementia-Related Disease Called Alzheimer?

Dementia is a general term for loss of memory and other mental abilities severe enough to interfere with daily life. It is caused by physical changes in the brain.

Alzheimer's is most common type of dementia and defined as "a disease marked by progressive loss of mental capacity resulting from degeneration of the brain cells (American Heritage Dictionary of the English Language, 2011). A German doctor named the disease by the name of Alois Alzheimer (1864 – 1915).

Alzheimer's is a form of senile dementia, a disease that affects the brain's motor skills and causes loss of memory that targets the elderly. However, dementia has

several types, stated by the Diagnostic and Statistical Manual of Mental Disorders. One of them is vascular dementia, which is caused by issues with blood circulation, specifically the brain; dementia can be caused by injuries or trauma to the head, or diseases caused by HIV, Parkinson's disease or Huntington's disease. There's also a type of dementia that is caused by drug abuse, medications or toxin exposure called substance-induced persisting dementia (American Psychiatric Association, 2000).

Dementia can be caused by more than one factor, according to the DSM-IV (American Psychiatric Association, 2000). Whereas psychiatrists are unable to diagnose the exact cause of dementia due to multiple etiologies ("etiology" refers to the cause of the disease).

Two types of Alzheimer's have been recognized by doctors: Early onset Alzheimer's is diagnosed in patients whom display the symptoms at the age of 65 or younger, on the other hand late onset Alzheimer's is diagnosed when patients display the symptoms at a later age of 65. The latter is mostly the case, with rare cases developing in people under 50.

Doctor Alzheimer was a neurologist; who specialized in nervous system illnesses. He pioneered studying of the brain's structure, conducting many experiments using silver nitrate to expose what makes up brain cells. Some of his other examinations focused on nerve fibers and endings in the brain and central nervous system. He was especially interested by unusual nerve cells in the cerebral cortex; the brain part that houses mental functions like memory.

It was in 1906 when Doctor Alzheimer reported a middle-aged patient that had a distinct sickness in her cerebral cortex. The patient suffered from progressive memory loss and overall lack of orientation. She would forget people's names and believed to be persecuted. She acted paranoid, often hiding objects with no logical explanation. She later became incapable of moving or communicating with people, when she passed away, she was cringing and powerless in her bed (T.Rolls, 2016).

That was the first case that was identified as "Alzheimer's disease", although the name came to fruition later. Doctor Alzheimer referred to the case as "prehensile dementia" or a form of dementia that developed in a non-elderly patient, as the woman was 51 years of age when she was diagnosed, passing away at 55, which would be categorized as a relatively young patient today. In that day, senile dementia, also known as senility, was believed to have been brought on by the regular aging process, which raised many eyebrows in the medical community when Doctor Alzheimer reported so. Because at that time, senility was defined as a characteristic of aging, and doctors in Alzheimer's era had never come in contact with a patient that was yet to enter the declining years, yet suffered from dementia; as they believed it only occurred in elderly patients and caused by a decline in physical and mental abilities (Nadelson, 1999).

2.1.2 The Outward Signs of Alzheimer's Disease

Alzheimer's disease causes many changes in the human brain, but those changes are not detected until an autopsy is performed after the person's death to discover the cause of death. So, doctors usually diagnose the disease by inspecting physical symptoms.

Two main symptoms play a role in the diagnosis of Alzheimer's disease. The first one is the patient's impaired memory, as well as additional "cognitive disturbances." The latter include many disturbances such as Aphasia, which is a deficiency in communication coherently via speech or writing or even understanding the language or writing. Apraxia, which is when patients face a certain difficulty when performing normal physical movements when there's no cause for a person to be impaired. Agnosia, which is when a patient has difficulty to identify or name everyday objects, despite having normal sensory functions. And lastly disturbed executive functioning, where patients have difficulty organizing and/or planning and putting things in order. The DSM-IV (American Psychiatric Association, 2000) states that "each cause significant impairment in social or occupational functioning and represent a significant decline from a previous level of functioning" (Weiner & Lipton, 2009).

Patients who suffer of Alzheimer's disease are not affected greatly all at once, but they lose their memories and thinking abilities over periods of time that could be months or years. Sometimes those symptoms caused by the disease are so unnoticeable that the people surrounding the patient only realize what was happening when they look back at things years later.

"The memory-erasing disease" is what Alzheimer's disease has been called through time. People believe that patients of the disease live in their own little abstract worlds and that the patients are usually confused and helpless and their families are unable to penetrate their domains. But that is not exactly accurate. Even in the later stages of the disease, some people have long periods of stability, and they welcome "plateaus". Doctors are still unsure why those patients experience those normal interludes and

others struggle from a decline that gets worse over time (Alzheimer's Association, 2006).

Elderly patients often deny they have Alzheimer's because they may be underestimating how serious their memory loss is. Patients with "marked cognitive impairment" deny their illness ever more than people who suffer from mild impairment.

If the patients are not yet in the age of retiring, their problems on the job would increase significantly, as they become less productive thus causing others to take more of the work to pick up their slack. They often forget to return calls or respond to E-mails, they may also forget their appointments. As their state advances, they show up less and less in work and their coworkers and customers report that patients lose their job or retire early. They may even get anger tantrums where they engage in angry arguments with other people that may even escalate to physical violence. Those tantrums end just as fast as they happen. The patients return to their casual calm state but their loved ones are left confused and upset. Their symptoms may not even be apparent to the casual observer. As they react graciously and kindly in public. Those close to them who have contact with them regularly can only notice their symptoms.

Their sleep becomes irregular; they could wake up and wander during the night and may be disoriented. Their appetite is also affected; it may increase or decrease. Another important symptom of the disease is the three Ds: delusion, depression and delirium. Most patients suffer from similar symptoms but some of them may display more noticeable symptoms. According to the DSM-IV, there are four subtypes of

Alzheimer's disease, depending on the predominant feature of the sickness in a patient (Check, 1989).

- Alzheimer's type Dementia with delirium: patients are often disoriented, confused and excited. They also suffer from hallucinations.
- Alzheimer's type Dementia with delusions: patients believe in things that are not happening in reality.
- Alzheimer's type dementia with depressive moods: In those cases, patients display symptoms of depression.
- Alzheimer's type dementia uncomplicated: where none of the afore mentioned symptoms seem to be prominent.

In most cases, patients of Alzheimer's will cease to be able to function without assistance; families of the patients admit them to a residential-care facility. As the illness advances, patients barely communicate anymore. They do not converse with others and do not answer questions, they may not even be aware of another person being with them in the room. And they are unable to leave their beds at all times.

In most cases, patients of Alzheimer's live five to fifteen years after the symptoms become prominent. In the end, they seem to be oblivious to their surroundings and are completely adrift alone.

And that is why it is no surprise that Alzheimer's is known as the "disease of the century" because it seems that no one has immunity towards it.

2.1.3 The Effects of Aging on the Body

Alzheimer's usually affects people over the age of sixty-five. The patients find difficulty with coping with cognitive challenges that the disease poses, as well as the effects of aging on their bodies. The process affects how the human body deals with the surrounding environment, specifically via the five senses. And the best way to create a functional environment for the elderly is by understanding those sensory changes (Edelson, 1990).

- Sound

Ears are designed for hearing, as well as to maintain balance. Both of these capacities are weakened amid the aging process. Liquids and little hairs in the ear canal trigger nerves that empower the cerebrum to look after adjust. In maturity, the structure of the ear breaks down, the ear drum thickens, and the capacity to keep up balance is changed. Sharpness of hearing can diminish as ahead of schedule as age 50. This might be ascribed to the mind's diminishing capacity to make an interpretation of sound and translate it to important data. Age-related hearing problems are called Presbycusis. It is normal among people over age 65, particularly those who were presented to large amounts of noise prior in life. While portable amplifiers and hearing aids frequently make up for such hearing-loss, the outline of the physical environment can be responsive to changes to the ability of hearing. Endeavors to diminish or take out background noise can make discussions less demanding. Material decision can likewise improve the acoustic nature of the manufactured environment (Gibson, 1983).

- Sight

Changes in the eye may commence in age 30. The eye produces less tears, prompting to uncomfortable dry eyes. By age 60, the pupil, which controls the measure of light that enters the eye, shrinks to around 33% of its size than it was at age 20. The pupil responds all the more gradually, particularly in connection to low or strong light. The focal point of the eye, which concentrates light on the retina, changes to yellow and cloudy. The muscles surrounding the eye change as well, limiting the eye's capacity to move freely. These physical changes modify the way a human encounters their general surroundings. Glare turns out to be more purported and less bearable than ever before. This makes driving at night difficult. Acclimation to changing light conditions gets to be troublesome. Since eye development is limited, peripheral vision is diminished. Losing color of the eye's focal point makes it difficult to recognize blues and greens. Visual keenness generally decays (Lippa, 1992).

- Smell and Taste

Taste is identified with the feeling of smell. Scents animate nerve receptors in the nose, which convey with the mind a specific smell. The tongue is created of a huge number of taste buds, which perceive sweet, salty, bitter, and sour tastes. Together, smell and taste contribute toward our satisfaction in food. Smell is also connected to memory. (Juhani Pallasmaa, 1996) has been defined that, "A specific odor makes us unwittingly re-enter a space that has been totally deleted from the retinal memory; the nostrils stir an overlooked picture, and we are allured to enter a clear fantasize. The nose makes the eyes recall."

At about age 40 to 50 in females, and 50 to 60 in males, the number of taste buds starts to diminish. The feeling of taste is not generally lost in seniority. Be that as it

may, if taste sensation is compromised, sour and bitter tastes overcome sweet and salty ones. Correspondingly, the feeling of smell can remain in place into the later years of life, and is not regularly bargained until after age 70. Loss of the faculties of taste as well as smell can prove to be dangerous, as people can no longer perceive hazardous scents. Powerlessness to appreciate food can prompt to nourishing decay and depression. The body's diminished capacity to create spit makes gulping and absorption troublesome.

- The Haptic Sense

Nerve receptors all through the body send data to the cerebrum, which is then handled as pleasant, unpleasant, or neutral sensations. These nerve receptors help the body manage temperature and perceive changes inside the body. Elderly people regularly experience issues recognizing amongst hot and warm or cold and cool temperatures. Affectability to pain or pressure in the body is diminished. While it is unclear what the exact purpose behind these changes is, diminished blood stream to the nerve receptors in the body might be one cause.

Diminished temperature affectability can mean an expanded chance for hypothermia or burns. Older individuals frequently have trouble detecting where their body is in connection to other objects, or the ground, and tend to fall all the more often. Since the elderly are less sensitive to pain, their bodies ought to be all the more checked for wounds that they may not know of. Affectability to pain and slight touch might be diminished, however this is not generally the situation. Thinning skin after the person turns 70 may expand affectability to fine touch (Ellis, 2013).

It is frequently noticed that contemporary society is becoming more and more visually driven, or reliant on vision as the essential sense. Of the five senses, vision and hearing are the two senses that are affected the most from the aging process. A more noteworthy appreciation for the senses as an entire system should be accomplished, in order to sustain aging adults with the ability to interact with their environments with what senses they have left. This is particularly vital when relating to those with Alzheimer's and different types of dementia. At the point when memory is decaying, ordinary verbal correspondence might be inconceivable. Association through smell, taste, sound, and touch can keep people driving meaningful lives (Namazi & Johnson, 1992).

2.1.4 Progression of Alzheimer's Disease

Alzheimer's disease (AD) is a progressive disease, which implies that side effects increase after some time. How quick the disease advances, and what side effects may take after, differs for each individual, yet symptoms appear over some similar general stages in all people. AD in the end influences all mental capacities, including memory, movement, dialect, conduct, judgment, and unique thinking.

Specialists and doctors utilize various scales to measure the movement of indications after some time, which can characterize upwards of seven unmistakable phases of the disease (Reisberg, 2007). With AD, three expansive stages are ordinarily perceived: mild, moderate, and severe. The manifestations normally observed in every stage are abridged in this part, however it is vital to understand that there may be some overlap among the stages and that individuals may not encounter every single one of these side effects.

2.1.5 Stages of Alzheimer's Disease

Arranging systems give valuable frames of reference to seeing how the disease may unfurl and for making tentative arrangements. Yet, it is essential to note that not everybody will encounter similar manifestations or advance at the same rate (Alzheimer's Association, 2006). Moreover, "AD commonly grows gradually and causes a continuous decrease in intellectual capacities, mostly over a time period that could span seven to ten years" (mayoclinic, 2006). "After symptoms start, individuals live, all things considered, 8 to 10 years" (Alzheimer's Association, 2006) "As specified before, progression is erratic. Usually, intellectual side effects show up at the start of the illness to 3 years after onset, numerous times before the diagnosis" (Check, 1989). Functional and behavioral issues come afterwards and can be seen at any time between 1.5-6 years. Placement in a nursing home might be required anytime from 2.5-year on wards murder to keep the body going or by another illness. Staging systems are thought to be useful for seeing how the sickness, for the most part advances. A number of Staging Systems have been created to portray progression of AD. Different stages of Alzheimer's disease will explain in the following subchapters.

- The Three-Stage Model

It is hard to put a patient with AD in a particular stage, since each person with Alzheimer's advances in an unexpected way. Be that as it may, symptoms as a rule take after a certain pattern in cognitive, behavioral, and physical deterioration. In this way, these stages usually overlap (Check, 1989).

- Stage 1

Stage 1 lasts 2-4 years from the time a patient begins experiencing the symptoms. Symptoms begin with recent memory loss, which start to influence a man's employment performance. An individual experience issues recollecting well-known telephone numbers and experiences difficulty taking care of cash or paying bills. Sometimes, the individual might be bewildered about places, loses initiative and takes much more time with routine tasks. He may touch base at wrong time or places. The individual loses spontaneity. Mood and personality changes start. The individual experiences issues adapting to the circumstance and suffers from anxiety regarding his symptoms and begins avoiding people. The individual has misguided thinking; what's more, decision-making becomes an issue.

- Stage 2

Amid stage 2, memory loss and perplexity keep on increment and the capacity to focus abbreviates. The person begins having issues perceiving close friends or potentially relatives and begins repeating statements and movements and becomes restless. They get anxious, particularly in late afternoon and during the evening. They have perceptual motor issues, with occasional muscle jerks and twitches. The individual experiences issues arranging their thoughts and thinking coherently and can not find the right words; they make up stories to fill in the blanks. The individual becomes suspicious, bad tempered, and restless and experiences loss of impulse control. The individual fears bathing and has trouble dressing. The individual gains and loses weight also, may portray signs of delusion. They require full-time supervision.

- Stage 3

Stage 3 is the terminal stage. The individual can not recognize family and the image of themselves in the reflection of the mirror. They have close to nothing capacity with self-care and lose weight even with a decent diet. At this stage, the individual is incapable of communicating with words and can not control bowel or bladder. The individual may have seizures or experience trouble with gulping. The individual in the end dies of contamination or aspiration pneumonia or other similar conditions.

2.1.6 Development of Cognitive, Behavioral, and Physical Problems

- Cognitive Impairment

Alzheimer's disease is a chronic process with progressive crumbling of cognitive capacity. Essential cognitive issues of AD include memory debilitation, dialect disturbance, and disabled executive function, abstract thinking and visual spatial deficits. As Alzheimer's advances, a decay of intelligent intuition judgment, critical thinking capacity, executive functioning, and planning is expected (Yellowitz, 2005). The perplexity and bewilderment of mid-stage AD makes it progressively hard to keep up ordinary practices. The outcome might be inappropriate behavior in social circumstances or losing all sense of direction in one's own home. The individual with AD can turn into a risk to self or others. There is no doubt that finding answers for cognitive decay connected with Alzheimer's is a focal territory in geriatrics. The range, recurrence, and seriousness of cognitive shortfalls and issue practices connected with AD put family caregivers under physically demanding and unremitting stressors.

Cognitive hindrance makes the most grounded commitment to both the improvement of long haul useful reliance what's more, a decline in function. The presence of psychotic symptoms may advance build this reliance.

- Behavior Problems

Individuals with AD experience the ill effects of a variety of behavioral issues. In the advanced phase of the ailment. People with AD turn out to be increasingly defenseless and dependent. Decrease in logical thinking, judgment, and critical thinking capacity are regular among individuals with AD, especially in the sickness' later stages. As the symptoms of Alzheimer's advance, the individual becomes emotionally fragile (Helpguide.com, 2007) in the beginning, there might be a feeling of anguish and fear that comes with the awareness of having a progressive terminal disease. In the long run, however, the diagnosis of Alzheimer's is overlooked and the capacity to be rational fades. Logical thinking can never again be utilized to alleviate dread and perplexity. As issues with memory and judgment increase, the individual with AD can become a danger to self or others. There is a slow loss of cognitive capacities, which gives rise to odd behavioral issues that regularly drives caregivers to their limits (e.g., placing everything in their mouth, playing with their own faces). Physical disintegration is additionally inescapable with AD progression.

A few behaviors have more of a psychological basis driven by anxiety, distrustfulness, or hallucinations (Alzheimer's Association, 2006). Nervousness in individuals with AD may cause a fear of sitting alone. It is regularly connected with paranoia. It is also, worth noting, that some of these behavioral issues in individuals with advanced stages of AD, particularly agitation, might be brought on by delirium (Morley, 2007). Delirium is an extremely dangerous altered state of consciousness

whose symptoms include confusion, distractibility, disorientation, disordered thinking and memory, illusions and hallucinations, and hyperactivity. Other conduct issues include agitation, irritability, wandering, anxiety, sleep disturbances, aggressiveness, shouting, and improper sexual conduct. Depression is extremely normal among individuals who have AD. It is evaluated that clinically significant depression happens to 20%-40% of individuals with AD (Alzheimer's Association, 2006). As a rule, they become depressed when they realize that their memory and capacity to work is deteriorating. Depressive symptoms in Alzheimer's may go back and forth, as opposed to memory and considering issues that worsen progressively. Individuals with AD experiencing depression may decline to help with their personal care. They may wander far from home more frequently. People with Alzheimer's and depression maybe less likely to talk openly about wanting to kill themselves, and they are less likely to attempt suicide than depressed individuals without dementia. Men and women with Alzheimer's experience depression with equal frequency.

Sleep disturbance associated with AD include expanded recurrence and duration of awakenings, decrease in both dreaming and non-dreaming phases of sleep, and daytime napping (Alzheimer's Association, 2006). Similar changes occur in the sleep of elder individuals who do not have dementia, yet these progressions happen more regularly and have a tendency to be more severe in individuals with AD. Alzheimer's patients may turn around their sleep wake cycle, bringing about daytime tiredness and evening time restlessness—a condition called sun downing. It is common for those with AD to end up progressively agitated as sunshine fades away into night. These sleep disturbances frequently increase as AD advances. Some individuals with Alzheimer's disease sleep a lot of while others experience issues getting enough rest. At the point when individuals with Alzheimer's can not sleep, they may wander amid

the night, not be able to lie still, or shout, disturbing their caregivers. Studies have showed that sleep disturbances are connected with increased impairment of memory and ability to function in individuals with Alzheimer's. There is also evidence that sleep disturbances may be worse and more severe for people with AD.

- Wandering

Wandering is a typical behavior in AD and is normally an attempt to communicate after dialect skills have been lost (Check, 1989). Wandering made the illness critical to the field of search and rescue, since individuals with AD not just wander—they likewise effortlessly get lost. AD can eradicate a person's memory of once-commonplace environment and make adjustment to new environment very troublesome. Thus, individuals with Alzheimer's sometimes wander far from their homes or caregivers. Also, turn up—startled and muddled—a long way from where they home. Wandering is additionally connected with too much stimulation, for example, multiple conversations in the background; even the commotion of pots and skillets in the kitchen can trigger Wandering. Since mind processes lessen as a consequence of Alzheimer's disease, the individual may get to be overwhelmed by every one of the sounds and begin pacing or attempting to escape.

Normal adults rely upon three intact systems to know where they are in space (Nadelson, 1999): (1) shorthand long-term memory to identify landmarks; (2) a sense of time and speed to judge distance; and (3) an intact visual-spatial sense to know direction angles and expected arrival times between landmarks. All three of these systems are impaired in people with AD. A person with Alzheimer's is disorientated and not able to judge conceivably dangerous spots and circumstances (Gogia & Rastogi, 2009). Consequently, individuals with AD who tend to wander are said to

be critically wandering. Critical Wandering is viewed as hazardous to AD people on the grounds that they will not shout for help or react and respond to other people's shouts; they will not have many physical clues; they may endeavor to go to a previous home or wander to their most loved area, which can be far away, and further increase their chances of getting lost or getting into a dangerous circumstance; and they may have a past history of wandering.

Individuals experiencing severe Alzheimer's have a higher rate of critical wandering and are at more danger and risk of doing so. Wandering is among the most unsettling and even startling behaviors shown by individuals with Alzheimer's. Wandering among people with AD may increase if the caregivers are young, less educated, overburdened, or depressed (Yellowitz, 2005). Despite the best preventive attempts, particularly in the home environment, basic wandering may still occur. Wandering might be related with:

▪ Medication side effects

▪ Memory loss and bewilderment

▪ Attempts to express feelings, for example, fear, disconnection, forlornness or loss.

▪ Curiosity

▪ Restlessness or boredom

▪ Stimuli that trigger recollections or routines, for example, seeing coats and boots beside an entryway, a flag that it's an ideal opportunity to go outside (Nadelson, 1999).

