WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 8, Issue 1, 1301-1313. Research Article ISSN 2277– 7105

EVALUATING THERAPEUTIC LANDSCAPES: AN APPROACH TO DESIGNING HEALING GARDEN FOR ALZHEIMER'S PATIENTS IN ANTALYA, TURKIYE

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Article Received on
17 Nov. 2018,
Revised on 06 Dec. 2018,
Accepted on 27 Dec. 2018
DOI: 10.20959/wjpr20191-13987

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ABSTRACT

The aim of the study was to prepare a landscape design project for Alzheimer's patients in a specially reserved area in Dosemealtı district of Antalya province, in Turkiye. The SWOT analysis have been used for assessment of reserved area. The evaluation with determining suitability of this area was made under the Landscape Architecture discipline. The projected area looks like appropriate in terms of creating or projecting a healing garden for Alzheimer's. The location is far enough from the city center (25 km away). Around this area, there is a mountain view with a maquis area. The design project has a single entry and/or exit door to the garden with a simple road system. The garden consists of a one-piece road with a limiting coating on its edges. In addition, it is ensured that patients can walk without worry and minimize the possibility of harm to themselves or others. In the gardens to be arranged for Alzheimer's patients, the structural and plant materials are important for the improvement of the patients, feeling themselves comfortable and peaceful, receiving positive energy and effective use. It is important to have a sustainable design in such gardens. Hence the garden is protected from the sun and the wind and enlightenment is provided by using lighting elements. The non-poisonous and non-toxic plants have been recommended for this therapeutic landscapes project.

KEYWORDS: Landscape Architecture, garden design, plant material, Alzheimer's, Antalya.

1. INTRODUCTION

As a result of the increase in longevity, the disruption of the behavior of the elderly has become a problem in the society. Alzheimer is one of the most common form of dementia that a progressive decrease in cognitive function. The American Psychiatric Association defines Alzheimer's disease as *'it is an age-dependent and irreversible disease that the presence of many cognitive disorders, including impairment of consciousness'*.[1] In the early stages of the disease, the patient; self-care such as bathing, feeding, dressing are decreasing. However, in the later stages of the disease, some physiological losses, behavioral changes, depression and agitation are usually observed.[2]

Although the significant advances in medical science and increasing living standards, the cause of Alzheimer's disease has not been fully elucidated and patients are not fully recovered.[1-3] Since there is no definitive treatment of Alzheimer's disease, two general methods are used, namely the pharmacological and non-pharmacological method to slow the loss of the patient's cognitive abilities.[4,5]

However, green environment and colorful gardens could be offers a meaningful activities with providing physical exercise, opportunities to relieve tension, frustration and aggression of users. Therefore, therapeutic landscape design is important to figure of creating a sense of healing and community of gardening with others. Moreover, these specially designed places could also be provided stimulation with color, smells and sounds of wildlife that time outdoors in a safe place and personal space for reflection and privacy.[6,7]

A number of scientists have already conducted some studies on healing garden designs properties and benefits to user. Consistently, they reported that especially well designed gardens with landscape elements could be part of a treatment plan and allow people with engages all of the senses. At the same time, a well-organized garden helps Alzheimer's patients rediscover their worlds.[3-10] A well-organized garden provides a variety of mental and physical benefits to the elderly, including Alzheimer's patients, as well as creating a beautiful place to spend time and enjoying the wonderful views outdoors. Thus, it helps the user to feel their favorite flowers, fruits or fragrances.