- Physical Impairment and Personal Care

As well as turning out to be progressively cognitively impaired, a person with AD becomes progressively physically impaired. Patients step by step lose the capacity to

watch over them and in the long run turn out to be completely reliant upon others (Morley, 2007). Access to the bubble-like world to which they withdraw themselves becomes more troublesome as dialect break down. They lose their memory, and walking up and down. Individuals are additionally less ready to build up and keep up eye contact and appear to see through individuals. They no longer perceive themselves in the mirror and don't seem to know their nearest relatives. Patients will progressively become less interested by individual cleanliness. They will overlook how to brush their hair, clean their teeth, and change garments. Frequently individuals become progressively unbending toward the end of their life. Their face becomes dull and unbending, the jaws clenched, and the body hardens. This can prompt to troubles with eating and falling. Day by day exercises for people with AD tend to change as the illness advances. AD tends to limit concentration and cause troubles in following directions. These elements can transform basic exercises into every day challenges. Day by day functioning of the patient is regularly influenced on the grounds that AD is characterized by a relentless loss of intellectual and social capacities.

- Activities of Daily Living

As AD advances day-by-day exercises become harder to oversee. Every patient has high points and low points, and some may discover basic undertakings confounding or testing while others may not. The greater part of the general population in the advanced phase of AD require help with such fundamental exercises as utilizing the latrine, getting in and out of bed, walking, eating, washing and dressing. Since washing, prepping and dressing are normally private exercises, the individual may decline assistance.

- Bathing

A few people with AD would not mind bathing, however others may observe it to be a terrifying confounding experience. In the event that the individual is confused, utilizing the restroom can be testing, as the individual may see washing as repulsive, undermining, or difficult. The patient may act in troublesome ways, shouting, opposing, and hitting his guardian (Gogia & Rastogi, 2009). This conduct happens in light of the fact that the individual does not recall what showering is for or does not have the persistence to endure the lack of modesty or the cold. Dealing with individual cleanliness is regularly more troublesome for relatives than for professional caregiver as the patient may feel humiliated on the off chance that 'outsiders' are washing him.

- Dressing

For somebody who has AD, the basic demonstration of putting items of clothes on can be frustrating. There are numerous reasons why the individual with AD may have issues dressing, including absence of security, issues picking what to wear, not knowing how to dress and strip, getting just some garments off and different garments on, and battling with catches and zippers (Gogia & Rastogi, 2009). Too many choices of clothing may be confusing for the individual. Different elements may likewise add to the issue, for example, balance or motor skills difficulties. A person might not have the capacity to perceive her garments, or she might be uninformed of the seasons of the year or not be able to dress rapidly under pressure.

- Toileting

Individuals with AD ordinarily encounter loss of bladder or gut control for some reasons. They may lose their capacity to perceive normal urges letting them know

when to go to the restroom, may overlook where the lavatory is found or what to do when in the restroom, or might be antagonistically influenced by medicinal issue, physical conditions, or natural elements. Other causes incorporate clogging and lack of hydration coming about from malnourishment. Justifiably, in light of the fact that toileting is an exceptionally individual and private matter, help with toileting is upsetting for both the individual with dementia and the caregiver (Alzheimer's Association, 2006).

- Eating

Eating can be a test for individuals with AD. A person may have a poor appetite, loose enthusiasm for sustenance, neglect to eat, or overlook that he has as of now eaten (Reisberg, 2007). He may not perceive when he is hungry, may forget how to utilize a fork and spoon, or may not remember how to bite and swallow. There might be issues with badly fitting dentures or sore gums, which make eating uncomfortable. In the event that both of these conditions is bringing about eating challenges, an interview with a dental practitioner can be very useful. On the off chance that a person is not exceptionally active during the day, they may not feel hungry. In the later phases of AD, individuals may never again have the capacity to comprehend that the food before them is there to be eaten, regardless of the possibility that they are obviously eager. A few people with AD need to eat constantly, while others must be urged to keep up a decent eating routine. In the early phases of dementia, a few people lose enthusiasm for sustenance since they are depressed.

- Mobility and Balance

Alzheimer's disease can influence physical coordination and mobility, prompting to a slow physical decline (Alzheimer's Association, 2006). Individuals in the last phase

of Alzheimer's require help with their day-by-day needs. They lose the capacity to get in and out of bed; they can not walk without help; and they can not sit up without assistance. Neuromuscular shortcoming is prominent among individuals with AD, bringing about a flimsy walk or trouble keeping balance, which disables exercises of day-to-day life.

- Instrumental Activities of Daily living

Individuals with AD encounter subtle changes in complex Instrumental Activities of Daily Living (IADL), for example, overseeing and managing money, planning meals, shopping for groceries, taking prescriptions, and making telephone calls, much sooner than the disease onsets (Nadelson, 1999). The most noticeable indication of AD is the progressive failure to perform IADL— corresponding to the seriousness of the illness—and the resulting loss of independence. All the related conditions identified with cognitive, behavioral, and physical changes influence a person’s capacity to proceed with IADL as Alzheimer's advances to the middle to late stage.

- Speech and Communication Problems

Oral and composed correspondence is continuously weakened as AD advances. At first, a person experiencing AD may have the capacity to comprehend basic discourse, yet may have inconvenience finding the right words to make a point. Gradually, the individual thinks that its increasingly hard to comprehend complex conversations and illustrations and may forget proverbs. These complexities make it troublesome for a man with AD to effectively take a telephone message, which is regularly a red flag to relatives and the AD sufferer himself that there might be a more genuine medical problem than simply ordinary aging. Further intensifying the

condition is the acknowledgment that it is progressively hard to follow a discussion, which might make the individual feel befuddled and unnerved and disheartened. In the later phases of AD, people can not finish sentences and may regularly change subjects or utilize similar words more than once. People with AD will begin to include par aphasias—different words—to fill in the crevices into a discussion that they (and their relatives) no longer understand. Spelling and composing get to be troublesome. A person with late stage AD will most likely be unable to answer questions, since she does not comprehend what is being requested of her/him, and he/she might be overpowered by theme changes that as a rule occur in ordinary discussions. In the long run, the patient reaches a point where her discourse does not bode well and is generally chattering, for the most part bringing the sufferer to pull back from talking entirely. In the late phases of the disease, the sufferer will not able to impart exceptionally essential necessities to her caregivers. A few patients may illustrate an infrequent automatic verbal reaction, yet deciding what the patient's needs are ultimately falls on the shoulders of the patient's relatives and caregivers.

- Incontinence

Incontinence is a typical condition that can happen at any stage in AD. As the illness advances, individuals experiencing AD lose their capacity to control their toileting, and both bladder and fecal incontinence happens (American Psychiatric Association, 2000). Regularly, an individual first creates long-winded urinary incontinence that gradually advances over a time of years to aggregate loss of bladder control. The fast onset of incontinence proposes a behavioral or medical change. At the point when incontinence happens as a feature of Alzheimer's, it is ordinarily for one of the accompanying reasons:

▪ The patient can not find his way to the bathroom or can no longer clean himself.

▪ The patient does not understand that the bladder or bowels should be discharged—this might be since the right signals are not receive or sent by the mind, or it might be since the sufferer has become ignorant of what the sensations mean.

▪ The patient can not move quick enough to get to the latrine in time.

▪ The patient may not know where the bathroom is. This might be on the grounds that the ways to all the rooms in the house appear to be identical, and the patient can not recall what is behind each. For others, the latrine is no more extended where they anticipate that it will be—in adolescence the toilet may have been on another floor of the house what's more, it might be this toilet they are attempting to find.

▪ The patient may mix up one question for another. To a confused patient, a wastepaper basket may resemble a toilet, and this can bring about heading off to the latrine in the wrong place; it might cause enough postponement to make it inconceivable for the sufferer to reach the real latrine once he does understand his mix-up.

Incontinence is frequently troublesome, stigmatizing, humiliating, upsetting and causes misery both to the individual with Alzheimer's and to the caregiver (Kennard, Silva, & Vitiello, 2006).

2.2 Summary of the Chapter

Alzheimer’s a disease marked by progressive loss of mental capacity resulting from degeneration of the brain cells.” Two main symptoms play a role in the diagnosis of Alzheimer’s disease. The first one is the patient’s Impaired memory, as well as additional “Cognitive Disturbances.”

In most cases, patients of Alzheimer’s will cease to be able to function without assistance, families of the patients admit them to a residential-care facility. As the illness advances, patients barely communicate anymore. They do not converse with others and do not answer questions, they may not even be aware of another person being with them in the room. And they are unable to leave their beds at all times.

Alzheimer patients grow cognitive, physical and behavioral problems. Essential cognitive issues of AD include memory debilitation, dialect disturbance, and disabled executive function, abstract thinking and visual spatial deficits. In the advanced phase of the ailment, people with AD turn out to be increasingly defenseless and dependent. Decrease in logical thinking, judgment, and critical thinking capacity are regular among individuals with AD, especially in the sickness' later stages. They show symptoms of emotional fragility, rational capability loss, issues of judgment and memory, loss of cognitive capacity, hallucinations and anxiety distressfulness. Delirium is an extremely dangerous altered state of consciousness whose symptoms include confusion, distractibility, disorientation, disordered thinking and memory, illusions and hallucinations, and hyperactivity. Other conduct issues include agitation, irritability, wandering, anxiety, sleep disturbances, aggressiveness, shouting, and improper sexual conduct. Depression and sleep disturbance grows as well.

Summing up the symptoms of AD shows that patients with reduced physical abilities become more vulnerable to their daily life activities. Simple daily routine can become a great challenge for them. For such reasons, in order to provide AD patients with better quality living conditions, it becomes necessary to design in line with relevant design guidelines as much as possible.

Chapter 3

UNIVERSAL DESIGN GUIDELINES FOR ALZHEIMER'S DISEASE IN SENIOR CARE CENTER

3.1 Introduction

According to the studies on the relationship between human and the built environment, design principles regulate the way that spaces are designed, in different circumstances. In case of AD patients, design principles are specified in manuscripts and guide lines according to the America, Canada and Australia standards that are universally applicable for creating safe and efficient spaces for the seniors who suffer from Dementia and Alzheimer's. Therefore, after investigating among the causes and symptoms of Alzheimer's disease, design guide lines prepared accordingly will be looked at as a useful tool, applicable for designing built environments suitable for AD patients in senior care centers.

3.2 Households

Having Alzheimer's can be too much, so it is natural that patients of the disease may feel overwhelmed, confounded as well as distracted when confronted with huge gatherings or vast areas and places. This is also implied in action cooperation, dinner, as well as private life styles. Inhabitants can frequently work more productively in calmer, littler gatherings. As well as, the small scale assortments can help resident centered personal and care connection between the residents-- a significant factor because support can improve a person's health. The family model is an important

model for nurses when it comes to assisted living situations; in that case, the model is centered on an individual focused approach. Family units ordinarily incorporate eight to twelve private rooms with a minimum of 12 square meter available floor-space, classified with 15.71 square. meter clear area, single bedrooms shall be at least 80% of total resident's bedrooms with consideration of the living/feasting/and kitchen territory, in addition to extra rooms for storage as well as supporting staff. Whenever standalone, the facility is named a "small house." Frequently, a few little houses are gathered together to better share spaces and make the staff more efficient. (Emily Chmielewski, 2014)

Recommendations:

I. Elderly house should not be located in an industrial area and making little gatherings where people and households are only ten to fourteen inhabitants are recommended (Alzheimer's Australia, 2004).

II. Besides rooms, families ought to give a mutual, common kitchen, dining area, and lounge room, in addition to safe open air space. Extra territories for occupants inside the family unit may incorporate (however are not restricted to) a spa/showering room, little sanctum as well as movement space as it has been shown in Figure 1 (Emily Chmielewski, 2014).

Figure 1: Example for House Hold Containing a Small Activity/Meeting Room. A Common Living/Dining Room, 14 Bedrooms, Screened Porch and Kitchen (Emily Chmielewski, 2014).

III. Inside the family unit, give little gathering areas that offer visual as well as acoustic security.

IV. Maintain a strategic distance from multi-reason rooms. Despite the fact that the general idea of adaptability is essential, some patients may not be acquainted with the changes after getting used to a certain space. Rather, give little gathering areas, which look in particular, like the normal home. There ought to be assigned areas of interests, for example, easygoing discussion, feasting, cooking, and observing TV (Spangenberg,1999).

3.3 Residential Qualities

These homes should not feel like facilities. The privacy of those buildings is exceptionally essential, all around. A lot of things can have a major impact, such as the mass of the buildings, the interior design, the materials and decorations, and alarm systems or even the names that are given to the rooms. (Emily Chmielewski, 2014).

Recommendations:

I. The outside mass ought to be verbalized (with particular components and dividers that run to make distinctive planes) and in a way that and size that identifies people. And the materials should be suitable to the location and society of the building's area as it has been shown in Figure 2.

II. Components that make an inside domain ought to be joined, including: giving differing qualities, delicate instead of hard surfaces; and points of interest (e.g., work of art and adornments, window medicines).

Figure 2: The Example of Health Care Center Related to The Exterior Residential Scale and Massing Materials and Architectural Design (URL1).

III. Inside format and pecking orders of space and flow ought to reflect customary private formats. For example, in cutting edge Western societies, this format for the most part comprises of an open to-private move of section anteroom to lounge room to lounge area and kitchen, and the rooms should be very secluded. Furthermore, Western-style homes infrequently utilize passages. Rooms are organized enfilade, which implies strolling through rooms as opposed to corridors to get to a place. Little foyers are generally just offered as an approach to get to secure territories, for example, rooms or back of-house spaces. (Take note of that while making little family groups, this sort of design is achievable.) By repeating average home formats, the building outline can help inhabitants feel great, protected, less disappointed, and decrease testing practices (McAllister, 1999).

IV. As a patient with Alzheimer's disease' condition evolves, frequent incontinence occasions are probably going to occur (Cohen, 1993). Likewise, the ground ought to

be anything but difficult to mop and keep up, while as yet advancing portability and a genial appearance and surface. Accessible alternatives to accomplish these objectives have enhanced significantly in the course of recent years as it has been shown in Figure 3.

Figure 3: Flexibility of Interior Furniture, Residential Style, Durable Material (Cohen, 1993).

V. Decorations in common areas ought to take into account adaptability. For example, instead of giving one huge table, consider a few small tables that you can pull them apart or set them together depending on what is needed of them and furnishing in general area should be homelike in character with good quality and adequate range of activities and interests as it has been shown in Figure 4 (Emily Chmielewski, 2014).

Figure 4: Lockable Cabinets For Storing Cooking Stuff and Some Medications (Emily Chmielewski, 2014).

VI. There ought to be glare-free common lighting with high illumination for aging eyes, private globules, non-reflecting furnishing, emergency lighting, using trees and shading elements for controlling daylight, using drop-off exits in entrance for higher gravity, different lighting variety in living area and lights on the tables and floor and lower part for whom used wheelchair or walker and upper part. The glare-free lights will help make the place feel more like a home and lessen the chances of a patient injuring himself or herself because they will not think there is some water on the floor or a hole as it has been shown in Figure 5.

Figure 5: Using Glare-Free Lighting (McAllister, 1999).

VII. The building façade should be designed by standards for location, climate and building habitation cooling for dietary and kitchen 22^{o}C and 26^{o}C, for staff areas and administration office 22^{o}C and 24^{o}C and for residents 24^{o}C and 26^{o}C occupied temperature heating (Alzheimer's Australia, 2004).

VIII. To advance personalization of the occupants' rooms, offer an impartial color palette (a "clear canvas"). Likewise, think about giving a plate rack or something else when it comes to ecological signals to design the space (Figure 6). Operational hardware ought to be out of sight and all the hardware should be set in places that are suitable for it (Cutler, 2006).

Figure 6: Personalization of Resident's Bedroom (Cutler, 2006).

3.4 Way-Finding and Orientation

Way finding is comprised of three main elements: the knowledge of where the person is located. How to get from that place to other places, and the knowledge of when the arrival took place (easily accessible, visible, user friendly). The way finding framework is the vital part of occupant and guest comfort, for the patients, encountering balance or walking problems, confronting a differentiation in visual sharpness and profundity observation and for individuals with Alzheimer's that have trouble changing in accordance with a new environment than individuals without subjective misfortune, it is especially imperative to have the capacity to discover one's way around as easily as could be expected under the circumstances. In the event that occupants feel safe and know their way around the area they're living in, then they're more likely to be more active and friendly with other people (Passini, 2000).

Recommendations:

I. Areas ought to be unmistakable, in the way they look and general design. Rehashing or reflecting floors could confuse some people, since they may see family units similarly. Inhabitants could think that they are in the correct room, but they would be off-base family unit wing (Verbeek, Kane, van Rossum, & Hamers, 2011). Getting lost is in some cases due to mixing up which family unit to go to, instead of which space to go to. The building format ought to minimize way-finding decisions to decrease disarray as well as confusion as it has been shown in Figure 7.

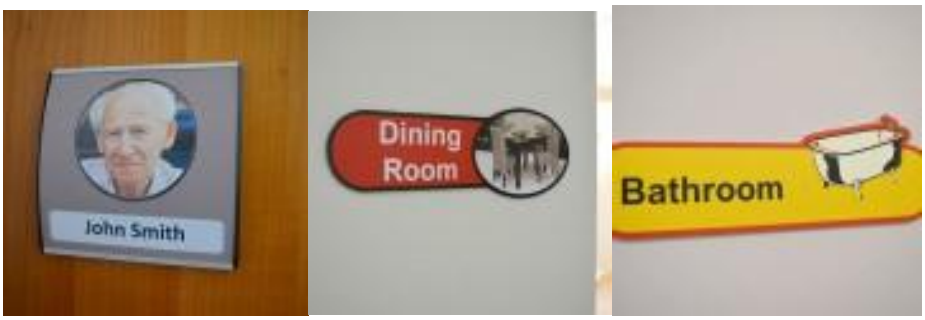

Figure 7: Defining Spaces by Name, Numbers Together With Related Photo (Verbeek, Kane, van Rossum, & Hamers, 2011)

II. At every basic decision-making point, for example, corridor intersections, there ought to be orienting points of interest to assist with finding the way. Because particular signs are more critical than unpretentious changes. Landmarks ought to be one of a kind and varied, for example, unmistakable objects, fine art, or a view to a particular open-air highlight (Marquardt, , 2009). as it has been shown in Figure 8.

Figure 8: Convert Distinctive Element in Each Decision Making Point (Marquardt, 2009).

III. Take into account personalization at room passages, since occupants react more to customized points of interest than non-specific ones (Verbeek, Kane, van Rossum, & Hamers, 2011).

IV. Take into account personalization as well as providing unmistakable landmarks at doors to each family group as it has been shown in Figure 9. Giving these cues at family doors could help with finding the way just as the box of memories would. Especially when the design of the building is repeated(Marquardt, , 2009).

V. Give arranging views through spaces and between goals. So, patients living in the facility can know in what area they are in and could choose to participate in an activity that is going on around them when they see what is happening.

Figure 9: Locate Personal Photo and Memory Boxes Outside Each Bedrooms For Helping Way Finding (Marquardt, , 2009).

VI. Distinguish places and areas by using a numeric and naming system as well as other kinds of signals. Research has shown that patients regularly hold acknowledgment of names and numbers than any other kind of memory (Rogers, 1990).

VII. Because Alzheimer's sickness advances contrastingly in some people, and a few people could lose their capacity to peruse or grasp words prior on, combine photographs to tell about objects and areas. Or maybe, give visual prompts to essential exercises.

VIII. In order to control entry to areas, utilize Dutch entryways (an entryway partitioned on a level plane which can open half of it while the other remains closed) and should be color-coded, curtains on the inside or potentially outside windows, and diminishes lighting to deflect inhabitant section. The doors should be wide enough to access for users with wheelchair.

IX. Offer perspectives to the outside. These places not just act as areas of interred, yet can likewise offer fleeting introduction, from knowing what time it is, to changes in the seasons (Joost van & Kort, 2010). Open-air perspectives can likewise advance utilization of outside spaces and strolling; and common light makes a difference manage circadian rhythms, assisting with sleeping disorders, sun downing, and seasonal depression with maximum 150 mm dimension (Alzheimer's Australia, 2004).

3.5 Independence, Control, and Flexible Rhythms

Cultural contrasts, individual inclinations can happen in many individuals or suffering from Alzheimer’s or not—esteem self-sufficiency and need to experience in a specific manner, at their chosen speed. A non-institutional program in view of little, casual gatherings and adaptable calendars can permit this. Patients can choose how much they sleep and when to eat or participate in events (Femia, Zarif, & Johansson, 1997).

Recommendations:

I. There should be food available in the fridge that can be accessed at any given time. A microwave or any means of heating food available could also help and encourage more variety in eating choices.

II. The environment ought to offer tactile signs to urge inhabitants to consume food, from being able to see the kitchen to noticing nourishment getting prepared. Having patients participate in preparing supper and cooking can also help (Fitzsimmons & Buettner, 2003)

III. Important places and areas that are used regularly should be situated in a way that promotes usage as well as diminishes dissatisfaction and because patients have trouble remembering things, it is helpful if they had signals to remind them of those areas as it has been shown in Figure 10.

Figure 10: Using Glass-Fronted Cabinets Can Help Residents to Easily See What is Inside (Fitzsimmons & Buettner, 2003).

IIII. Separate inhabitants' rooms from movement regions or other boisterous spaces so individuals can rest without disturbance.

V. Inhabitants' rooms ought to incorporate a storeroom/closet with two sections: One of them gives restricted access to only a day garments, and underpants and underwear for stay unmistakable. And other section stores extra garments and has a lock and key when needed. For patients whom need constant reminders that their belongings are still there, that are when the locked part plays a key role. Also there should be closets with hangers on them for patients to change their clothes and hang them in the proper areas (Namazi & Johnson, 1992).

3.6 Safety and Security

Two parts to wellbeing and security exist: actual and perceived. In addition to the fact that it is essential for inhabitants to be protected, they should also feel like they are. That could be difficult since Alzheimer's sickness frequently creates nerves and paranoia (Qizilbash, 2003), which in turn influences somebody's wellbeing and prosperity, feeling of home and comfort level, capacity to focus, participate in exercises, and so forth.

Recommendations:

I. Workers should be able to watch over the patients whether they’re inside or outside. A good way to do so is either windows or openings between areas for people to see through them as it has been shown in Figure 11.

Figure 11: Provide Open Layout Spaces in Outside and Inside (Qizilbash, 2003).

II. All the fixtures should have a way to manipulate the water temperature to avoid patients burning themselves.

III. Despite the fact that occupants ought to have unlimited access to their belongings, things like cleaning items, meds, sensitive equipment and certain utensils ought to be put away securely away for the occupants' assurance. In like manner, give lockable drawers, cupboards, and other stockpiling spaces all through the building. Satisfactory capacity all through the family unit will likewise lessen mess, advancing a quiet situation and decreasing fall dangers (Emily Chmielewski, 2014).

IV. In some cases inhabitants should be confined from a certain space because of security. In such conditions, an entryway or sliding entryway can briefly limit that zone as it has been shown in Figure 12.

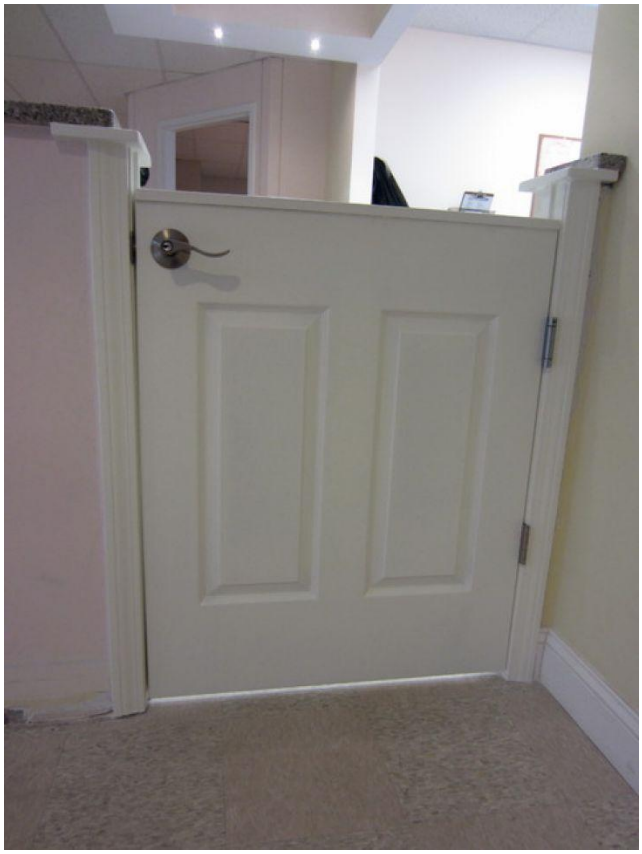

Figure 12: Apply Sliding Door or Gate for Blocking Off the Spaces
(Cohen & Day, 1993).

V. Not with standing the slip-safe and non-reflecting floors that are commonplace of patients' living situations, abstain from differentiating light and dim territories on ground. Thus, lights should not create shadows or areas of bright light. These sorts of varieties might be perceived as a gap. The apparent differences inside and out may cause an occupant to attempt to jump over or walk around an evident obstruction, and that might bring about a fall. It could also hinder circulation in the event that somebody fears crossing an apparent obstruction. Likewise, materials what's more, divider covers for example, ought to have plans that are effortlessly unmistakable and are most certainly not seen as abstract items, appearances or creatures, which can be confusing for individuals with cognitive impairment.

3.7 Entries and Egress

Despite the fact that occupants with Alzheimer's illness regularly do not exit the facility or in some cases not even the zone they are in, many individuals want to walk around or feel like they should be somewhere, prompting to anger or trying to escape. What is more, seeing individuals move around freely, and not being able to do the same, may bring about dissatisfaction or uneasiness (Cohen & Day, 1993). Appropriately, passageways and exits require unique thought—from giving a suitable level of wellbeing/security to making a difference to counteract worries.

Recommendations:

I. Passages for workers and guests, but inaccessible for occupants.

II. Disguise departure points, to decrease anxiety and the possibility of escape. Doorways should be situated in faintly lit nooks, hindering inhabitant to get to them. Entryways ought to be off-pivot as it has been shown in Figure 13.

III. Secure crisis leave entryways with an electric deadbolt that discharge if there should arise an occurrence of a fire, permitting occupants to leave to a secure garden or region.

Figure 13: Insert Off-Axis Exit Doors **(Emily Chmielewski, 2014)**.

IV. Utilize innovation, similar to individual GPS following frameworks with quiet cautions, to inconspicuously supply workers with data about inhabitants' locations or inform workers when an inhabitant needs help fining their way (Bowlby Sifton, 2007).

V. Windows should only open to six inches (Figure 14) and bedroom doorway should provide at least clear width of 122 mm

VI. Give other means of security in the case of an inhabitant moving beyond the primary layer of security, they would still be in protection.

Figure 14: Windows Opening Inside the Bedrooms (Bowlby Sifton, 2007).

3.8 Spa and Bathing

Despite the fact that numerous outline rules exist for creating friendly bathrooms for seniors, there are a few particular proposals for a populace with psychological impedance. For somebody with Alzheimer's, the toileting and additionally washing environment can possibly be upsetting or overpowering, and can be unpredictable for caregivers to ideally oversee. From averting falls and incontinence issues to safeguarding pride what's more, mollify fears, spa/showering spaces require extraordinary thought.

Recommendations:

I. Every single bedroom shall have clear area of 4.76 m^2 and for double bedrooms 6.14 m^2 (Alzheimer's Australia, 2004). Meters, incorporate a connected private lavatory that comes with its own shower with enough room for someone of the workers to help the patient with supporting grab rails and hardware, e.g. These kinds

of private bathrooms feel more like home and less like an institute. Residential bathroom should be next to living room, dining area and outdoor entertainment space in close vicinity to the areas with maximum privacy.

II. Have a direct line of sight from the patient's bed to the bathroom to decrease chances of incontinence (Namazi & Johnson, 1991).

III. Washing areas should be safe features, quiet and tranquil as could be expected under the circumstances to ease nervousness, many patients fear showers and water (Murna & Barbara, 2014) as it has been shown in Figure 15 - 16.

Figure 15: Resident's Bedroom Should Provide Bathroom (Murna & Barbara, 2014).

Figure 16: Non Characteristics Bathroom (Murna & Barbara, 2014).

IV. Give cabinet(s) that comes with a lock or potentially drawer(s) for toiletries and different things that occupants shouldn’t have access to

V. Since symptoms of Alzheimer's may incite a patient to collect, an inhabitant may attempt to conceal things in improbable places. For this, all the items in the bathroom should be screwed and hard to expel. But at the same time, toilets should not be too hard to unclog because some occupants may throw some things down the toilet (Lyketsos & Olin, 2002).

VI. Consider introducing screen entryways, which can be shut if needed. Instead of mirrors. This element is imperative since a few patients try not to perceive their own reflection in the mirror because it annoys them (Coltheart, 2010).

3.9 Secure Outdoors Spaces

Giving unhindered entry to safe open air areas— even for patients who try to escape — is fundamental because it will lessen tumult and disappointment, soothe anxieties, and enhance physical wellness by offering inhabitants a safe area to be on the outside. It may even decrease escape endeavors; because occupants don't feel locked up. While wellbeing and safety are dependably a worry and should be thought about, the outside area ought to be planned so that workers and the patients' relatives are all right with patients being outside unsupervised, when fitting. a few things can make the open-air area more secure, more agreeable, and significantly all the more welcoming—giving occupants the flexibility, human scale for physically and cognitively impaired, with limited direction to pass distraction , freedom and self-sufficiency that individuals desire (Robb, 2001).

Recommendations:

I. Give occupants unlimited entry to a safe open-air area, if suitable as it has been shown in Figure 17. Put dining area next to outdoor sitting area. Outdoor spaces for residents should be required, wheelchair accessible walkways with provided handrails for all ramps, stairs and applied to help residents on outdoor walkways.

Figure 17: Accessibility to Outdoors Use Easy Outdoor and Indoor Connections (Robb, 2001).

II. Consider utilizing small blinds or different covers on windows and glass ways to view the area where patients walk so notice any bad climate (like when it is too warm or icy).

III. Windows to the outside are necessary so workers can watch over patients that are outside (Phinney & Chaudhury, 2007).

Figure 18: Outdoor View From Inside to Outside for Encourage Patients U**se**
(Phinney & Chaudhury, 2007)

IV. Find open-air zones in tranquil places that help not to agitate patients or cause them anxiety because of the noise (Anna, Annika, Stefan, & Louise, 2011) as it has been shown in Figure 18.

V. Secure open-air zones with border fences that are higher than what patients could climb and make them hidden from plain sight with landscape configuration components, for example, trees or bushes so it does not pull in occupants' consideration or feel like prison. Furthermore, the furniture in the open zone shouldn’t allow usage for escape or climbing

VI. Develop routes for walking that circle back to the building and pathway should be wide enough to insert a wheelchair. Walkability in outdoors should be loop with maximum 500 meters in whole length (Alzheimer's Australia, 2004) as it has been shown in Figure 19.

VII. On the off chance that there is an administration door, a strong pathway ought not connect the door and the garden's course circle.

Figure 19: Walking Loop in Garden Should Back to Entrance of Building (Alzheimer's Australia, 2004).

VIII. Give way and border lighting on the off chance that somebody leaves the building during the evening — both for checking occupants and also so individuals can satisfactorily observe the ways and the way they go back to the building. Used hard material for the walkway steady with providing umbrella tables, Arbours, shaded swing and trellises, cyclist traffic and pedestrian must be separated from vehicle traffic.

IX. Guarantee that all plants are not toxic or sharp so patients do not accidentally harm themselves (Zeisel, 1994). as it has been shown in Figure 20.

Figure 20: Plants in Senior Care Center (Zeisel, 1994).

3.10 Active Engagement of Alzheimer's Patients

Individuals of any age and capacities require important engagement. Intentional exercises and having the capacity to work on whatever skills they still have can advance sentiments of feeling worthy and decrease sadness and worry. Individuals with Alzheimer's, be that as it may, may require signs to start action. They additionally should be shielded from diversions that could upset engagement or that may get to be distressing. The main goals is to simulate the patients without stressing them by giving them environments that foster their remaining abilities (Keith, Lyn, & Gerald D, 2006).

Recommendations:

I. To minimize overstimulation or diversions, control noise and give choices to different group sizes, including smaller gatherings for inhabitants who require a quieter environment.

II. Offer an arrangement of assigned movement areas, which can be used for various, groups and supports the patients' activities and interests.

III. Activity zones ought to be commonplace, taking advantage of inhabitants' long-term memory. Areas ought to foster exercises that feel like life is going on, for example, the previous housewife who needs to fold clothing or the resigned office laborer who needs to finish "paperwork."

IV. Exercises and other programs ought to be simple to discover and get to. On the off chance that an inhabitant can discover things without opening pantries or experiencing a part of entryways or spaces, the individual will be more slanted to take an interest in or start a movement.

V. Occupants ought to have the capacity to see exercises before participating. This may move somebody to participate in the activity or permit the occupant to latently take an interest by observing from close-by (known as "sideline" participation).

VI. The kitchen should have views to outdoor and accessible for residents. Dining area's design should have large tables with flexible spaces and incorporate for 25 to 30 residents with most view of residents by assistants and should be able patients can plan dinners and join preparing the food and interact with the workers and sitting, social interaction and visiting with friends, family and caregivers as it has been shown in Figure 21 and Figure 22.

Figure 21: Observing Activities Before Joining (Keith, Lyn, & Gerald D, 2006).

Figure 22: Residents Should be Able to Communicate From Kitchen Table with Care Givers and Joining in Kitchen Activities (Keith, Lyn, & Gerald D, 2006).

3.11 Quiet and Private Indoor and Outdoor Spaces

Similarly, since it is imperative on patients for having zones that help their activities, actions, It is important for them to have quiet areas. Taking into account centered and suitable incitement.

Recommendations:

I. Give every person their own bedroom for them to be independent in and store their assets, this is good for inhabitants to feel safe and have their own territory.

II. Find secluded rooms in a private area, far away from commotion. Using suitable acoustics to well being, insulating materials, isolate acoustically residents from corridors and rooms from each other. Mechanical and electrical generating material should be away from residents.

III. Guarantee that the format of secluded rooms and bathrooms diminishes prominent visual perception since patients may act indecently (e.g., stripping or utilizing the latrine without shutting an entryway).

IIII. Utilize Dutch doors, which permit staff and occupants to investigate private rooms for observing and introduction. In spite of the fact that individuals can see into the rooms, Dutch entryways keep up occupants' feeling of protection. Since sight can keep patients from going to areas to say what lies after a closed entryway, at the point when the lower part of the Dutch entry is shut, it can restrain patients’ entry to people’s rooms (Alzheimer's Australia, 2004).

V. Consider supplying a “controlled multisensory environment” for treatment or other actions. For case, a Snoezelen® (FlagHouse, 2014)room commonly comprises of: things to stimulate the patients’ sight; an assortment of carpets, pillows and surfaces that empower the touching system; diverse sounds (e.g., unwinding music) and scents (e.g., fragrant healing); delicate decorations and wall cushioning; and treatment props. Snoezelen® rooms have been appeared to lessen disturbance, meandering and other manifestations of patients (Brian, 2013).

3.12 Engaged Wandering

Strolling is a common conduct in individuals with Alzheimer's. Some of the time this activity gets to be purposeless meandering, where a man is in inquiry of a goal or question that might be vague or obscure. Whenever wandering as well as scavenging reflects an individual's longing for mobility, independence and additionally activity, these practices ought to be upheld — not disheartened. Be that as it may, it is essential to divert these practices into safe, connecting with meaningful exercises. In this way, the setting can be utilized to help organize individuals or divert walking around aimlessly. The objective is to give open doors for active walking, not good for nothing strolling (Cynthia, 2000).

Recommendations:

I. Give various walking paths; as well as a few crossing circles are desirable over a single one. Incorporate arranged lengths and areas, not just to give enthusiasm through assortment, additionally to offer choices for individuals with differing physical and additionally intellectual capacities.

II. Elevate access to "safe" regions (counting the outside), while diverting individuals far from "hazardous" territories, since occupants may wander or attempt to investigate all zones of the household.

III. Try not to end course routes in closed spaces. Circling ways as well as finish goals can divert or connect with an inhabitant. In like manner, don't end lobbies with egress doors.

IV. Strolling loops ought to offer more than only an unhampered, circumlocutory way for inhabitants to take after. There ought to be open doors for important engagement along the way. The circle should go alongside or through assigned movement zones. For instance, occupants should have the capacity to stumble upon—and maybe participate in—a program in the main hall or go to the kitchen and snatch a nibble (Anderzhon & Fraley, 2007).

V. Give seats and different spots to occupants to associate along the circle, since "social walking" also, "front porch" mingling is regular along walking routes (SeniorCare, 1995).

VI. Toilets ought to be effectively observed and ready to be much of the time got to along the strolling circle, for accommodation and in addition to give visual availability that may diminish the possibility of incontinence (Namazi & Johnson, 1991).

VII. Occupants ought to have the capacity to be (subtly) observed along the strolling circle. Proficient workers and relatives state that they enjoy seeing patients and their whereabouts without the need for everybody being in the same place (Fausset, 2011).

3.13 Supporting Family Involvement

Having support from people is crucial for any person's wellbeing (Cohen & Wills, 1985), whether they have Alzheimer's or not. So for patients receiving visits from relatives and loved ones is key in improving their mental and bodily strength. The facility can also be intended to reinforce the neighborhood becoming an asset for the community.

Recommendations:

I. It is important for groups to have their own secluded areas so they can invest energy with other people away from their rooms. These areas can be utilized for family meetings, occasional festivities and workers' gatherings (Butcher, 2001), as it has been shown in Figure 23.

Figure 23: Provide a Quiet and Smaller Room for Visiting Family, Activity With Flexible Furniture (Butcher, 2001).

II. Take seating into consideration in every inhabitant's room. In expansion to a seat near the bed, consider a window situated chair, that can be used for more storing room.

III. Think about including as a pull-up sofa in the nook. This, alongside having their own lavatory, can give relatives that are on a visit a way to sleepover.

IIII. Think about approaches to connect with seeing relatives also, inhabitants together. For example, incorporate a few additional seating spaces in the lounge area so relatives can participate in dinners or activities.

V. Arrange for how the feasting and living regions can oblige various guests as families and companions join occupants to praise uncommon events, for example, an occasional supper.

VI. The building could be used for the community, for example having a library as well as a clinic that can be accessed by the public. Or areas that can accommodate support groups or workshops.

3.14 Supporting Professional Caregiver Involvement

The Professional Caregiver Association has developed policies for the way life changes. So, the responsibilities of the job have changed, for example, The Universal Worker (whom is a proficient caregiver that is broadly educated to help patients in a variety of ways like cooking and cleaning) who can follow up on both they see and what the patient needs (Emily, 2012).

Recommendations:

I. Arrange units to advance workers interchanges and help. Household associations get to be vital especially as occupant's age set, as well as occupants' mental capacities decline. As the psychological and physical capacities of inhabitants continuously decay, the expert worker's obligations grow bigger. Faculties might discover it cost-restrictive to employ more employees, so distance, and correspondence and help become significantly more imperative.

II. Incorporate the workers' stations with the unit — not away from plain view or within an assigned (institutional) workers' station as it has been shown in Figure 24. Consider giving a normal looking desk or sufficient areas and tools (e.g., data ports) near the counters in the kitchen. Note, be that as it may, that the workstation's papers,

gear, and so forth ought to have the capacity to be put away, since a few patients get a kick out of the chance to scavenge or dismantle things. A drawer with a lock or file organizer can ensure, for case, a portable PC and private printed material, as required.

Figure 24: Integrated Living Space and Assistants Workstation (Emily Chmielewski, 2014).

III. Find the staff workstation along the primary flow way so that expert parental figures can all the more effortlessly collaborate with and screen inhabitants and take an interest in regular exercises and for each unit appropriate full time staff and one or more care staff needed for each three residents in every unit with no more than three years skill in caring for Alzheimer's patients.

IIII. The staff workstation ought to incorporate areas for gatherings and doorways to service area should cover for decrease the attachment of residents and doors must not

apply by residents and should be color coded to mix in with wall colors. Inhabitants will be attracted to workers and could even want to do "paperwork" close by the expert caregiver

V. Incorporate a framework for keeping records electronically so that proficient staff can do such errands as event and unit based arrangements while still being effectively connected with occupants. This permits more exposure with occupants and decrease the amount of time the staff spend behind a work area (or holing up behind a medical caretakers' station).

VI. Find equipment that expert caregivers routinely utilize close within reach to decrease trips far from the patients. Strategically situated and cupboards with locks, and so forth permit staff to rapidly and effortlessly get to hardware, supplies and pharmaceuticals.

VII. Consider the area of workers. While face-to-face care exercises happen in the unit, there still should be a secluded room for work as well as a distant area for expert caregivers, and other workers. This area can be utilized for gatherings or telephone calls, community work, keeping records amongst other things. This area ought to be strategically situated for simple access by workers with a specific end goal to decrease time far from the occupants (Schulz, 2004). as it has been shown in Figure 25.

Figure 25: Provide Lockable Cabinet for Nursing (Schulz, 2004).

VIII. Manager should have minimum two years' experience in elderly house in care setting file and update his/her skill, knowledge and competence.

3.15 Summary of the Chapter

According to the design guidelines for AD patients there are universal regulations and principles for creating proper indoor and outdoor spaces. These guidelines make suggestions for design in different situations and spaces for various purposes all related with AD patients.

Based on the disorders in different stages of the disease, which are named as behavioral, physical and cognitive problems; design guidelines give recommendations for designing efficient spaces. The criteria assigned to the guidelines include: Household, Residential qualities, Way finding and orientation, Independence control and flexible rhythm, Safety/security, Entry and egress,

Spa/bathing, Secure outdoor spaces, Active engagement, Private quiet spaces, engaged wandering, Supporting family involvement and Professional caregiver involvement.

Recommendations in each criteria can be integrated in order to control and improve the quality of life and care in terms of both patients' categories of disorders, and care giving staff and facilities.

In this chapter design criteria for senior care centers is divided into two sections: physical factors and social factors as it is shown in Figure 26. The first criteria include two sections. The first section is general building layout, which indicates exterior massing of the building and the location of it. The second section is building layout and spaces, which indicates spatial organization in terms of interior spaces, interior elements, and household comfort (Table 1).

Moreover, social factors include three sections: safety and security, requirements for staff and manager, residents and family interaction (Table 2). Therefore, according to the definitions and descriptions of each criteria, the details of sections are described and understood in order to be used in the analysis of the case study.

One of the most significant achievement of this thesis is about compiling universal design guidelines and principles, which has to be considered for the senior care centers to boost up the quality of life for people suffering from dementia, to have a classified in figure 26 of related factors and criteria within indoor and outdoor spaces and use these factor for analyze the two successful precedents in world and case

study. In figure 26 the characteristics are assorted in two main groups: physical and social.

Physical factors are divided into two major subsets named as general building layout and building layout and spaces (Table 1). General building layout, represent attributes related to the exterior mass of the building and building location. *Building layout and spaces*, displays the specifications of the senior care-center involved with spatial organization, interior elements, and household comfort.

Social factors are derived by two groups of attributes including safety, and security (in one group) and residents and family interactions in the other one. All classified factors have been applied to the two selected precedents in order to analyze existing situation statues of these cases.