It has already well established by numerous scientists' that plants are highly effective elements on the success of landscape design and those could be increased with some points to be taken into account with creating flexible composition by benefiting the user.[11-13] The

garden concept could be more related to mental health services due to its nature for elderlies. It is important to note that the gardens are not therapeutic alone, but its near environment could be a healing effect as well.[5,6,14-17] However, the quality of a healthy and balanced aesthetic landscape design depends on compliance. In this sense, a healing garden should follow universal rules as both design and purpose. Plantations, architectural elements and design structures should come together in the garden, and able to give a sense of improvement with positive sensory stimulation and therapeutic environments emerge.[4,14,15]

Although there is no fully treatment method at present, a better quality of life for Alzheimer's patients is to preserve existing functioning levels for as long as possible. However, it was observed that very limited number of studies have conducted in landscape discipline in terms of specially design garden and its near environments for Alzheimer's patients in Turkiye. Therefore, this study is aimed to study the preliminary landscape elements required for the Alzheimer's patients and to improve the quality of life and to reduce the difficulty of care for patients, caregivers and families. In addition, comprehensive observations were made and a design project for Alzheimer's was prepared in a selected area of Dosemealtı district of Antalya province, with based on literature information's within the scope of landscape architecture design principles.

2. MATERIALS AND METHODS

The material is a specially reserved area for Alzheimer's patients whose some healing effects could be possible for the most suitable sustainable garden design in the view of landscape architecture discipline. This design area is located in Dosemealtı district of Antalya province, Turkiye. It is one of the central districts of Antalya which was established in 2008. Its population is 58, 250 and approx. 25 km away from the central settlements (city center).[18] This selected land is mostly consist the natural environment that away from many city elements (noise, crowding, residential and industrial structures). However, the north side has mountains (Taurus mountains), the south side has highway, the east side has residential buildings and the west side has natural forests (mostly shrubs). The locational properties and aerial photograph of these reserved area shown in Figure 1.

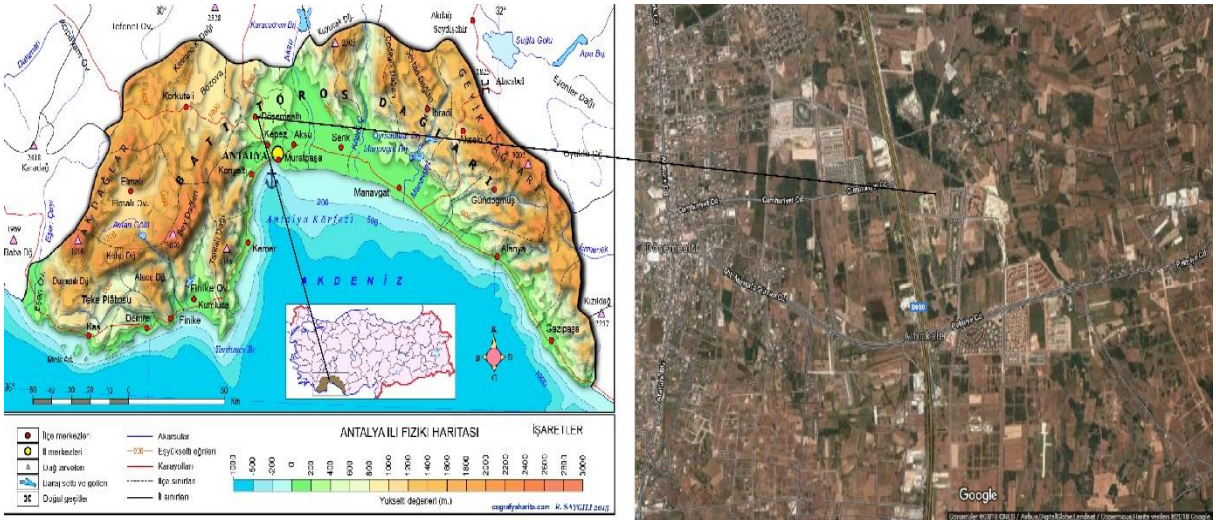

Figure 1: The locational properties of healing garden for for Alzheimer's.[19]

For determining suitability of these area for Alzheimer's in terms of creating a therapeutic landscape place, the SWOT analysis have been used for assessment of land. However, SWOT analysis (Strengths, Weakness, Opportunities, Threats) is well known approach to used to evaluate a lands or areas competitive position by identifying its strengths, weaknesses, opportunities and threats. Specifically, SWOT analysis is a one of the important assessment model that helps to decide specific works and its potential opportunities and threats.[20] In this sense, following SWOT analysis for that selected area determined and given in Table 1.