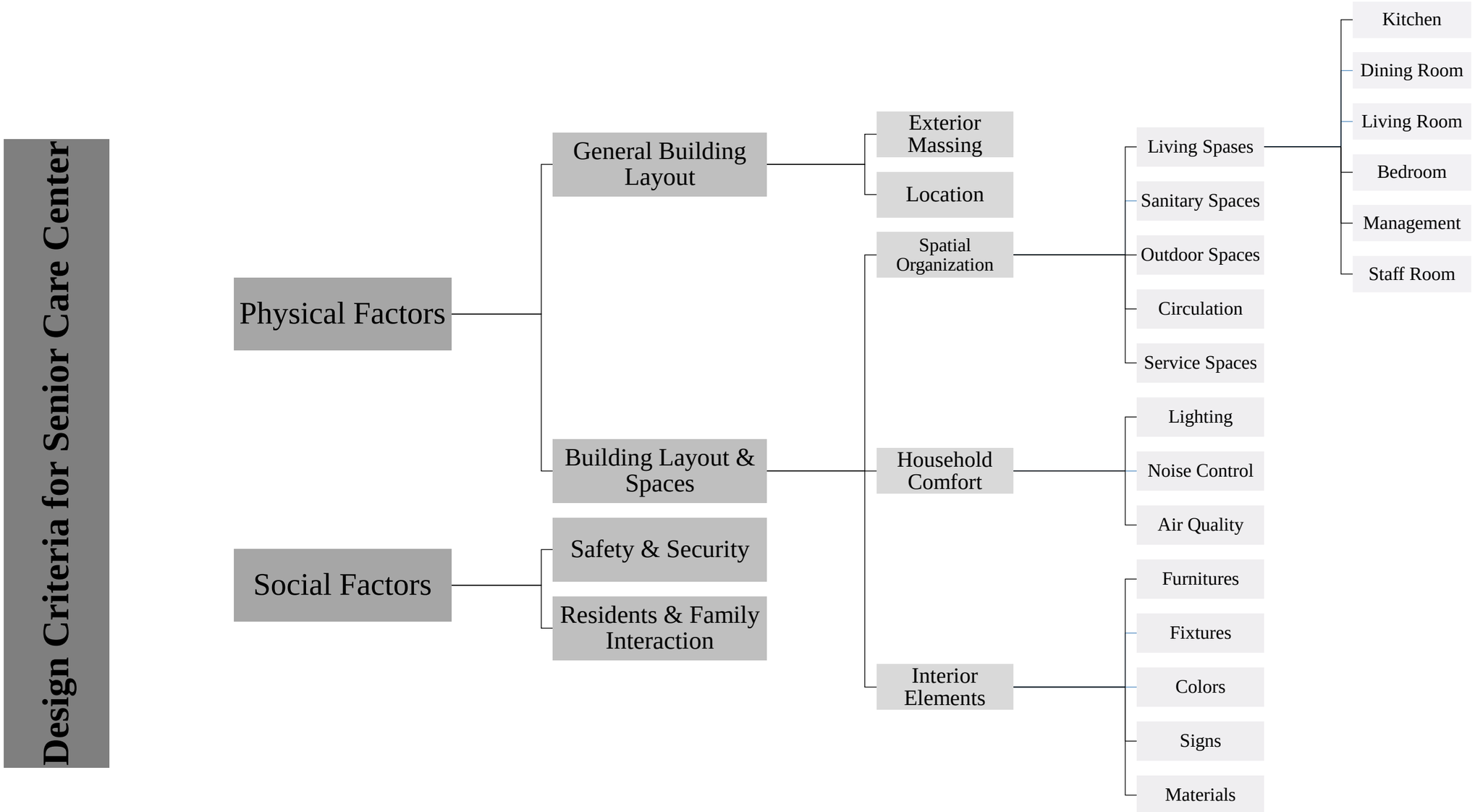

Figure 26: Design Criteria for Senior Care Center Related to Dementia

Physical Factor	General building Layout	**Location**		According to universal design guidelines, elderly group homes are not allowed to be located in an industrial area	
		Exterior Mass		Human scale	Exterior massing should be articulated (with distinct elements and walls that jog to create different planes, rather than a solid, monolithic façade)
					Facades should contain a discernable pattern of mass to void, or windows and doors to solid mass
				Buildings can be stand-alone buildings in a neighborhood or Single building	Stand-alone buildings in a neighborhood: Create small-sized groups of buildings, forming clusters or "households" of 10 to 14 residents in each
					Single building: small sized clusters or "households" of 10 to 14 residents shared common spaces in a building
				Applying Residential Design & appropriate material related to the local area	
	Building Layout & Spaces	Spatial Organization	**Living Spaces**	**Bed Room**	Personalization of residents bedrooms
					Residential space and elements
					Provision of a direct visual connection from the bed to the toilet
					Single rooms with a minimum of 12sq meters usable floor-space (excluding en-suite facilities).
					Personalization at bedroom entrances each cluster entrances
					Important items and spaces for daily activities should be easily seen and located to promote use
					Separate residents' bedrooms from activity areas
					Single bedrooms should be minimum 80% of whole residents bedrooms
					Each single bedroom should have clear Area 15.71 sq. m
					The bedroom doorway must provide a minimum clear width of 820mm
					Allow for seating in each resident's bedroom
					Each Resident with a single bedroom
					The bedrooms shall provide views to the exterior landscape
					An environment, which accommodates between 8 and 12 residents, can maintain a domestic character
				Kitchen	Views to the outdoors
					Residential kitchens for enhancing home-like experiences
					Kitchen space should have access to building circulation corridors for servicing residents and access to outside for receiving material and waste disposal
					Kitchen can be open or closed (open kitchen increase sense of residential space but should have limited access to cabinets and dangerous stuffs)
				Dining Room	The dining room shall provide views to the exterior landscape
					The dining area is a flexible space that can accommodate 25 to 30 residents
				Living Room	Distinct, and various spaces in character (use of different colors and furniture's)
					Residential space and elements
					Avoid multi-purpose rooms
					Shared, resident-accessed spaces, and semi-private spaces (some visual and acoustic privacy)
					Living rooms provide maximum visibility of residents by staff and allow for activities
					Living room should create an atmosphere for social interaction, sitting, visiting with family, friends and care givers
					Living rooms should have views to the exterior landscape and south face to get daylight.
				Staff Room	Staff facilities should be collocated with other staff room functions and be in close proximity with the staff entrance
					Staff Working Space should be positioned so that care/service staff have clear visual access to the residents
					Integrate the staff workstation into the residence
					Staff Working Space should provide private space for working, while offering residents easy access to staff
					Staff Working Space should include secure but readily accessible storage areas for equipment such as cleaning materials
					Staff Working Space: have doorways to service areas creatively camouflaged to reduce the interest of residents
					The care office should be designed to be the point of contact for residents, family members and visitors and as an information center
					Staff rooms Doors not used by residents shall be color coded to blend in with wall colors
					Staff rooms have to located near to staff washing rooms and medication rooms
				Management Room	Administration Services: The main administration area will include management offices and will accommodate waiting space for visitors, a reception clerical area, and file storage
			Circulation	**Indoor Circulation**	Multiple walking loops
					Do not terminate circulation paths in dead ends
					Access to "safe" areas
					The loop should pass next to or through designated activity zones
					Design Space with a minimum width of 1500 mm for passing and turning
					Toilets should be easily seen and able to be frequently accessed along the walking loop
				Outdoor Circulation	Multiple walking routes
					Ensure pathways are wide enough to accommodate a wheelchair
					Visible, easily accessible and user friendly
					Outdoor seating must occur adjacent to a level wandering path
					The outdoor walkway will be looped, no greater than 500 meters in total length. It will have a width of 1800 mm to permit 2 persons to pass one another easily using mobility aids such as walkers, canes or wheelchairs.
					Direction should be limited to avoid confusion
					An outdoor spaces should be well designed for physically and cognitively disabled residents
					Give residents unrestricted access to a secure outdoor space, when appropriate
			Sanitary Spaces		An attached private bathroom for each bedrooms, with a shower and enough space for an assisting staff person
					The entrance to the resident rest room should be from within the resident bedroom.
					Calm and peaceful Bathing spaces
					Have unobtrusive supporting hardware, e.g. grab rails
					Safe features
					The common resident washroom shall be adjacent to the dining area, living room and/or outdoor recreation space
					Bathroom for single bedrooms should have minimum clear Area 4.76 sq. m Bathroom for double bedrooms should have minimum clear Area 6.14 sq. m
					The resident washroom shall be adjacent to the dining area, living room and/or outdoor recreation space.
					Toilets are positioned in close proximity to the areas, but provide unobtrusive entry to maximize privacy

Table 1: Physical Factors Analysis

Physical Factor	Building Layout & Spaces	Spatial Organization	Service Spaces	Provide some separate service rooms to keep cleaning material and stuffs , carts, housekeeping stuffs
				Service rooms should be accessible just for staff and near to staff Rooms with door color code same as walls to be hidden from residents view
				A storage room shall be located adjacent the bathing suite.
				Storage areas are provided for aids and equipment, including wheelchairs
			Outdoor Spaces	Visible, easily accessible, and user friendly
				Large enough to satisfy a need to walk for lengthy periods
				Enticing and interesting and safe
				Provided with fixed seating
				Enclosed garden
				Landscaped outdoor resident spaces are required, complete with barrier free and wheelchair accessible walkways,
				Pathways must not dead end and preferably be looped in configuration with a paved 2% gradient at building entrances with a maximum gradient of 5% for parking areas and related sidewalks.
				Pavement in outdoor resident concrete surfaces should be colored to reduce glare
				Provide handrails for all stairs, ramps, and used to assist residents on level outdoor walkways.
				Non-poisonous plants, trees, and etc.(cactus , barbed, allergens plants are forbidden)
				Provide seating and other places for residents to socialize along the loop
				Provide some Shelter as semi open spaces
				The site design must provide unobstructed access for fire department and ambulance vehicles, adequate parking for visitors and staff, and, for shipping and receiving activities.
				Pedestrian and cyclist traffic should be separate from vehicle traffic.
				The walkway will be constructed of a continuous hard material.
				Providing Arbores, umbrella tables, shaded swings provide protection from the hot sun and wind.
			Interior Elements	Glass-fronted cabinets to be visibly accessible to residents
				Residents' bedrooms should have a closet/wardrobe unit with two compartments: 1) seasonally or daily clothing 2)additional clothing (lockable)
				Easy cleanable and durable flooring material
				Flexible furniture
				Food should be available at all times in the kitchen
				Provide lockable storage cabinet(s) and/or drawer(s) for toiletries, razors and other items that residents should not have direct access
				Location landmarks at junction points for easy orientation
				Identify things and spaces by names and numbers and visual cues
				Encouraging sensory cues to attract residents to eat (smell of the food)
				Use Dutch doors, which when the upper half is left open limits actual entry but allows staff and residents to look into private bedrooms for monitoring and orientation
				Use of color, texture and design to assist the identification of/or alternatively conceal of spaces
				Furnishings of communal rooms should be domestic in character and of good quality, and suitable for the range of interests and activities
				Doors should be of width sufficient to allow wheelchair users adequate access(Minimum clear opening external doors 800 mm and Minimum clear opening internal doors 750 mm)
				Adjustable beds should be provided for service users receiving nursing care.
				Screening should be provided in double rooms to ensure privacy for personal care.
				Doors used by residents shall be color coded to contrast walls to prompt resident use
				Height of the windows enables the service user to see out of it when seated or in bed.
				Pipe work and radiators are guarded or have guaranteed low temperature surfaces.
				Flooring shall be matte finish and solid color.
				Floor colors should contrast with wall colors.
				Windows dimension should provide a maximum 150mm
				Depending on a residents care requirements, residents can put their personal things and memories on some furnishings
		Household Comfort	Indoor Temperature	Occupied temperature heating: 24 °C and cooling 26 °C for residents.
				Occupied temperature heating: 22 °C and 24 °C cooling for administration offices and staff areas
				Occupied temperature heating: 22 °C and 26 °C cooling for kitchen and dietary
				The building envelope should be designed related to a standard for the climate, location and building occupancy.
			Air Quality	Ventilation for Acceptable Indoor Air Quality
				Rooms should be mechanically and naturally ventilated with windows conforming to recognized standards.
			Lighting	Higher level of illumination for aging eyes
				Higher intensity lighting for drop-off axis specially entrances
				Glare free lighting (artificial and natural)
				Appropriate lighting for daily activities
				Lighting should be placed at lower part (for people who use walker and wheelchair) and upper part
				Living area with variety of different lightings
				Use of architectural shading elements and location of some trees to control day-light
				Use Non-reflective furnishing surfaces to reduce glare issue
				Controlling quality and quantity of daylight by kind of glazing material for windows, blinds, curtain, and screens
				Emergency lighting should be provided throughout the home
			Controlling of Noise	Applying good acoustics are important to well-being
				Locate residents away from noise producing areas (e.g. kitchens, delivery points, refuse collection)
				Use of noise insulating materials(use sound absorbing finishes)
				Provision of spaces with less disruptive levels of noise.
				Acoustically isolate resident rooms from each other and corridors
				Locate noise generating mechanical and electrical equipment away from resident

Table 1 :Physical Factor Analysis (

Social Factors	**Safety and Security**	Staff should be able to unobtrusively monitor residents throughout the interior and exterior common spaces
		All water faucets should be installed with hot water mixing values, where the water temperature remotely fixed
		Items like cleaning products, medicines, delicate electronics and certain utensils should be stored safely away for the residents' protection
		Flooring should be slip-resistant and glare-free flooring , avoid contrasting light and dark areas
		The home provides grab rails and other aids in corridors, bathrooms, toilets, communal rooms and where necessary in service users' own accommodation
		Welcoming entrances, but screened from active resident areas. Views to the parking lot should be blocked
		Disguise egress points, deterring resident access .Doors should be off-axis
		Secure emergency exit doors with an electric deadbolt
		Use technology, like personal GPS tracking systems to unobtrusively give staff information about residents
		Restrict window openings to no more than 15.5 cm
		Construct walking paths that are continuous and loop back to building entrances
		Provide secondary layers of security so if a resident gets past the first layer of security, he or she is still in a safe place.
		Residents should benefit from covered entrances that are protected from sun, wind and precipitation. Doors should be automatic or require minimal force and manual dexterity to open
		Screwed-type shower and sink drain cover plates
		Consider installing shutter doors over vanity mirrors, which can be closed if necessary
		Consider using mini-blinds or other coverings on windows and glass doors
		Provide views to the outdoors from interior spaces to help caregivers unobtrusively monitor residents who have gone outside.
		Locate outdoor spaces in serene settings
		Secure outdoor spaces with perimeter fencing at least 1.8 m high, and camouflage the fencing with landscape design features such as trees or shrubs
		If there is a service gate, a solid pathway should not link the gate and the garden's circulation loop
		Provide path and perimeter lighting in case someone leaves the building at night
		plantings should be nontoxic and have no sharp edges or abrasive leaves, thorns
		Residents should be able to be (unobtrusively) monitored along the walking loop
		Coverage of any unsafe areas
	Residents & family interaction	Staff require training and support to understand how to help residents to engage social activities
		Provide small private or semi-private group gathering spaces so residents can spend time with visitors outside of their bedrooms
		Consider ways to engage visiting family members and residents together
		Appropriate space and facilities for private occasions including family visits
		Assortment of designated activity spaces that can support different-sized groups
		Activity zones should be familiar, tapping into residents' long-term memory
		Activities and related materials should be easy to find and access
		Residents should be able to preview activities before joining in

Table 2: Social Factor Analysis

Precedents Analysis

In order to understand the value in the existing examples, best building practices have been selected as precedents. However, due to the fact that there is not many senior care centers specifically designed for people with dementia problems, yet alone Alzheimer's disease, only two examples have been looked at. One of these is a dementia village in Netherlands and the other a community living center for veterans in USA.

Precedents Analysis 1: U.S. Department of Veterans Affairs | VA Illiana Health Care System Community Living Center (CLC), Danville, Ill

This sample of the VA Illiana Health Care System Community Living Centers decided to renovate or build new Community Living Centers on several medical campuses all over the country.

The CLCs specification has been trying to create living areas to make attractive place to accumulate aged people, to prevent them from frustration and loneliness. Open kitchens increase active engagement, independence, control, and flexible rhythms by providing opportunity to see the activities in kitchen, smelling, and take apart in cooking and food preparation. Brief and adequate foyers and hallways together with direct view of bedrooms to the common spaces have led to enhance communication and participation also decrease reliance on assistance devices and caregivers.

Having high accessibility to all home spaces, with variety of common spaces such as, physical therapy room, garage, patios, and spa are the other positive points (Figure 27-29). The residence has this opportunity to take part in house keeping and various

kinds of activities within the household. The appropriate small scale of living area has encouraged residents to make high quality of life and increase the residence satisfaction. There has been reported high daily activity of residence with no decline. Likewise, on-existence of prevalence of depression, unexpected weight change, and incontinence has approved the precision and validity of this senior health care center. All classified factor has been applied to U.S. Department of Veterans Affairs | VA Illiana Health Care System Community Living Centers, Danville, Ill to analyze existing situation statues Table 3 and Table 4.

	
Open layout and visually connected spaces, inside and out, allow care givers to unobtrusively monitor residents in USVA senior care center.	İnterior finishes and furnishings can be easy to maintain and durable while still looking residential in USVA senior care center

Figure 27: Indoor Spaces USVA Senior Care Center (Lemke, S. 2012).

Figure 28: Common Living Space, Resident Bedroom, USV (Lemke, S. 2012).

The Exterior of USVA Senior Care Center helps convey home, through its residential massing and scale, articulated facade and architectural details.	Residence of USVA can Access the out doors by secure garden courtyard

Figure 29: Outdoor Spaces USVA Senior Care Center (Lemke, S. 2012).

				Explanation		Existing Status
Physical Factors	General building Layout	Location		According to universal design guidelines, elderly group homes are not allowed to be located in an industrial area		☑
		Exterior Mass		Human scale	Exterior massing should be articulated (with distinct elements and walls that jog to create different planes, rather than a solid, monolithic façade).	☑
					Facades should contain a discernable pattern of mass to void, or windows and doors to solid mass.	
				Buildings can be stand-alone buildings in a neighborhood or Single building	**Stand-alone buildings in a neighborhood**: Create small-sized groups of buildings, forming clusters or "households" of 10 to 14 residents in each.	☑
					Single building: small sized clusters or "households" of 10 to 14 residents shared common spaces in a building.	☑
				Applying Residential Design & appropriate material related to the local area		☑
	Building Layout & Spaces	Spatial Organization	Living Spaces	Bedroom	Personalization of residents bedrooms	☑
					Residential space and elements	☑
					Provision of a direct visual connection from the bed to the toilet	☑
					Single rooms with a minimum of 12sq meters usable floor-space (excluding en-suite facilities).	☑
					Personalization at bedroom entrances each cluster entrances	☑
					Important items and spaces for daily activities should be easily seen and located to promote use	☑
					Separate residents' bedrooms from activity areas	☑
					Single bedrooms should be minimum 80% of whole residents bedrooms	☑
					Each single bedroom should have clear Area 15.71 sq.m.	☑
					The bedroom doorway must provide a minimum clear width of 820mm	☑
					Allow for seating in each resident's bedroom	☑
					Each Resident with a single bedroom	☑
					The bedrooms shall provide views to the exterior landscape	☑
					An environment, which accommodates between 8 and 12 residents, can maintain a domestic character	☑
				Kitchen	Views to the outdoors	☑
					Residential kitchens for enhancing home-like experiences	☑
					Kitchen space should have access to building circulation corridors for servicing residents and access to	☑
					Outside for receiving material and waste disposal	☑
					Kitchen can be open or closed (open kitchen increase sense of residential space but should have limited access to cabinets and dangerous stuffs)	☑
					The dining room shall provide views to the exterior landscape	☑
					The dining area is a flexible space that can accommodate 25 to 30 residents	☑
				Living Room	Distinct, and various spaces in character (use of different colors and furniture)	☑
					Residential space and elements	☑
					Avoid multi-purpose rooms	☑
					Shared, resident-accessed spaces, and semi-private spaces (some visual and acoustic privacy)	Residents have access to all areas of their home, including a physical therapy room, spa, den, garage, and front and back outdoor patios.
					Living rooms provide maximum visibility of residents by staff and allow for activities	☑
					Living room should create an atmosphere for social interaction , sitting ,visiting with family , friends and care givers	☑
					Living rooms should have views to the exterior landscape and south face to get daylight.	☑
				Staff Room	Staff facilities should be collocated with other staff room functions and be in close proximity with the staff entrance	Not mentioned
					Staff Working Space should be positioned so that care/service staff have clear visual access to the residents	☑
					Integrate the staff workstation into the residence	☑
					Staff Working Space should provide private space for working, while offering residents easy access to staff	Not mentioned
					Staff Working Space should include secure but readily accessible storage areas for equipment such as cleaning materials	Not mentioned
					Staff Working Space: have doorways to service areas creatively camouflaged to reduce the interest of residents	Not mentioned
					The care office should be designed to be the point of contact for residents, family members and visitors and as an information center	Not mentioned
					Staff rooms Doors not used by residents shall be color coded to blend in with wall colors	Not mentioned
					Staff rooms have to located near to staff washing rooms and medication rooms	Not mentioned
				Management Room	Administration Services: The main administration area will include management offices and will accommodate waiting space for visitors, a reception clerical area, and file storage	Not mentioned

Table 3: Physical Factor Analysis of USVA

Physical Factors	Building Layout & Spaces	Spatial Organization	Circulation	Indoor Circulation	Multiple walking loops	☑
					Do not terminate circulation paths in dead ends	☑
					Access to “safe” areas	☑
					The loop should pass next to or through designated activity zones	☑
					Design Space with a minimum width of 1500 mm for passing and turning	☑
					Toilets should be easily seen and able to be frequently accessed along the walking loop	☑
				Outdoor Circulation	Multiple walking routes	☑
					Ensure pathways are wide enough to accommodate a wheelchair	☑
					Visible, easily accessible and user friendly	☑
					Outdoor seating must occur adjacent to a level wandering path	Not mentioned
					The outdoor walkway will be looped, no greater than 500 meters in total length. It will have a width of 1800 mm to permit 2 persons to pass one another easily using mobility aids such as walkers, canes or wheelchairs.	Not mentioned
					Direction should be limited to avoid confusion	Not mentioned
					An outdoor spaces should be well designed for physically and cognitively disabled residents	Not mentioned
					Give residents unrestricted access to a secure outdoor space, when appropriate	Not mentioned
			Sanitary Spaces		An attached private bathroom for each bedrooms, with a shower and enough space for an assisting staff person	☑
					The entrance to the resident rest room should be from within the resident bedroom.	☑
					Calm and peaceful Bathing spaces	☑
					Have unobtrusive supporting hardware, e.g. grab rails	☑
					Safe features	☑
					The common resident washroom shall be adjacent to the dining area, living room and/or outdoor recreation space.	☑
					Bathroom for single bedrooms should have minimum clear Area 4.76 sq. m	Not mentioned
					Bathroom for double bedrooms should have minimum clear Area 6.14 sq. m	
					The resident washroom shall be adjacent to the dining area, living room and/or outdoor recreation space.	☑
					Toilets are positioned in close proximity to the areas, but provide unobtrusive entry to maximize privacy	☑
			Service Spaces		Provide some separate service rooms to keep cleaning material and stuffs , carts, housekeeping stuffs	☑
					Service rooms should be accessible just for staff and near to staff Rooms with door color code same as walls to be hidden from residents view	☑
					A storage room shall be located adjacent the bathing suite.	☑
					Storage areas are provided for aids and equipment, including wheelchairs	☑
			Outdoor Spaces		Visible, easily accessible, and user friendly	☑
					Large enough to satisfy a need to walk for lengthy periods	☑
					Enticing and interesting ,and safe	Not mentioned
					Provided with fixed seating	Not mentioned
					Enclosed garden	Not mentioned
					Landscaped outdoor resident spaces are required, complete with barrier free and wheelchair accessible walkways	☑
					Pathways must not dead end and preferably be looped in configuration with a paved 2% gradient at building entrances with a maximum gradient of 5% for parking areas and related sidewalks.	Not mentioned
					Pavement in outdoor resident concrete surfaces should be colored to reduce glare	☑
					Provide handrails for all stairs, ramps, and used to assist residents on level outdoor walkways.	☑
					Non-poisonous plants, trees, and etc.(cactus , barbed, allergens plants are forbidden)	Not mentioned
					Provide seating and other places for residents to socialize along the loop	Not mentioned
					Provide some Shelter as semi open spaces	Not mentioned
					The site design must provide unobstructed access for fire department and ambulance vehicles, adequate parking for visitors and staff, and, for shipping and receiving activities.	Not mentioned
					Pedestrian and cyclist traffic should be separate from vehicle traffic.	Not mentioned
					The walkway will be constructed of a continuous hard material.	☑
					Providing Arbours, trellises, umbrella tables, shaded swings provide protection from the hot sun and wind.	Not mentioned
			Interior Elements		Glass-fronted cabinets to be visibly accessible to residents	☑
					Residents’ bedrooms should have a closet/wardrobe unit with two compartments: 1) seasonally or daily clothing 2)additional clothing (lockable)	Not mentioned
					Easy cleanable and durable flooring material	☑
					Flexible furniture	☑
					Food should be available at all times in the kitchen	☑
					Provide lockable storage cabinet(s) and/or drawer(s) for toiletries, razors and other items that residents should not have direct access	☑
					Location landmarks at junction points for easy orientation	Not mentioned
					Identify things and spaces by names and numbers and visual cues	Not mentioned
					Encouraging sensory cues to attract residents to eat (smell of the food)	Not mentioned
					Use Dutch doors, which when the upper half is left open limits actual entry but allows staff and residents to look into private bedrooms for monitoring and orientation	Not mentioned
					Use of color, texture and design to assist the identification of/or alternatively conceal of spaces	☑
					Furnishings of communal rooms should be domestic in character and of good quality, and suitable for the range of interests and activities	☑
					Doors should be of width sufficient to allow wheelchair users adequate access(Minimum clear opening external doors 800 mm and Minimum clear opening internal doors 750 mm)	☑
					Adjustable beds should be provided for service users receiving nursing care.	Not mentioned
					Screening should be provided in double rooms to ensure privacy for personal care.	Not mentioned
					Doors used by residents shall be color coded to contrast walls to prompt resident use	Not mentioned
					Height of the windows enables the service user to see out of it when seated or in bed.	☑
					Pipe work and radiators are guarded or have guaranteed low temperature surfaces.	Not mentioned
					Flooring shall be matte finish and solid color.	☑
					Floor colors should contrast with wall colors.	☑

Table 3: Physical Factor Analysis of USVA

Table 3: Physical Factor Analysis of USVA

Physical Factors	**Building Layout & Spaces**	**Household Comfort**	**Indoor Temperature**	Occupied temperature heating: 24 °C and cooling 26 °C for residents.	Not mentioned
				Occupied temperature heating: 22 °C and 24 °C cooling for administration offices and staff areas	Not mentioned
				Occupied temperature heating: 22 °C and 26 °C cooling for kitchen and dietary	Not mentioned
				The building envelope should be designed related to a standard for the climate, location and building occupancy	Not mentioned
			Air Quality	Ventilation for Acceptable Indoor Air Quality	Not mentioned
				Rooms should be mechanically and naturally ventilated with windows conforming to recognized standards.	Not mentioned
			Lighting	Higher level of illumination for aging eyes	Not mentioned
				Higher intensity lighting for drop-off axis specially entrances	Not mentioned
				Glare free lighting (artificial and natural)	Not mentioned
				Appropriate lighting for daily activities	Not mentioned
				Lighting should be placed at lower part (for people who use walker and wheelchair) and upper part	Not mentioned
				Living area with variety of different lightings	Not mentioned
				Use of architectural shading elements and location of some trees to control day-light	Not mentioned
				Use Non-reflective furnishing surfaces to reduce glare issue	Not mentioned
				Controlling quality and quantity of daylight by kind of glazing material for windows, blinds, curtain, and screens	Not mentioned
				Emergency lighting should be provided throughout the home	Not mentioned
			Controlling of Noise	Applying good acoustics are important to well-being	☑
				Locate residents away from noise producing areas (e.g. kitchens, delivery points, refuse collection)	☑
				Use of noise insulating materials(use sound absorbing finishes)	☑
				Provision of spaces with less disruptive levels of noise.	☑
				Acoustically isolate resident rooms from each other and corridors	☑
				Locate noise generating mechanical and electrical equipment away from resident	☑

		Explanation	Existing Status
Social Factors	Safety & Security	Staff should be able to unobtrusively monitor residents throughout the interior and exterior common spaces	Not mentioned
		All water faucets should be installed with hot water mixing values, where the water temperature remotely fixed	Not mentioned
		Items like cleaning products, medicines, delicate electronics and certain utensils should be stored safely away for the residents' protection.	Not mentioned
		Flooring should be slip-resistant and glare-free flooring , avoid contrasting light and dark areas	Not mentioned
		The home provides grab rails and other aids in corridors, bathrooms, toilets, communal rooms and where necessary in service users' own accommodation.	Not mentioned
		Welcoming entrances, but screened from active resident areas. Views to the parking lot should be blocked	Not mentioned
		Disguise egress points ,deterring resident access .Doors should be off-axis	Not mentioned
		Secure emergency exit doors with an electric deadbolt	Not mentioned
		Use technology, like personal GPS tracking systems to unobtrusively give staff information about residents	Not mentioned
		Construct walking paths that are continuous and loop back to building entrances.	Not mentioned
		Provide secondary layers of security so if a resident gets past the first layer of security, he or she is still in a safe place.	Not mentioned
		Residents should benefit from covered entrances that are protected from sun, wind and precipitation. Doors should be automatic or require minimal force and manual dexterity to open.	Not mentioned
		Screwed-type shower and sink drain cover plates	Not mentioned
		Consider installing shutter doors over vanity mirrors, which can be closed if necessary	Not mentioned
		Consider using mini-blinds or other coverings on windows and glass doors	Not mentioned
		Provide views to the outdoors from interior spaces to help caregivers unobtrusively monitor residents who have gone outside.	Not mentioned
		Locate outdoor spaces in serene settings	Not mentioned
		Secure outdoor spaces with perimeter fencing at least 1.8 m high, and camouflage the fencing with landscape design features such as trees or shrubs	Not mentioned
		If there is a service gate, a solid pathway should not link the gate and the garden's circulation loop	Not mentioned
		Provide path and perimeter lighting in case someone leaves the building at night	Not mentioned
		plantings should be nontoxic and have no sharp edges or abrasive leaves, thorns	Not mentioned
		Residents should be able to be (unobtrusively) monitored along the walking loop	Not mentioned
		Coverage of any unsafe areas;	Not mentioned
	Residents & family interaction	Staff require training and support to understand how to help residents to engage social activities	Setting elements for family or any gust in each resident's bedroom. Ability for families to visits their patient within appropriate indoor and outdoor space. Open living areas that provide an inviting place to gather, with an aim to combat loneliness. Open kitchens provide an opportunity to see, smell and participate in food preparation. They have the ability to participate in housekeeping and activity programming as they please, returning control to the residents and encouraging them to leave their rooms.
		Provide small private or semi-private group gathering spaces so residents can spend time with visitors outside of their bedrooms	
		Consider ways to engage visiting family members and residents together	
		Appropriate space and facilities for private occasions including family visits	
		Assortment of designated activity spaces that can support different-sized groups	
		Activity zones should be familiar, tapping into residents' long-term memory	
		Activities and related materials should be easy to find and access	
		Residents should be able to preview activities before joining in	

Table 4: Social Factor Analysis of USVA

Precedent Analysis 2: Dementia village The Amazing Village in Netherlands Just for People with Dementia (Hogeweyk).

Hogeweyk is located 20 miles south of Amsterdam in the small town of Weesp and is an award-winning development that pioneers an excitingly different kind of provision of residential and nursing care for people with advanced dementia.

Hogeweyk, created by Molenaar & VanDikken & Bol was opened in late 2009. Existing in The Netherlands, in Weesp. It is special because it was created essentially to be a safe haven for people with Dementia. Hogeweyk was primarily funded by the Dutch government and cost slightly more than $25 million to build. The cost of care is nearly $8,000 per month, but the Dutch government subsidizes the residents—all of whom receive private rooms—to varying degrees; the amount each family pays is based on income, but never exceeds $3,600. 250 nurses and doctors work full time and some part time to care for the 152 residents. Hogeweyk has 23 houses designed especially for their dementia patients as it has been shown in Figure 30. It offers 7 different lifestyles: goals (upper class), Homey, Urban, Christian, Artisan, Indonesian and Cultural. Residents work hand in hand with the staff members to do Daily chores like cooking and cleaning every single day.

Hogeweyk features 23 uniquely stylized homes, furnished around the time period when residents' short-term memories stopped properly functioning. There are homes resembling the 1950s, 1970s, and 2000s, accurate down to the tablecloths, because it helps residents feel as if they're home. All classified factor has been applied to Dementia village in Netherlands Just for People with Dementia (Hogeweyk) to analyze existing situation statues Table 5 and Table 6.

Figure 30: Hogeweyk Senior Health Center.

There's a supermarket for grocery shopping as well. Hogeweyk completely ensures the safety and privacy of its residents, there are streets, parks and squares designed for dementia patients. Residents do not have to pay Money or anything in exchange for cervices in the facilities, like bars or restaurants. Because everything is included in the payment plan. To make the patients comfortable, the caregivers are dressed casually to blend into the village without disturbing the comfort of the residents. Careers are usually neighbors in the working class environment, while different classes and lifestyle are different, each with their own type of music, interior design and food (Figure 31-32).

	
Secure wander garden, paths loop back to building entrance	The various interiors of the Hogeweyk senior care center

Figure 31: Indoor and Outdoor spaces Hogeweyk Senior Care Center

Figure 32: Site Plan of Hogweyk Senior Care Center

			Explanation		Existing Status
	General building Layout		According to universal design guidelines, elderly group homes are not allowed to be located in an industrial area		☑
		Exterior Mass	Human scale	Exterior massing should be articulated (with distinct elements and walls that jog to create different planes, rather than a solid, monolithic façade)	☑
				Facades should contain a discernable pattern of mass to void, or windows and doors to solid mass	
			Buildings can be stand-alone buildings in a neighborhood or Single building	**Stand-alone buildings in a neighborhood**: Create small-sized groups of buildings, forming clusters or "households" of 10 to 14 residents in each	☑
				Single building: small sized clusters or "households" of 10 to 14 residents shared common spaces in a building	☑
			Applying Residential Design & appropriate material related to the local area		☑
Physical Factors	Building Layout & Spaces	Spatial Organization	Living Spaces	Bedroom	Personalization of residents bedrooms	Hogeweyk is designed as a small neighborhood, within which people may come and go at will. selection of facilities, like a restaurant, a bar and a theatre Family, staff and the new resident choose which lifestyle will suit them. 7 different lifestyles Several seating areas allow residents to admire water features, models of Dutch buildings, and displays of old-fashioned toys The different living styles have different types of music playing, significantly varied interior design, food and methods of table setting
					Residential space and elements	
					Provision of a direct visual connection from the bed to the toilet	
					Single rooms with a minimum of 12sq meters usable floor-space (excluding en-suite facilities).	
					Personalization at bedroom entrances each cluster entrances	
					Important items and spaces for daily activities should be easily seen and located to promote use	
					Separate residents' bedrooms from activity areas	
					Single bedrooms should be minimum 80% of whole residents bedrooms	
					Each single bedroom should have clear Area 15.71 sq. m.	
					The bedroom doorway must provide a minimum clear width of 820mm	
					Allow for seating in each resident's bedroom	
					Each Resident with a single bedroom	
					The bedrooms shall provide views to the exterior landscape	
					An environment, which accommodates between 8 and 12 residents, can maintain a domestic character	
				Kitchen	Views to the outdoors	☑
					Residential kitchens for enhancing home-like experiences	☑
					Kitchen space should have access to building circulation corridors for servicing residents and access to	☑
					Outside for receiving material and waste disposal	☑
					Kitchen can be open or closed (open kitchen increase sense of residential space but should have limited access to cabinets and dangerous stuffs)	☑
					The dining room shall provide views to the exterior landscape	☑
					The dining area is a flexible space that can accommodate 25 to 30 residents	☑
				Living Room	Distinct, and various spaces in character (use of different colors and furniture's)	☑
					Residential space and elements	☑
					Avoid multi-purpose rooms	☑
					Shared, resident-accessed spaces, and semi-private spaces (some visual and acoustic privacy)	Residents have access to all areas of their home, including a physical therapy room, spa, den, garage, and front and back outdoor patios.
					Living rooms provide maximum visibility of residents by staff and allow for activities	☑
					Living room should create an atmosphere for social interaction , siting ,visiting with family , friends and care givers	☑

Table 5: Physical Factor Analysis of Hogeweyk

Physical Factor	Building Layout & Spaces	Spatial Organization	Living Spaces	Staff Room	Staff facilities should be collocated with other staff room functions and be in close proximity with the staff entrance	Not mentioned
					Staff Working Space should be positioned so that care/service staff have clear visual access to the residents	☑
					Integrate the staff workstation into the residence	☑
					Staff Working Space should provide private space for working, while offering residents easy access to staff	☑
					Staff Working Space should include secure but readily accessible storage areas for equipment such as cleaning materials	☑
					Staff Working Space: have doorways to service areas creatively camouflaged to reduce the interest of residents	☑
					The care office should be designed to be the point of contact for residents, family members and visitors and as an information center	☑
					Staff rooms Doors not used by residents shall be color coded to blend in with wall colors	☑
					Staff rooms have to located near to staff washing rooms and medication rooms	☑
				geme nt	Administration Services: The main administration area will include management offices and will accommodate waiting space for visitors, a reception clerical area, and file storage	☑
			Circulation	Indoor Circulation	Multiple walking loops	☑
					Do not terminate circulation paths in dead ends	☑
					Access to “safe” areas	☑
					The loop should pass next to or through designated activity zones	☑
					Design Space with a minimum width of 1500 mm for passing and turning	☑
					Toilets should be easily seen and able to be frequently accessed along the walking loop	☑
				Outdoor Circulation	Multiple walking routes	☑
					Ensure pathways are wide enough to accommodate a wheelchair	☑
					Visible, easily accessible and user friendly	☑
					Outdoor seating must occur adjacent to a level wandering path	Not mentioned
					The outdoor walkway will be looped, no greater than 500 meters in total length. It will have a width of 1800 mm to permit 2 persons to pass one another easily using mobility aids such as walkers, canes or wheelchairs.	Not mentioned
					Direction should be limited to avoid confusion	Not mentioned
					An outdoor spaces should be well designed for physically and cognitively disabled residents	Not mentioned
					Give residents unrestricted access to a secure outdoor space, when appropriate	Not mentioned
			Sanitary Spaces		An attached private bathroom for each bedrooms, with a shower and enough space for an assisting staff person	☑
					The entrance to the resident rest room should be from within the resident bedroom.	☑
					calm and peaceful Bathing spaces	☑
					Have unobtrusive supporting hardware, e.g. grab rails	☑
					Safe features	☑
					The common resident washroom shall be adjacent to the dining area, living room and/or outdoor recreation space.	☑
					Bathroom for single bedrooms should have minimum clear Area 4.76 sq. m	Not mentioned
					Bathroom for double bedrooms should have minimum clear Area 6.14 sq. m	Not mentioned
					The resident washroom shall be adjacent to the dining area, living room and/or outdoor recreation space.	☑
					toilets are positioned in close proximity to the areas, but provide unobtrusive entry to maximize privacy	☑

Table 5: Physical Factor Analysis of Hogeweyk

Physical Factors	Spatial Organization	Service Spaces	provide some separate service rooms to keep cleaning material and stuffs , carts, housekeeping stuffs	☑
			Service rooms should be accessible just for staff and near to staff Rooms with door color code same as walls to be hidden from residents view	☑
			A storage room shall be located adjacent the bathing suite.	☑
			Storage areas are provided for aids and equipment, including wheelchairs	☑
		Outdoor Spaces	Visible, easily accessible, and user friendly	☑
			Large enough to satisfy a need to walk for lengthy periods	☑
			Enticing and interesting ,and safe	Not mentioned
			Provided with fixed seating	Not mentioned
			Enclosed garden	Not mentioned
			Landscaped outdoor resident spaces are required, complete with barrier free and wheelchair accessible walkways	☑
			Pathways must not dead end and preferably be looped in configuration with a paved 2% gradient at building entrances with a maximum gradient of 5% for parking areas and related sidewalks.	Not mentioned
			Pavement in outdoor resident concrete surfaces should be colored to reduce glare	☑
			Provide handrails for all stairs, ramps, and used to assist residents on level outdoor walkways.	☑
			Non-poisonous plants, trees, and etc.(cactus , barbed, allergens plants are forbidden)	Not mentioned
			Provide seating and other places for residents to socialize along the loop	☑
			Provide some Shelter as semi open spaces	☑
			The site design must provide unobstructed access for fire department and ambulance vehicles, adequate parking for visitors and staff, and, for shipping and receiving activities.	☑
			Pedestrian and cyclist traffic should be separate from vehicle traffic.	☑
			The walkway will be constructed of a continuous hard material.	☑
			Providing Arbours, trellises, umbrella tables, shaded swings provide protection from the hot sun and wind.	☑
	Building Layout & Spaces	Interior Elements	Glass-fronted cabinets to be visibly accessible to residents	☑
			Residents' bedrooms should have a closet/wardrobe unit with two compartments: 1) seasonally or daily clothing 2)additional clothing (lockable)	Not mentioned
			Easy cleanable and durable flooring material	☑
			Flexible furniture	☑
			Food should be available at all times in the kitchen	
			Provide lockable storage cabinet(s) and/or drawer(s) for toiletries,	☑
			Location landmarks at junction points for easy orientation	☑
			Identify things and spaces by names and numbers and visual cues	☑
			Encouraging sensory cues to attract residents to eat (smell of the food)	hose whose dementia is so severe t hey are unable to participate are ke nvolved by the sights, sounds and smells of food preparation
			Use Dutch doors, which when the upper half is left open limits actual entry but allows staff and residents to look into private bedrooms for monitoring and orientation	Not mentioned
			Use of color, texture and design to assist the identification of/or alternatively conceal of spaces	☑
			Furnishings of communal rooms should be domestic in character and of good quality, and suitable for the range of interests and activities	☑
			Doors should be of width sufficient to allow wheelchair users adequate access(Minimum clear opening external doors 800 mm and Minimum clear opening internal doors 750 mm)	☑
			Adjustable beds should be provided for service users receiving nursing care.	☑
			Screening should be provided in double rooms to ensure privacy for personal care.	☑
			Doors used by residents shall be color coded to contrast walls to prompt resident use	☑
			Height of the windows enables the service user to see out of it when seated or in bed.	☑