The study was conducted in Januray 2018 throughout September 2018 in order to suitability of environmental analysis, design principles and construction processes for Alzheimer's diseases. The need and demand on this potential healing garden specification and basic elements have been determined. In this regard, incorporating visual analysis of the site and systematic information gathering through literature review were employed.

Table 1: SWOT analysis for selected area of Alzeheimer's patients in Dosemealtı district, Antalya.

Strengths	Weaknesses	Opportunities	Threats
The project area is far from the city center.	There is a growing interest for housing around selected area.	Selected area is away from city noise and pollution.	The forestry lands may require care against creatures.
There is forestry lands (schrub) around land.	There is no any hospital or other health facilities.	There is a beautiful natural view.	There is an industrial zone where not very far away.
There is a mountain landscape view.	Lack of parking spaces.	Topographic structure of the area is suitable for that project.	There is a highway just 500 m away from selected area.
There is a natural barriers for windy wheather.	Lack of social gathering areas.	There is enough vacant land for reserving park or social facilities.	The projected garden's door opens to residential area.

3. RESULTS AND DISCUSSION

As mentioned above, unlike other diseases and chronic conditions, drugs that slow the progression of Alzheimer's, but nothing could completely stop or reverse the disease. However, thanks to landscape practices and garden elements could be modified to be improve philosophical thoughts for Alzheimer's.[7,10,12,14]

Figure 2 shows general locational photographs of selected area. It has found that there are no any heavy residential or industrial buildings (Fig. 2A-F). However, some natural landscape view and forestry (shrub) area west side of land (Fig. 2A).

Figure 2: General view of study area (A: West side of area, B: East side of area, C: North side of area, D, E, F: Residential buildings around study area).

This selected area looks like useful for creating **t**herapeutic landscapes including a healing garden model for Alzheimer's patients. It has observed that the area is far enough from residental structures, city centers, crowdings, unwanted noises while a mountain landscape view and some natural barriers for wind so on. On the other hand, this area also easily accessible by friends and family visits by providing easy and secure transportation to reach around Antalya provinence. However, its location has advantage to protect these Alzheimer's from many thinks that just construct fences or walls around the garden with covering trees and shrubs so that patients do feel comfort in unit. Moreover, the garden design project should be promoted social interaction, learning, movement and independence without creating stress or unintentional distraction.

The climatic conditions is also very important for design process. Figure 3 shows wheather properties of Antalya city throughout year.[21] It looks like Antalya city has very mild climate conditions. July looks like the hottest month with an average temperature of 28°C and the coldest is January at 10°C (Fig. 3A) with the most daily sunshine hours in July as well (Fig. 3E). The wettest months is December with an average of 210 mm of rain (Fig. 3D).[21] The sun and the wind throughout the four seasons of the year should be consider and necessary placement should be made. Consider daylight, too much light reflection or dark areas are not helpful to older people who can have problems with their sight that degenerative eye conditions are usually common in old age. Therefore sunny and shady sheltered spaces and areas protected from wind and rain should be considered together in this selected area.