Table 5: Physical Factor Analysis of Hogeweyk

Table 5: Physical Factor Analysis of Hogeweyk

Physical Factors	**Building Layout & Spaces**	**Household Comfort**	**Indoor Temperature**	Occupied temperature heating: 24 °C and cooling 26 °C for residents.	High level reported of life quality and Convenience
				Occupied temperature heating: 22 °C and 24 °C cooling for administration offices and staff areas	
				Occupied temperature heating: 22 °C and 26 °C cooling for kitchen and dietary	
				The building envelope should be designed related to a standard for the climate, location and building occupancy.	
			Air Quality	Ventilation for Acceptable Indoor Air Quality	
				Rooms should be mechanically and naturally ventilated with windows conforming to recognized standards.	
			Lighting	Higher level of illumination for aging eyes	
				Higher intensity lighting for drop-off axis specially entrances	
				Glare free lighting (artificial and natural)	
				Appropriate lighting for daily activities	
				Lighting should be placed at lower part (for people who use walker and wheelchair) and upper part	
				Living area with variety of different lightings	
				Use of architectural shading elements and location of some trees to control day-light	
				Use Non-reflective furnishing surfaces to reduce glare issue	
				Controlling quality and quantity of daylight by kind of glazing material for windows, blinds, curtain, and screens	
				Emergency lighting should be provided throughout the home	
			Controlling of Noise	Applying good acoustics are important to well-being	☑
				Locate residents away from noise producing areas (e.g. kitchens, delivery points, refuse collection)	☑
				Use of noise insulating materials(use sound absorbing finishes)	☑
				Provision of spaces with less disruptive levels of noise.	☑
				Acoustically isolate resident rooms from each other and corridors	☑
				Locate noise generating mechanical and electrical equipment away from resident	☑

		Explanation	Existing Status
Social Factors	Safety & Security	Staff should be able to unobtrusively monitor residents throughout the interior and exterior common spaces	-At night, residents are left in the dark and quiet which successfully encourages their sleep. Assistive technology enables staff to monitor them without disturbing them. -Health and safety regulations are intelligently implemented. In Hogeweyk, there are only walkers or cyclists, so no concerns about road safety. -The entrance lobby has two sets of automatic sliding doors; the external ones being controlled by a friendly receptionist. maximum privacy and autonomy
		All water faucets should be installed with hot water mixing values, where the water temperature remotely fixed	
		Items like cleaning products, medicines, delicate electronics and certain utensils should be stored safely away for the residents' protection.	
		Flooring should be slip-resistant and glare-free flooring , avoid contrasting light and dark areas	
		The home provides grab rails and other aids in corridors, bathrooms, toilets, communal rooms and where necessary in service users' own accommodation.	
		Welcoming entrances, but screened from active resident areas. Views to the parking lot should be blocked	
		Disguise egress points ,deterring resident access .Doors should be off-axis	
		Secure emergency exit doors with an electric deadbolt	
		Use technology, like personal GPS tracking systems to unobtrusively give staff information about residents	
		Construct walking paths that are continuous and loop back to building entrances.	
		Provide secondary layers of security so if a resident gets past the first layer of security, he or she is still in a safe place.	
		Residents should benefit from covered entrances that are protected from sun, wind and precipitation. Doors should be automatic or require minimal force and manual dexterity to open.	
		Screwed-type shower and sink drain cover plates	
		Consider installing shutter doors over vanity mirrors, which can be closed if necessary	
		Consider using mini-blinds or other coverings on windows and glass doors	
		Provide views to the outdoors from interior spaces to help caregivers unobtrusively monitor residents who have gone outside.	
		Locate outdoor spaces in serene settings	
		Secure outdoor spaces with perimeter fencing at least 1.8 m high, and camouflage the fencing with landscape design features such as trees or shrubs	
		If there is a service gate, a solid pathway should not link the gate and the garden's circulation loop	
		Provide path and perimeter lighting in case someone leaves the building at night	
		Plantings should be nontoxic and have no sharp edges or abrasive leaves, thorns	
		Residents should be able to be (unobtrusively) monitored along the walking loop	
		Coverage of any unsafe areas;	
	Residents & family interaction	Staff require training and support to understand how to help residents to engage social activities Provide small private or semi-private group gathering spaces so residents can spend time with visitors outside of their bedrooms	-Setting elements for family or any gust in each resident's bedroom. -Ability for families to visits their patient within appropriate indoor and outdoor space -There are some activities in each house, all individualized to suit those particular residents, and also communal activities residents from any house can attend if they wish. -Wherever possible, staff includes a resident in their activities. To be served in the supermarket, they need to be accompanied by a resident, who can see the range of goods.
		Appropriate space and facilities for private occasions including family visits	
		Assortment of designated activity spaces that can support different-sized groups	
		Activity zones should be familiar, tapping into residents' long-term memory	
		Activities and related materials should be easy to find and access	
		Residents should be able to preview activities before joining in	

Table 6: Social Factor Analysis of Hogeweyk

Chapter 4

THE CASE STUDY: HALK VAKFI SENIOR CARE CENTER, ISKELE, NORTH CYPRUS

4.1 Introduction and Selected Characteristics

This study intends to investigate design criteria for elderly homes, especially for people with dementia. It is focus is on an elderly home, Halk Vakfi yaşlılar sitesi, which is located between the Iskele village and Aygun village and border village, Famagusta, North Cyprus. The first part of this chapter is specified for Methodology and data collection methods. Brief information about the case study mentioned within the second part. The third part allocated for analyzing the case study base on collected data through different methods.

4.2 Methodology

The case study evaluation has been done through qualitative methods. Having done literature review and illustrated notable attributes toward senior health care centers (by focusing on care canters for people suffering from dementia), research leads to prepare a summarized table of required criteria based on physical and social factors. Pilot case study selected for investigating it based on defined criteria and clearing out existing situation of Halk Vakfi yaşlılar sitesi. Accordingly, various methods used to fulfil desired aim. Observation, and site survey was the main methods. Observation occurred through visiting the Halk Vakfi yaşlılar sitesi, and photography. Indoor spaces and outdoor spaces of selected case study have been scrutinized. Based on

determined criteria one by one. Besides that, an organized interview performed with main manager and nurse working there.

4.3 Analysis of Halk Vakfi According to Specified Design Criteria

According to the mentioned methodology in previous parts, analysis has been done as two various factors:

- Analysis of Physical factors
- Analysis of Social factors

4.3.1 General information About Halk Vakfi yaşlılar sitesi

Halk Vakfi Yaşlılar Sitesi, is located between the Sınırüstü village and Aygun village near to Iskele City, In Famagusta, North Cyprus (Figure 33-34). Halk Vakfi was designed by a Turkish architect from Turkey and opened in September 2009. İt's important because it was designed specifically to Pioneer the comfort for the patients of dementia in the whole Famagusta. Halk Vakfi was primarily funded 1 million and 650 thousand Turkish Liras by the Republic of Turkey and its private owner is Malek Dogan whom establish this elderly house. The amount each family pays is about 1500 Turkish Liras and sometimes their relatives provide supplement and their other needs as charity.

Figure 33: Halk Vakfi North Cyprus Map

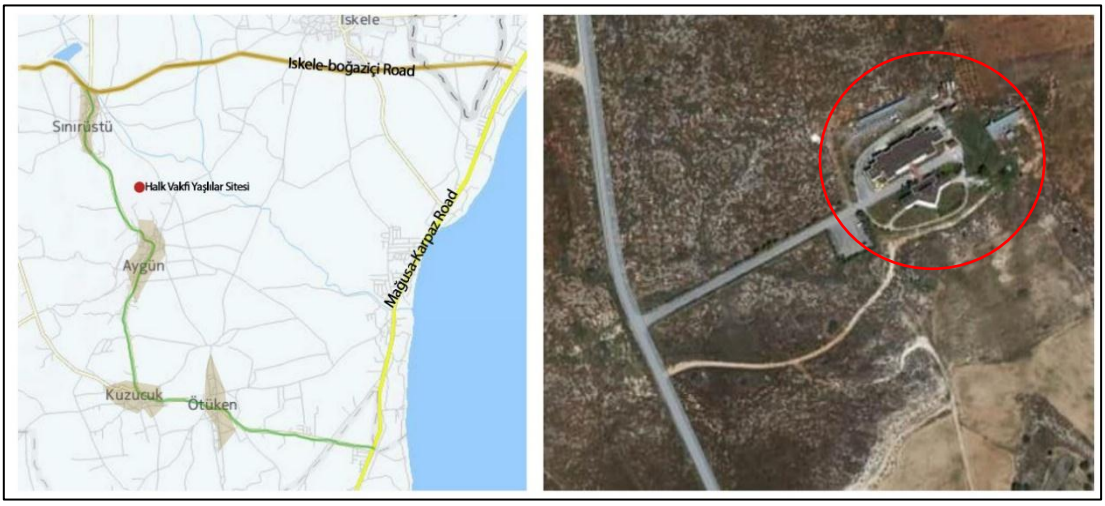

Figure 34: Road Accessibility to Halk Vakfi

4.3.2 Analysis of Physical Factors in Halk Vakfi Yaşlılar Sitesi

- **General building layout**

As it was mentioned general layout of the building is considered as one of the physical factors of the design criteria. Generally, it is divided into two main characteristics or sub-factors:1) exterior mass and 2) Location. This health care center is located between two residential areas and far from any industrial area. Although its location is in serene area, it is located far from other residential buildings. Accordingly, it's a single building separated from neighborhoods. Exterior mass of the building consists of two main boxes with some subtractions and one small box in between as a corridor and connector of Administrative area to residential area. Although a one-story building, with some openings throughout external façade, make this household relatively human-scale, but loss of various distinct elements and neglecting interesting façade design create a monotonous elevation for the building. The outside view of the building docent illustrates the residential area, and the prevalent used material of the building is sandwich panels.

According to the observation and map analysis Halk Vakfi yaşlılar sitesi is built up based on grouped organization with two branches. The left branch is assigned for

residents and care givers. The right part is dedicated to administrative spaces as it has been shown in Figure 35.

Figure 35: Halk Vakfi Yaslilar Sitesi Building Is a One Story Building and Human Scale.

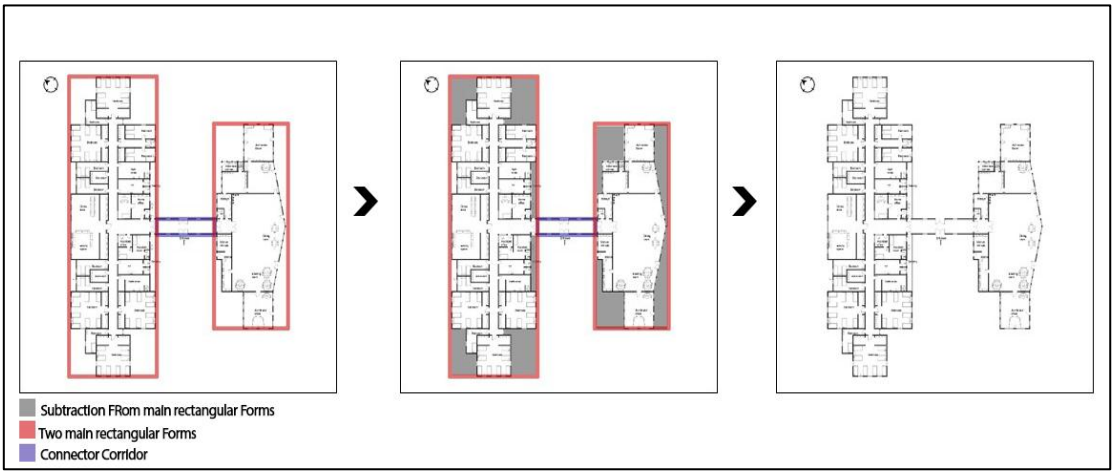

Figure 36: Exterior Mass of Halk Vakfi Building

- **Building Layout and spaces**

As it was mentioned in Table 1, building layout and spaces are named as the second factor under the physical category. Subsequently, in this part the case study is examined according to its spatial organization, household comfort, and interior elements. Observation, and photography, and site visit have been the main research techniques used to perceive the Building Layout and spaces characters (Figure 36).

- **Spatial organization**

Spatial organization is divided into five main sub-factors, which are living spaces, sanitary spaces, outdoor spaces, service spaces, and circulation. Following that, these sub-factors are investigated in the case study respectively.

- **Living spaces**

Living spaces is comprised of bedrooms, kitchen, dining room, management room, staff room, and living rooms.

- **Bedrooms**

Halk Vakfi yaşlılar sitesi have 13 bedrooms for residents which is designed with 5 rooms considered for 8 persons, 5 rooms considered for 2 persons, two single rooms, and one room considered for 3 persons. There is just two single bedrooms which occupying 15% of whole bedrooms. Halk Vakfi has 21 residents; 11 of them suffering from Alzheimer disease, 4 of them are retarded, two of them had phobia and other ones are suffering from other dementia. According to Figure 37, place of each resident bedroom (patients' bedrooms) is defined. According to Figure 37 residents part of the building are divided into two cluster north part and south part. Each cluster has one bathroom and two bathrooms. Just four of the bedrooms (double bedrooms) have direct visual connection to the restrooms. There are 5 typical floor plans for 8 people

bedrooms, six typical planes have been defined for 5 double bedrooms and only one triple bedroom, and there are two typical plans for single bedrooms. The sense of residential space with attractive atmosphere is not sensible there. The low contrast between wall and floor creates a space with therapeutic and somewhat far away from residential space.

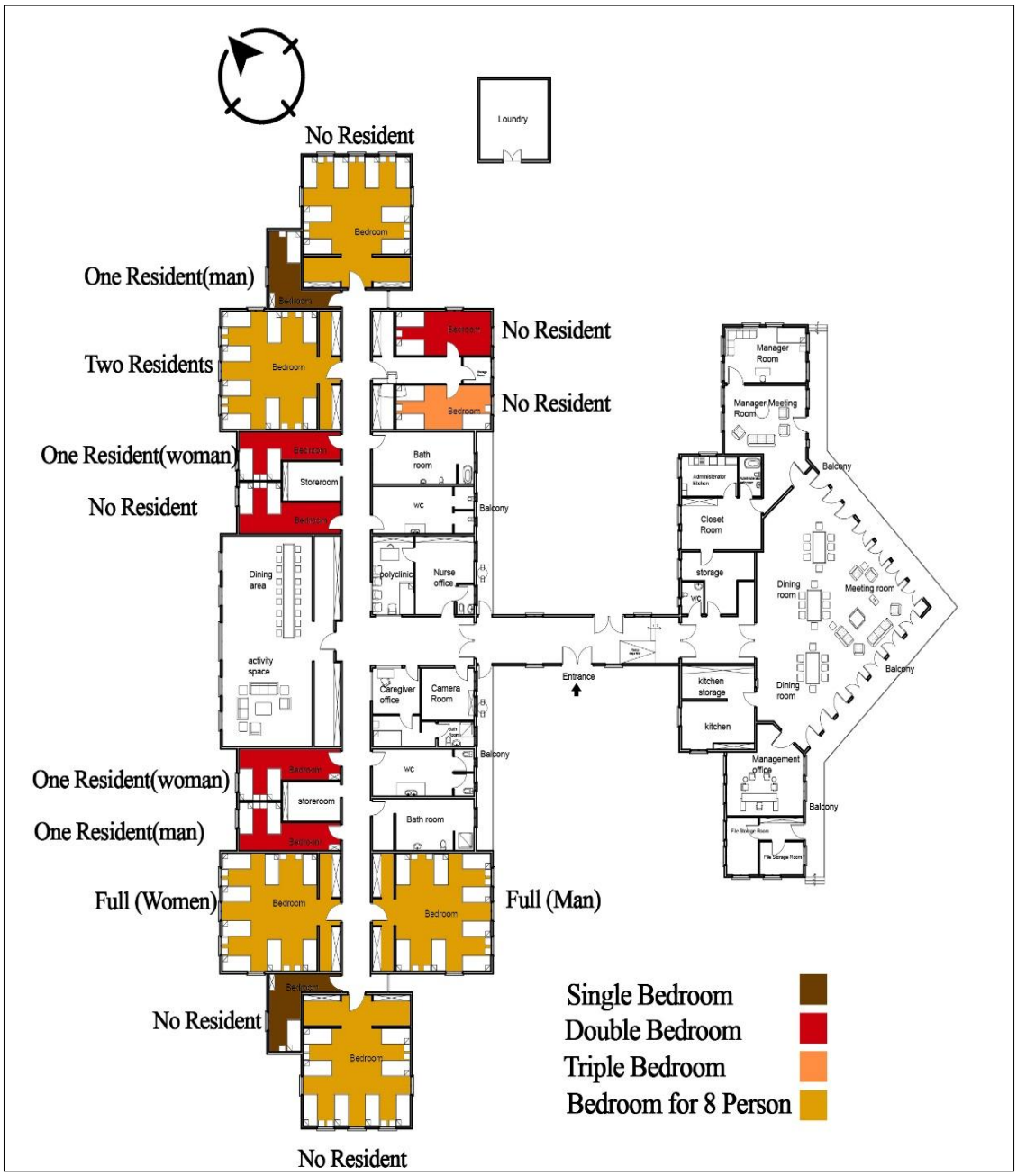

Figure 37: Residents Bedroom Location.

Single bedrooms area is separated from activity area. Single bedrooms have approximately 14.3 m² area. The entrance door is 100 cm of width and 84 cm clear door width. According to the Figure 38 related to first typical plan there are some photos related to the resident near to the bed at top of the radiator. UPVC Casement window is installed in bedroom with 120cm of width and 140 cm of height. All single bedrooms have view to the outdoor space. There is just only one plastic chair as a sitting facility.

Figure 38: Typical Single Bedroom Plan

Resident's area is separated from activity area. Double bedrooms (type1) have approximately 16.7 m² area. The entrance door is 100 cm of width and 84 cm clear door width. According to the Figure 39 there is no any clear features empowering personalization of bedroom. UPVC Casement window is installed in bedroom with 120cm of width and 140 cm of height. All Double bedrooms have view to the outdoor space. There is just only one plastic chair as a sitting facility.

Figure 39: Typical Double Bedroom Plan 1

Resident's area is separated from activity area. Double bedrooms (type2) have approximately 19.2 m² area. The entrance door is 100 cm of width and 88 cm clear door width. Within these rooms, there is no any sense of personalization. Likewise, the used material and finishing for floor and walls does not have enough contrast.

UPVC Casement window is installed in bedroom with 120cm of width and 140 cm of height. All Double bedrooms have view to the outdoor space. There are no any sitting elements as it has been shown in Figure 40.

Figure 40: Typical Double Bedroom Plan 2

Resident's area is separated from activity area. Bedrooms for 8 people have approximately 48m² area. The entrance door is 125 cm of width and 101 cm clear door width. UPVC Casement window is installed in bedroom with 120cm of width and 140 cm of height. All 8-person bedrooms have view to the outdoor space. There is no any sitting facilities within these rooms. Likewise, the used material and finishing for floor and walls does not have enough contrast as it has been shown in Figure 41.

Figure 41: Typical Bedroom Plan for 8 Residents

- **Living Room**

Halk Vakfi yaşlılar sitesi have one living room located between two residential clusters and accessible for residents. This area includes two different functions; One side is allocated for dinning area with a large Dining table, the other part is determined by some sitting elements (sofas) and TV for gathering and social interaction. By entering to the living area there are two storage spaces at left and right side consider for extra chairs, wheelchairs, and some required needs for residents. Although five windows create a good atmosphere through both having daylight and outdoor view facing to the west direction is not an appropriate direction

for living area. All windows are casement type, in two different sizes. Four of them are 120 cm by 140 cm and the other one is 240 of width and 140 of height. The activity space is not well designed by various furniture's and different characters. This area is accessible for residents and located in close proximity to the care-givers office. According to the Figure 35-36 living area (by considering dining area) occupying 84 m² of interior area with two storage spaces with 9.8 m² area for each. The main entrance door to this area has approximately 100 cm clear widths. Living spaces for Halk Vakfi has been shown in Figure 42-44.

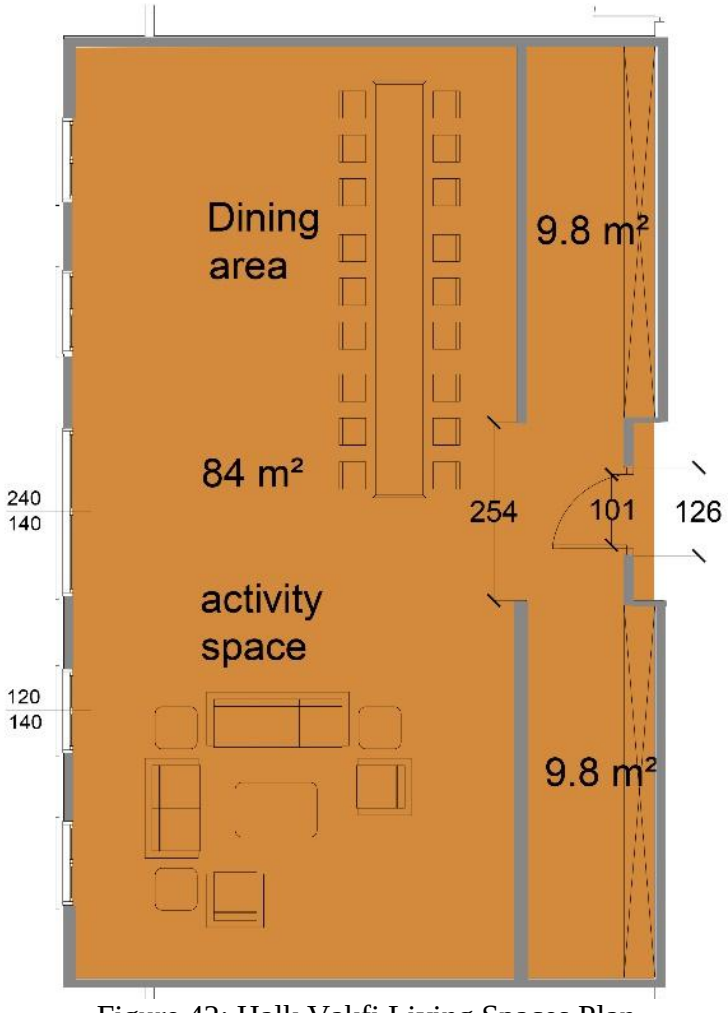

Figure 42: Halk Vakfi Living Spaces Plan

Figure 43: The plan showing Living Spaces in Halk Vakfi

Figure 44: Halk Vakfi Living Spaces

- **Kitchen**

The desired case study includes one kitchen area embedding wet kitchen (washing and keeping dishes) and dry kitchen (cooking and preparing foods). Kitchen room is not accessible for residents visually and physically. Just caregivers prepare food in this area. Kitchen area is located at administrative part of the building with two different access. The interior access is within the gathering area and the outdoor access is located close to the building main entrance for receiving material and waste disposal. Since the kitchen is designed as closed kitchen, it is not empowering sense of home-like experiences. The entrances width is wide enough for commuting of staffs and servicing. The desired kitchen, is located near to the interior gathering area, which during the ceremonies (meetings, gathering, events, and occasions), giving service to this area directly. There are two different windows within this space. One looks to the outdoor space (south-west direction) and the other one is faced to the interior gathering area. By locating the dining area within the living area the distance between kitchen and living area is a bit far and it cannot be effective to encourage the residents for eating and impassion their olfactory. The area of kitchen has been shown in Figure 45-47.

Figure 45: The Plan Showing the Kitchen in Halk Vakfi

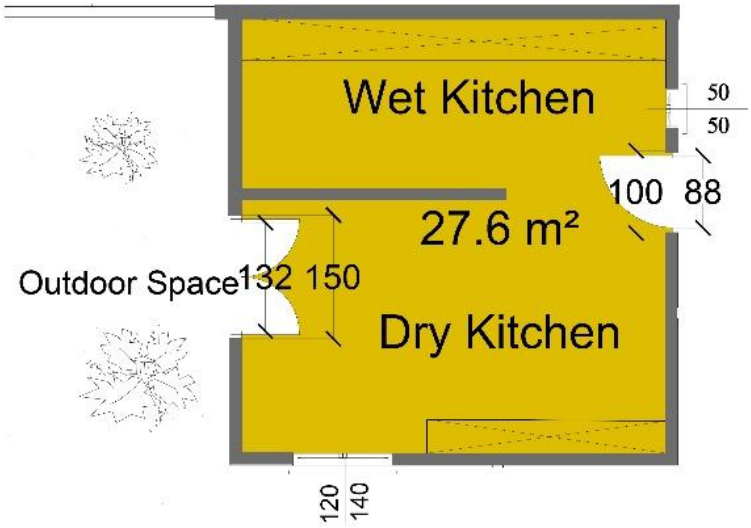

Figure 46: Halk Vakfi Kitchen Plan

a)Dry Kitchen

b)Wet Kitchen

Figure 47: Halk Vakfi Kitchen Space

- **Dining room**

As it is mentioned formerly, dining area is placed within the living area near to the residential part and far from kitchen. This area provides views to the outdoor landscape, and it is big enough to accommodate more than 25 residents as it is presented in Figure 48.

Figure 48: Halk Vakfi Dining Room.

- **Staff Room**

Staff rooms located just after the entrance hallway between two residential clusters. Staff rooms occupying two different rooms. Staff rooms located in a good junction point which they can easily monitor residential spaces and corridors. One is servicing as a caregiver or assistant office embedding toilet and bathroom near to the private bedroom. The staff office room is accessible for all residents, families, and visitors. It is also working as information room. The other staff room is a policlinic containing a small policlinic with two rooms, and a toilet. Nurse office has some lockers and drawers to keep equipment and required stuffs. Door color code is same as the other rooms' door. All given information for staff room are presented in Figure 49-52.

Figure 49: The Plan Showing Halk Vakfi Staff Room.

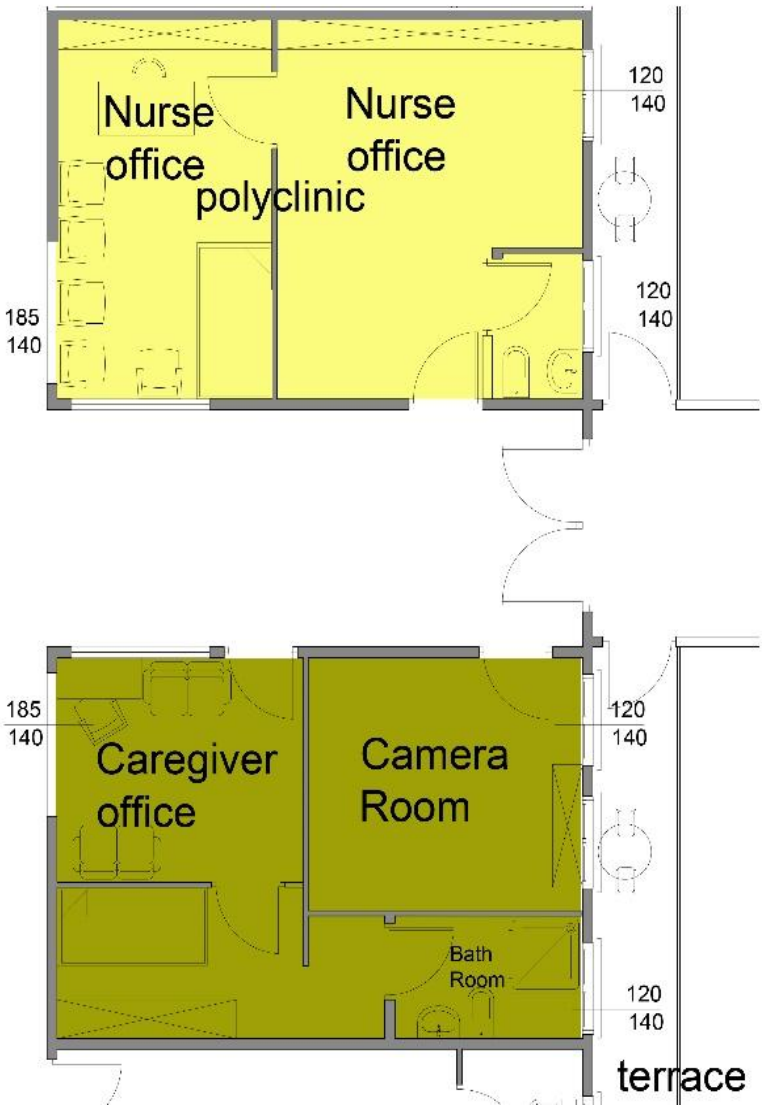

Figure 50: Halk Vakfi Staff Room Plan.

Figure 51: Halk Vakfi Staff Room.

Figure 52: Halk Vakfi Nurse Office (Policlinic)

- **Management area**

As it was mentioned formerly, administrative area situated at East part of the building. Except kitchen all other areas are somewhat related to the management of the Halk Vakfi yaşlılar sitesi. management room, two archive room (including residents' personal information folders, complex expenses, contracts, payments), management office, meeting and gathering area, manager room, bathroom, kitchen, and one storage (related to the extra stuff and cleaning equipment) are shown in Figure 46. Actually, since manager of this building is living there permanently and in this study related spaces named manager home. According to the spatial organization this area is located in a close proximity to the main entrance and hallway. Meeting room (also gathering area for some specific ceremonies) have both a wide, nice

perspective to the outdoor landscape through several openings (windows and glass doors) and south facing elevation. A long terrace inscribes whole right side of the building. Meeting room, manager room, and file storage room has direct access to this area. Administrative area is separated from entrance hallway with two doors with a small foyer in between that are all shown in Figure 53 and Figure 54.

Figure 53: The Plan Showing Halk Vakfi Management Area.

Management office	
Meeting and gathering hall	
Manager home	

Figure 54: Halk Vakfi Management Office, Meeting and Gathering Hall, and Manager Home

- **Sanitary Spaces**

Sanitary spaces include toilets, bathrooms, laundry, and hairdressing room. Bathrooms and toilets are divided into two main groups: 1) staff and management toilet and bathrooms 2) Residents toilets and bathrooms that are shown in Figure 48. There is no private toilet or bathroom for residents. There are only two bathrooms and two bathrooms for residents. The toilets and bathrooms are located in close proximity of resident's bedrooms. There are enough spaces in both toilets and bathrooms for an assisting staff. Unfortunately, they are not well designed for

handicapped accessibilities. The fixtures within these areas are fixed and safe. There is no restroom in exterior landscape. In front of each bathroom there is one storage room including extra wheelchair and equipment. Staffs and manager have their own toilets and bathroom just in their rooms. There is a toilet near to the hallway, adjacent to the gathering area used by staffs and guests are presented in Figure 55-57.

Figure 55: The Plan Showing Halk Vakfi Sanitary Spaces.

Figure 56: Halk Vakfi Residence Bathroom

Laundry Room is located out of the building at exterior landscape. Approximately 24.5 m² is allocated for laundry space.

Figure 57: Halk Vakfi Laundry Space

- **Service Spaces:**

The case study possesses some storage spaces to keep needed stuffs such as housekeeping stuffs, wheelchairs, cleaning materials, and so on. Although these spaces are mostly lockable rooms but the doors are same as the other door colors. Totally there are four servicing spaces and one room (just next to the caregiver's office) allocated for camera room. Service spaces distributed fairly throughout the building. According to the Figure 58 two of them are situated in front of residents' bathrooms and toilets, one is located between two bedrooms at a semi-private space, and one is

located just next to administrative part within the entrance foyer. The width of the door, is wide enough to accommodate stuffs and commuting. According to the site visit the main problem of servicing spaces are lack of classified, sorted shelves to separate equipment accordingly.

Figure 58: Halk Vakfi Services Spaces Plan.

- **Circulation to The Building Main Road**

Circulation is also mentioned as one of the most significant, inevitable factors for elderly home design criteria. In this study, circulation is divided into indoor and outdoor circulation. Indoor encompasses circulations between spaces, hallways, indoor ramp and stairs. Outdoor contains vehicular and pedestrian access to the building and pedestrian accessibility within outdoor landscape itself.

- **Indoor Circulation**

Generally, indoor circulation of case study area is based on two main corridors as it has been shown in Figure 59. Corridor number 1 (C. N1) as it is shown in Figure 60, role as a connector passage between left side of the building (residential clusters, living area (dining room, living room)) and right side of the building (kitchen and administrative area). Staff workstation and policlinic situated within the C. N1, on the other hand, Corridor number two (C. N2) as it is presented in Figure 60, is a main hallway connecting residential clusters to the sanitary spaces, living area, servicing spaces.

It is worth to mention that in contrary to the mentioned examples there is no interior walking loop but the hallways prepared appropriate wide passage for residents. Each resident can achieve to the outdoor space and terraces by entering to C. N2.

Administrative area and kitchen are elevated two steps upper than the other part. Creating a ramp by 12% slope is a bit difficult for handicapped/disabled people to pass through. End of the C. N2, face to emergency fire exit glass opening. All given discussion for indoor circulation has been shown in Figure 61.

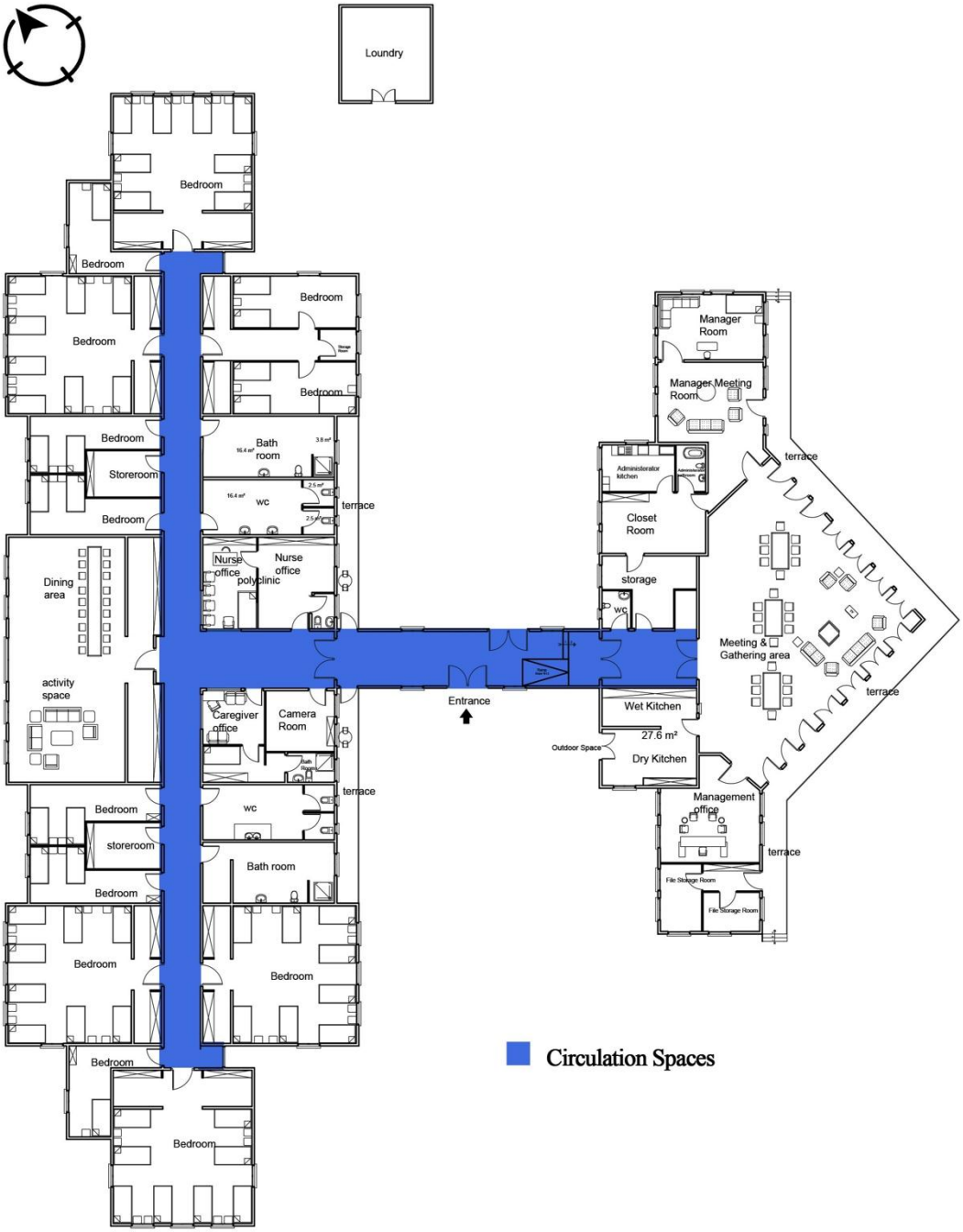

Figure 59: Halk Vakfi Indoor Circulation Plan.

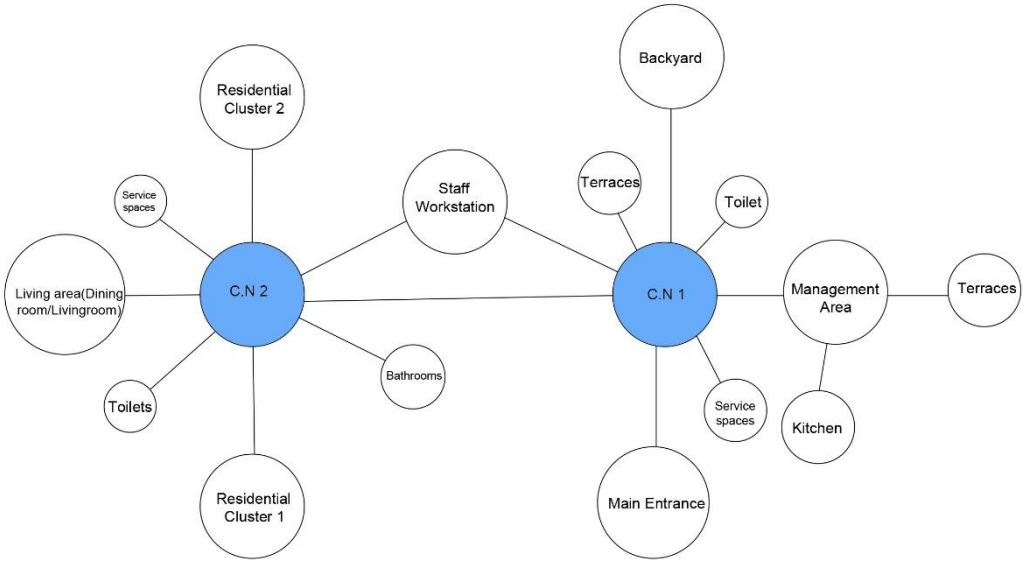

Figure 60: Halk Vakfi Indoor Circulation Diagram

			
Accessibility to residential cluster	View from indoor to outdoor	Accessibility to the toilets and bathrooms	
			
Accessibility to corridor		Accessibility to terraces	Accessibility from indoor to outdoor

Figure 61: Halk Vakfi Indoor Circulation

- **Outdoor Circulation**

Outdoor spaces contain terraces, parking area, pedestrian, outdoor picnic area, and greenery spaces. laundry room is also located out of the building at backyard. According to the Figure 62 although, parking area located outside of the main landscape area vehicular access continues near to the building main entrance and left side of the building for servicing, shipping, receiving materials and fire truck. The pedestrian access to the building has same material with vehicular access (asphalt). The residents access to the outdoor walking loops is feasible through main entrance door and backyard entrance door.

The defined walking loop start just after the site entrance. The west one is going backside of the residential part and the east one is passing through landscape and rich to the picnic area with citing elements and barbeque place. In a likely manner, management part of the building has a long terrace which accessed to the outdoor walking loop but the two other terraces which is accessible for residents through C. N1 doesn't have physical accessibility to the outdoor walking loop. The left walking loop is not connected properly to the right one and create an uneven bumpy field inadequate for disabled people. Pedestrian walkways are properly wide enough for people commuting. Maximum walking loops length is 180 meter (right one from main entrance to the back yard entrance). Nevertheless, by considering a loop whole around the building this amount will reach to 450 meter, situated in walkable distance again That all given information about outdoor circulation have been shown in Figure 56.

Figure 62: Halk Vakfi Outdoor Circulation Plan.

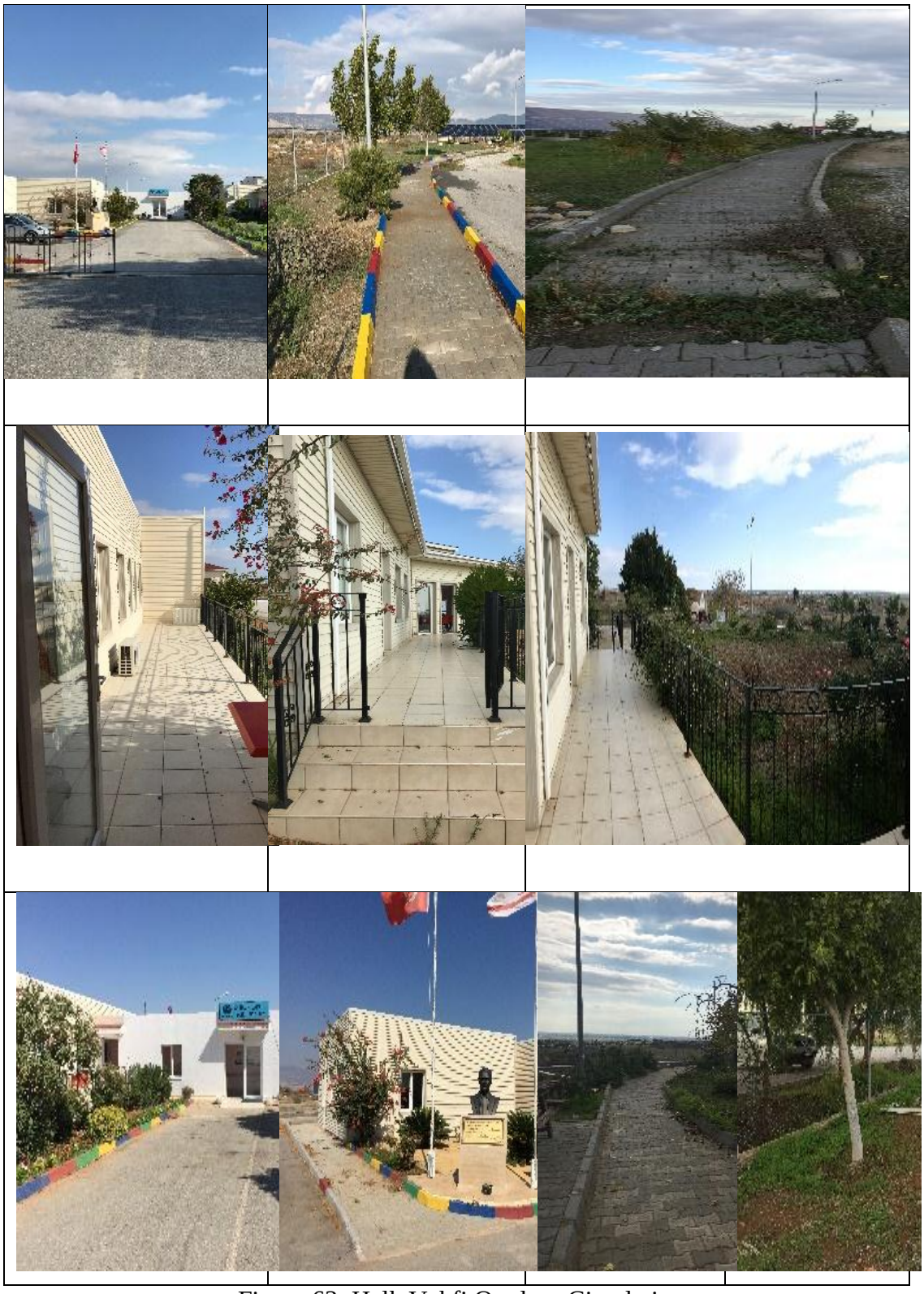

Figure 63: Halk Vakfi Outdoor Circulation

- **Outdoor Spaces**

Halk Vakfi Yaşlılar Sitesi provide some accessible outdoor landscapes for residents but they are not supported by any shading elements, pergolas or other protecting elements from hot sun or reinforce. All terraces are open spaces without any protecting canopy. According to the Figure 63. Although, parking area is located far from main entrance but paving material from site entrance till main UPVC entrance door is asphalt (considering vehicle access instead of special pedestrian pavement. There are no sitting elements throughout the walking loops except picnic area. About the greenery area, site visit showed that dangerous plants like cactus with sharp edges have been planted. Likewise, some areas (specially west part of the site is not enticing and attractive for residents due to both vacant land without special greenery design and inappropriate pavement.