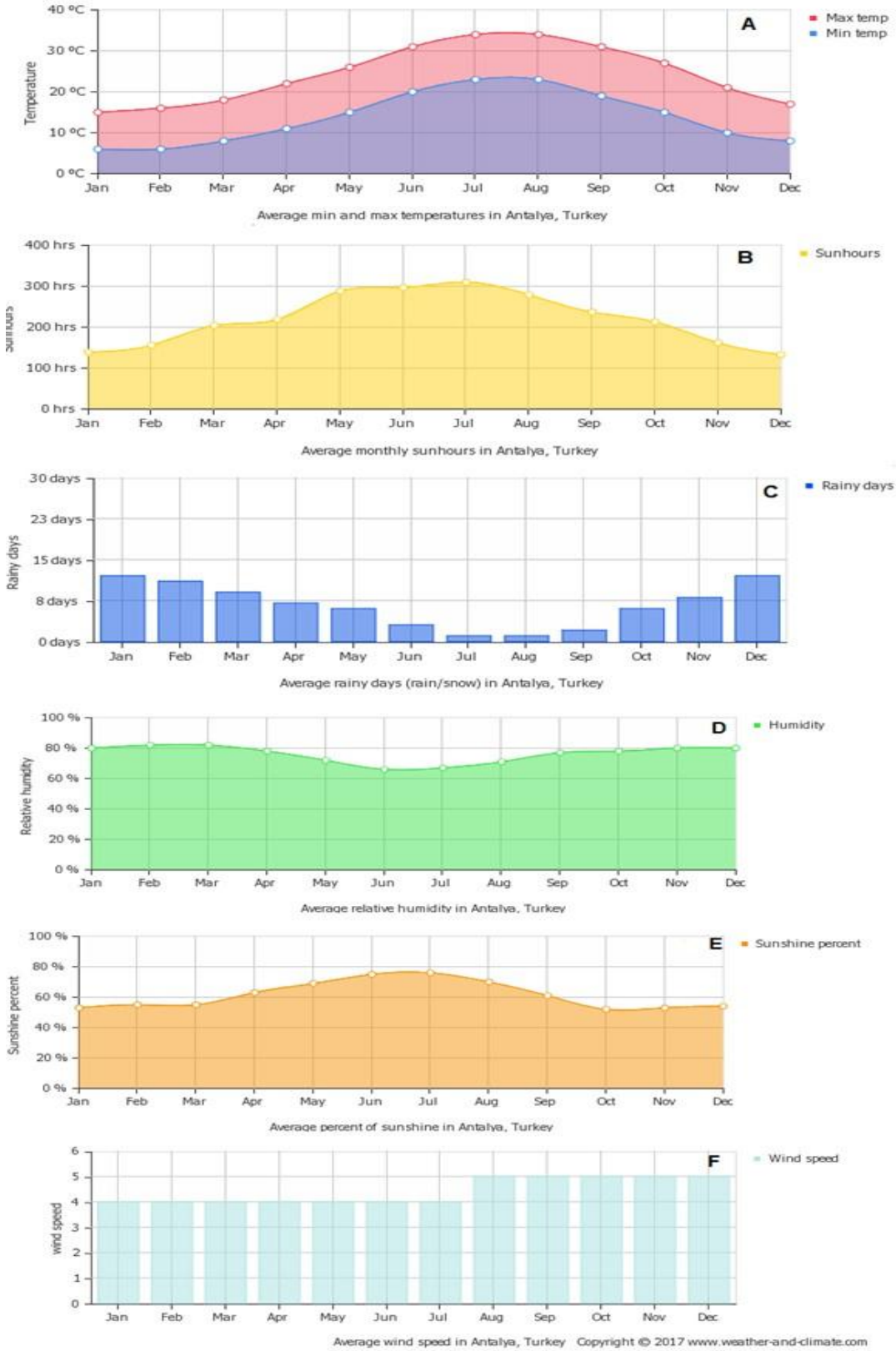

Figure 3: Atmospheric properties of Antalya city (A: Annual temperature distribution, °C; B: Monthly sunny hours; C: Annual average rainy days; D: Annual realtive humidity distribution; E: Monthly sunshine precent; F: Monthly average wind speed, m/sn).[21]

Alzheimer's patients tend to go without purpose, so all patient-accessible external doors of all complexes should be designed to open up to the inner courtyard. Hence, there should be a single entry and/or exit door to the garden with a simple road system to help patients with spatial perception problems. However, the courtyard should be one-piece paths and that it is designed as a limiting pavement at its edges, enables patients to walk without worrying about traveling**.** The rear courtyard of care unit could be considered as suitable areas for patients and visitors seeking privacy and loneliness. The crutches and wheel chair patients need to be determined according to the shape of the path for the distance between the way. In addition, slightly sloped transportation should be provided by creating a ramp instead of high stairs. The design, surfaces and elements should be aimed to minimizing the harm to patients or others. The minimum movement and dimensions on the sidewalks for different users, especially those with mobility difficulties, should be standardize dimensions.