- **Household Comfort**

Household comfort, comprising comfortable indoor temperature, appropriate air quality, adequate lighting and peaceful serene spaces, is an inevitable factor, which directly related to user satisfaction. Except Corridor 1, all building has been built up with sandwich panels. All windows and doors are UPVC frame with double glazing glasses. Indoor temperature of the building is controlled and supplied by air conditioner. Sanitary spaces (bathroom and toilets) together with corridors are not supported by any air conditioner. According to planed interviews with the Halk Vakfi Yaşlılar Sitesi manager, these spaces are suffering from uncontrollable air temperature especially during the winter.

All bedrooms, sanitary spaces, living room, kitchen, dining room, corridors, gathering hall, management area has opening and view to the outside. Likewise, due

to location of the building in a flat ground far away from any building development. This building gains natural ventilation properly.

By considering, the location of the building near to the village and far from city or any industrial can easily conceive that this area is a serene place generally. In addition, according to the Halk Vakfi Yaşlılar Sitesi plan residential area is away from kitchen area, and gathering hall. In addition, this building is one story building and there is no any noise-producing elevator near to the bedrooms. The only noise producing room near to the resident's bedroom is living room and dining room which interview reveal that there is no complains from residents about this issue.

Observations illustrate that Halk Vakfi building is suffering from Glare problem due to both installed reflective flooring and lack of shading elements (specially for resident's bedrooms facing to west side and corridor N.1). Some spaces in corridor suffering from lack of enough lighting.

- **Interior elements**

Interior elements contain interior furniture, interior fixtures, colors, signs, materials, and so on. According to the site visit, all interior doors have same design and same color code and all are one-piece door. At entrances of some bedrooms, there is just a number without any name and visual cues. There is no any personalization material or photos in bedrooms, entrance of bedrooms, and entrances of each cluster. There is lack of enough closet units for the residents in the site. Two residential clusters are defined by same plans, material and area. There is no differentiation of bedroom furniture according to the residents' life background in past.

Generally, according to the elderly home design criteria, walls and floor should have good contrast to be more conceivable for residents but in these healthcare home walls are painted light pink and floor-finishing material is white. Sill height of the window and window's height enable the residents to see outdoor spaces when they are in sitting, standing or sleeping position. Flooring area is covered by anti-slip ceramic tiles, which are easily cleanable. Windows are made up of one fixed part and one casement (flexible) providing approximately 45 cm opening. Foods every day served in 5 times per day and if users need foods, caregivers will support them but there is no sign or sensory cues to attract resident to eat unless when they are preparing food and smell of food is distributed around the living area. Approximately most of the furniture is chosen from flexible and light one which they can easily re arrange it. Glass front cabinet is just located in nurse office and sanitary spaces do not have any locker or drawer That all given information about elements have been shown in Figure 64.

Doors	Windows	Wall and floor color	Spaces Signs & numbers	Furniture	Cabinets closet/ward robe

Figure 64: Halk Vakfi Interior Elements

4.3.2 Analysis of Social factors in Halk Vakfi yaşlılar sitesi

This section investigates social factors related to the elderly houses accommodating also people with dementia. Accordingly, social factors are classified as three sub factors: (1) Safety and security (2) Requirements for staff, and (3) Residents and family interaction.

- **Safety and security**

According to spatial organization within Halk Vakfi Yaşlılar Sitesi staff work station is situated in a good junction point of two residential clusters with wide opening looking to the corridor. Even staff workstation tables positioned face to the corridor openings so that staffs, can monitor residents easily. Although used ceramic tiles within the building and terraces led to provide anti-slip flooring, tiles is not anti-reflective contributing to have glare problem within the surfaces. Grab rails, and handrails are installed one side of the corridors and there are no handrails within the bedrooms and toilets. Bathrooms have enough space for a resident helped by a caregiver but design standards for disabled people have not been considered for them. Fire extinguisher capsules were not placed in a glass fronted boxes and they were left within the corridors near to the wall, which can be perilous for residents. Exterior landscape provides various rough and bumpy ways risky for elderly residents. Walking loops are not well connected and continuous specially the left one. Entrances and terraces are not covered to shelter the residents against intensive sunlight and other precipitation bypass. Corridors, living room, and gathering hall are monitored by security camera. Left side of the building (behind the resident's bedrooms) does not have both, visual accessibility for caregivers and security camera. Outdoor spaces are fully covered by bare metal fences. Previously, design

criteria are pointed out that lighting is a crucial matter within such places where elderly people are living. Lighting either daylight or artificial lighting is not enough in some parts of corridors. At nighttime, especially outdoor spaces, lack of lighting is observed which its limiting residents from wandering and they all have been shown in Figure 65.

Figure 65: Half Vakfi Safety and Security

- **Requirements for the staff**

In this elderly house, a nurse serves 6 days a week from 8 Am to 5 Pm along with eight assistants (two groups of four caregivers) a group work from 8 Am to 5 Pm and other one work from 5 Pm to 8 Am. All trained caregivers have passed some paramedical periods that they can do some first aid helps and injection if needed. Four caregivers support twenty-one residents that means each caregiver have to look after five residents. Republic of Turkey funded one million and six hundred thousand Turkish Liras to build this elderly house and Manager of this building is a woman

(Miss Malek Dogan) who established this building. She already lives there permanently and she supervises and manages all the related issues. She is an experienced manager for more than 25 years and she is familiar with paramedical stuffs.

- **Residents & family interaction**

At the moment, the only activity zone for indoor space is living room with some sitting elements and a television which most of the time is host of residents to gather and do social interactions. Likewise, in front of staff workstation, there are two or three sitting elements for residents to sit. The appreciable fact about the residents and guest interaction is some ceremonies, holidays and social events taking place within gathering hall in administrative part and living room in residential part of the building as it is shown in Figure 66. There are some daily activities planned by caregivers to appreciate interactive involvement of residents such as ironing (in laundry room), weaving (they donate them to gusts and families coming to the complex), and cut/ chop /clean vegetable.

Figure 66: Halk Vakfi Residents and Family Interaction

4.4 Summary of the Evaluations

Halk Vakfi yaşlılar sitesi as the only and pioneer senior care center, designed as an elderly home in Iskele, has been analyzed through various physical and social factors in Table 7 and Table 8 in this thesis. Therefore, in order to understand the strengths and weaknesses of this building design, classified characteristics of senior care center are studied in depth. All the characteristics have been carefully observed and expressed through various tools such as, photos, maps and, personal observation. In the same way, information obtained through interviews has also been used to support the analysis. The achieved evaluations have been summarized in Tables 7 & 8 showing the strengths and weaknesses of the Halk Vakfi yaşlılar sitesi based on defined criteria.

Characteristics				Weaknesses	strengths	General Existing Status	
						Qualified	Not Qualified
Physical Factors	General Building Layout	Location			-Located far from any industrial area.	●	
		Exterior Mass		-Loss of various distinct elements and neglecting interesting façade design. -Building façade does not seem as residential building.	-One-story building, with some openings throughout external façade,		●
	Building Layout & Spaces	Spatial organization	Living Spaces	- Bedrooms area are less than minimum standard except two single ones. -Lack of sitting elements. -There is no any clear features empowering personalization of bedroom. -The used material and finishing for floor and walls does not have enough contrast. -Bedrooms' doors have not enough color contrast with the corridor wall. -There are just two single bedrooms. -There is no direct visual connection from the bed to the toilet.	-All bedrooms have view to the outdoor.		●
				-Kitchen room is not accessible for residents visually and physically. -kitchen is designed as closed kitchen, it is not empowering sense of home-like experiences. - Distance between kitchen and living area is a bit far and it cannot be effective to encourage the residents for eating and impassion their olfactory.	-Kitchen area embedding wet kitchen (washing and keeping dishes) and dry kitchen (cooking and preparing foods). -Having two access one for servicing the gathering hall and one for receiving material and waste disposal. -Having enough space for cooking and storing.		●
				-Not enough feeling of residential space and elements	-It's big enough to accommodate more than 25 residents. -provide views to the outdoor landscape		●
				-The activity space is not well designed by various furniture and different characters. -Not enough feeling of residential space and elements. -There is only one living room. -Residents sometimes use corridor 2 (in front of staff room) as living room. -The only activity considered and encouraged is watching TV.	-Living room has acceptable visibility from staff room. -It is located near to the bedrooms and well accessible. -View to the outside.		●
				-Door color code is same as the other rooms' door. -There is no enough space for all staffs within a room.	-Staff rooms located in a good junction point which they can easily monitor residential spaces and corridors. -The staff office room is accessible for all residents, families, and visitors.		●

Table 7: Summary of the Evaluation for Physical Factors

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Physical l Factors					
Building Layout & Spaces					
Spatial organization					
Service Spaces	**Sanitary Spaces**	**Circulation**		**Living Spaces**	
		Outdoor Circulation	**Indoor Circulation**	**Management Room**	
-Doors are same as the other door colors. -Lack of classified, sorted shelves to separate equipment accordingly.	-There is no any private toilet or bathroom for residents. -They are not well designed for handicap accessibilities. -There are only two bathrooms and two toilets for residents. -Laundry Room is located out of the building at exterior land- scape, and make accessibility hard for staff within the rainy and windy days. -There is no enough space for drying the patient cloths and they use one vacant bedroom temporarily.	-The left walking loop is not connected properly to the right one and create an uneven bumpy field inadequate for disabled people.	-There is no any interior walking loop.	-Not enough toilets for gusts and families.	-Have enough spaces like meeting room, management room, and file storage room are accessible. -Separated from residential part of the building. -Separate toilet from residents for staffs and guests. -Wide view to the outdoor space and whole the area has access to the terrace and ultimately to the outdoor landscape.
		-Outdoor spaces contain terraces, parking area, pedestrian, outdoor picnic area, and greenery spaces. -Parking area located outside of the main landscape area. -The residents access to the outdoor walking loops is feasible through main entrance door and backyard entrance door. -Pedestrian walkways are properly wide enough for people commuting.	●	●	- An existing ramp has 12% slope. - Corridors provide good accessibility to all spaces. -hallways prepared appropriate wide passage for residents. -End of the C. N2 face to emergency fire exit glass opening.
	-There are enough spaces in both toilets and bathrooms for an assisting staff. -Staffs and manager have their own toilets and bathroom just in their rooms.		●		
	-Servicing spaces distributed fairly throughout the building.			●	

Physical Factors	Building Layout & Spaces	Spatial organization	Outdoor Spaces	-Accessible outdoor landscapes for residents but they are not supported by any shading elements, pergolas or other protecting elements from hot sun or wind. - All terraces are open spaces without any protecting canopy. -There are no any sitting elements throughout the walking loops except picnic area. - Left part of the site is not enticing and attractive for residents due to both vacant land without special greenery design and inappropriate pavement. -Planted dangerous plants like cactus. - Access to the building main entrance defined by asphalt rather than any special pavements considering pedestrians.	-Accessible outdoor landscapes for residents -having picnic area sitting elements. -Enclosed garden and large enough to satisfy a need to walk for lengthy periods.		●
		Interior Elements		- All interior doors have same design and same color code and all are one-piece door. -Entrances of some bedrooms, there is just a number without any name and visual cues. -There is no any personalization material or photos in bedrooms, entrance of bedrooms, and entrances of each cluster. -Lack of enough closet units -There is no any differentiation bedroom furniture's according to the residents' life background in past. -No enough contrast between walls and floors. -Casement (flexible) windows providing approximately 45 cm opening. - There is no any sign or sensory cues to attract resident to eat unless when they are preparing food and smell of food distribute around the living area. -Sanitary spaces does not have any locker or drawer.	-Sill height of the window and window's height enable the residents to see outdoor spaces when they are in sitting, standing or sleeping position. -Flooring area is covered by anti-slip, cleanable ceramic tiles. - Foods every day served in 5 times per day and if users need food caregivers will support them. - Furniture's are selected from flexible and light one which they can easily rearrange it.		●
		Household Comfort	Indoor temperature	-Sanitary spaces (bathroom and toilets) together with corridors are not supported by any air conditioner	-All windows and doors are UPVC frame with double glazing glasses. -Indoor temperature of the building is controlled and supplied by air conditioner.	●	
			Air Quality		-Gains natural ventilation properly. -Proper ventilation through the sanitary spaces.	●	
			Controlling of Noise		-Area is a serene place generally. -Residential area is away from kitchen area, and gathering hall. - This building is one story building and there is no any noise-producing elevator near to the bedrooms.	●	
			Lighting Lighting	-Interior spaces are suffering from Glare problem due to both installed reflective flooring and lack of shading elements (specially for resident's bedrooms facing to west side and corridor N.1). -There is no exterior shading elements to control the sunlight specially for the south and west elevation of the building. - Some spaces in corridor suffering from lack of enough lighting. -Lack of appropriate lighting within outdoor spaces during the night time.	-Wide enough windows invite natural lighting to the most of interior spaces.		●

Table 7: Summary of the Evaluation for Physical Factors

Characteristics		Weaknesses	Strengths	General existing Status	
				Qualified	Not Qualified
Social Factors	Safety & Security	- Flooring tiles are not anti-reflective contributing to have glare problem within the surfaces - There are no any handrails within the bedrooms and toilets - Design standards for disabled people have not been considered within bathrooms and toilets - Fire extinguisher capsules were not placed in a glass fronted boxes and they were left within the corridors near to the wall - Exterior landscape has various rough and bumpy ways risky for elderly residents - Entrances and terraces are not covered to shelter the residents against intensive sunlight and windy air - Left side of the building (behind the resident's bedrooms) does not have both, visual accessibility for caregivers and security camera. - Outdoor spaces is fully covered by bare metal fences. - Lack of sufficient light in outdoor spaces during the night time - Lack of artificial and natural lighting within some spaces at corridors -There is no any installation of shutter doors over vanity mirrors, which can be closed if necessary - Lack of any Secure emergency exit doors with an electric deadbolt	- Used anti-slip flooring ceramic tiles within the building and terraces - Grab rails, and handrails installed one side of the corridors - Corridors, living room, and gathering hall are monitored by security camera. - Screwed-type shower and sink drain cover plates - Existing of hot and cold water within 24 hours - Cleaning products, medicines, delicate electronics and certain utensils are stored safely away for the residents' protection.		●
	Residents & family interaction	-There is no any special assortment of designated activity spaces that can support different-sized groups except one living room	- Some ceremonies, holidays and social events taking place with in gathering hall in administrative part and living room in residential part of the building. - There are some daily activities planned by caregivers to appreciate interactive involvement of residents such as ironing (in laundry room), weaving (they donate them to gusts and families coming to the complex), and cut/ chop /clean vegetable.	●	

Table 8: Summary of the evaluation for Social factor

Chapter 5

CONCLUSION AND RECOMMENDATIONS

Today, more than 50 percent of individuals living in health care centers in various parts of the world are suffering from different types of dementia. Nowadays most of the senior care centers are designed according to the physical disabilities of the elderly, yet, there is not much attention given towards the people who suffer from Alzheimer's disease in specific. It is crucial to design care centers considering the social and physical needs of patients with Alzheimer's, in order to provide a better quality indoor and outdoor environment for patients, their families and staff who look after them.

Dementia-friendly health care centers should provide an environment based on two main principles. Firstly, as mentioned in the research, it should target to mitigate the nervousness, anxiety and frequently significant outrage that individuals with dementia can feel, by giving a domain that is safe, secure, recognizable and human. Furthermore, it should concentrate on "boosting the nature of individuals' lives; keeping everybody dynamic; concentrating on all that they can in any case do, as opposed to all that they cannot and make it resident centered design.

This thesis has drawn attention to universal design principles, specifically concentration on indoor and outdoor space design. These designed environments should consider the cognitive and intellectual changes of Alzheimer patients and promote their genuine wellbeing and security, give chances to better social

interaction, and bolster utilitarian capacity through significant action and resident's involvement in daily activities.

It is the most widely recognized degenerative mind issue and is defined as a dynamic mental crumbling shown by loss of memory, capacity to compute, and visual-spatial introduction; disarray, bewilderment, confusion, and disorientation. The manner connected with Alzheimer's illness frequently gets to be distinctly unmanageable at home, or a peril to the individual and it is now that most dementia sufferers are relocated to a healthcare center.

Researchers are proposing that anxiety, and stress management and decreasing the utilization of a few prescriptions could essentially fight off crumbling of patients (LaFerla, 2008). The outline of steady environments could assume a key part in stress lessening and along these lines enhance personal satisfaction. This matter will happen by supporting individual's way-finding improvement and encouraging Alzheimer's person to use outdoor spaces, gardens, and wandering through indoor and outdoor spaces. Likewise, a supportive environment provides sensual spaces boosting seeing, hearing, smelling and tactile sensation.

To make these attributes more tangible and understandable a pilot case study was considered for this research. Halk Vakfi yaşlılar sitesi as the only health care center designed as elderly house in Iskele, North Cyprus was surveyed based on specific design criteria. Besides, this thesis aimed to underpin essential guidelines important for the needs of Alzheimer's patients, when it comes to design of indoor and outdoor spaces. Accordingly, the first chapter of this thesis allocated a brief introduction to the subject by specifying the research problem, aims, and research methodology. The

second chapter illustrated the effect of dementia on the patients and their life. The third chapter declared the universal design guidelines and principles, which has to be considered for the senior care centers to boost up the quality of life for people suffering from dementia. Chapter 3 addressed the second and third research questions. Chapter 3 has ended up with the study of two successful examples (senior care centers for people with dementia) around the world to make these principles more tangible. The forth chapter was assigned for the field study. The main set of criteria have been applied and investigated through the field study to clarify the related issues and problems within this senior care center (Halk Vakfi). Existing status of Halk Vakfi based on defined characteristics have been lightened. Chapter four has been summarized in a table to show the strength and weakness of the Halk Vakfi senior care center as an elderly house in Iskele, and to address the fourth research question.

Last but not the least, the following section propose some recommendations to boost the quality of life and amend the existing deficiencies based on the achieved design criteria.

RECOMMENDATIONS

According to the Table 7 the main issues related to the physical factors are located within these sections: bedrooms, living room, sanitary space, outdoor spaces, interior elements and lighting. The administrative part is situated in a qualified status. Likewise, the study shows that there is no noise problem. The other parts also have some negative points, which can be solved if wanted.

Subsequently, following points can be mentioned as curtail recommendations to amend the physical factor weaknesses:

- Increasing the sense of residential spaces within bedrooms, corridors, living room, and dining area by adding some interior elements illustrating residential space (appropriate furniture, bookshelves, applying warm color, photo frames, carpet, …) to increase homey appearance and texture
- Considering the past life of the residents to make their bedroom more personalized based on their interests
- Personalization for entrances of each cluster within the corridor
- Placing two or three specific and different orienting landmarks within the corridors to help the way finding and patient orientation
- Covering (by using wall paper) or coloring the activity room wall, bedroom walls, and corridor wall to increase the contrast between floor space and walls
- Altering the bedroom's door color to highlight its difference from the other rooms
- Specifying one another room (which is already vacant) to define some new distinct activity area
- Adding some photos or visual signs beside the numbers at entrance of each room
- Bedrooms intensively need wardrobes/closets with two compartment if possible, one part for seasonally and daily clothes and the other one for storing unnecessary clothes.

- Connect the left walking loop properly to the right one and create an uneven bumpy field appropriate for disabled people

- Changing the ground material of outdoor entrance way to the building to make it more homey texture rather than asphalt and to specify starting point of walking loops by extending the designed pedestrian to the building

- Prepared some classified, sorted shelves to separate equipment accordingly within the store rooms
- Installing some exterior sitting element for the outdoor landscape during the walking loop
- Designing some pergolas, shading elements or canopy for both outdoor landscape, and terraces
- Defining more greenery, activity area, and applying some landscape designs to make left part of the outdoor space (west of the building) attractive and enticing
- Due to the social factors summarized in table 8, safety and security part missed a lot of points and need some reconsiderations, as well as, improving resident's interaction and boost their activities:
- Installing anti-reflective flooring tiles or anti-reflective laminate flooring to decrease the glare problem and also increase residential quality of the building
- Installing handrails within both bathrooms and toilets based on standards
- Place the safety equipment like fire extinguisher in glass fronted boxes
- Improve the quality of exterior landscape
- Supporting entrances and terraces by some canopies to shelter the residents against intensive sunlight and windy air

- Add security cameras at outdoor space also to unobtrusively monitor the residents
- Covering the exterior fences by some greenery and plants
- Add more lighting elements at outdoor spaces
- Increase the artificial lighting within the interior spaces specially corridors
- Installing secure emergency exit doors with an electric deadbolt
- Allocate some more spaces within indoor and outdoor spaces for activity zone to support different-sized groups with different level of privacy
- Activity zones has to be designed by consideration of resident's customs

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