In the garden, it is very important to consider the garden that should include sloping walls, flower beds, containers and retaining walls that accessible at different heights. However, a well design garden should cater for the able-bodied as well as those who have problems with mobility. The garden design should also include some shelter from the sun and the wind, such as a gazebo. Moreover, garden for Alzheimer's or dementia group should allows access outside but always leads the wandering person back to their house or building.

Studies investigating that the anxious behavior of people with Alzheimer's disease has been found to be significantly reduced when they are in an environment with constant light levels, rather than with varying light levels.[1-4] Therefore, instead of the intense and disturbing lighting that should be directly on the patients, shade effect could be provided by using light and low illumination elements to the water and road sides. However, walkways and pathways should be wide enough, smooth without steep gradients or steps. This could keep Wheel chairs from rolling into lawns or landscape beds,

It has recommended that the garden should have the shape of a figure eight looped path, or similar, simple returning-path system that as dead-end gardens can cause confusion.[1-3] However, the dark, shadowy areas or galare should be avoided due to visual spatial changes, people with Alzheimer's or other types of dementia could mistake darker or glare areas for holes or similar obstacles. Moreover, the garden should be not including any sharp gardening tools. In addition, some seating elements such as benches along the paths should be placed to allow places for rest and enjoyment of the beauty seeing.

In the selection of plants, care has taken to have four seasons of flowering and fragrance. However, the water object on the edge of the garden could calms the patients The non-poisonous and non-toxic plants should be preferred in that specific areas. Otherwise, these poisionus plants could harm people if they eat, touch or smell that could caused skin rashes and irritation. Moreover, some raised planters should be placed approximately of the height of a wheelchair so that gardening is more accessible and enjoyable. Although bushes and trees provide structure and direct movements, perennials should also be preferred due to easy of care and not need to be replace each year. In addition the flowers should be fill throughout garden with placing some herbs, lavender and other plants. In this regard, when the plants brushed, flowers' may release their fragrance.

Sensory stimulation is also important issues to be consider for creating garden for Alzheimer's. Therefore, attracts of human's sensory organs could be beneficial for improving physiological properties of elderly people. In this sense, seeing a movement objects on water or various shape plants, hearing water noise, smelling plants, flowers, touching various shape of plants, taste fruits or some edible plants are all helpful for elderly and Alzheimer's, However, the plant composition should be created to appeal to the eye and smell senses by using plants that have been blossomed and have pleasant odors throughout of the year. The potentially useful plant materials for healing garden for alzheimer's patients have been listed in Table 2. These plants carefully selected for garden design in terms of their color, texture and form. Hence these materials considered to be helps to understand the environment and gain importance from the sensory point of view and preferred to calm the patients.

After site visits and observations, SWOT analysis, the literature suggestions and information's on Alzheimer patient's needs and demands, a landscape healing garden design project have been prepared as seen in Figure 4 and perspective, sketch drawings in Figure 5.

Table 2: Some plant materials that useful for Alzheimer's patients.

Scientific name	Common name	Scientific name	Common name
Laurus Nobilis	Laurel	*Mentha piperita*	Peppermint
Citrus sinensis	Sweet orange	*Salvia officinalis*	Culinary sage
Lagerstroemia indica	Crape myrate	*Vitis vinifera*	European grape
Lavandula officinalis	Lavender	*Equisetum arrogance*	Horsetail
Mrythus communis	Common myrtle	*Viola sp*	Violet
Hibiscus rosa-sinensis	Japanese rosa	*Dichondra repens*	Creeping dchondra
Calendula officinalis	Common marigold	*Hedera helix*	English ivy

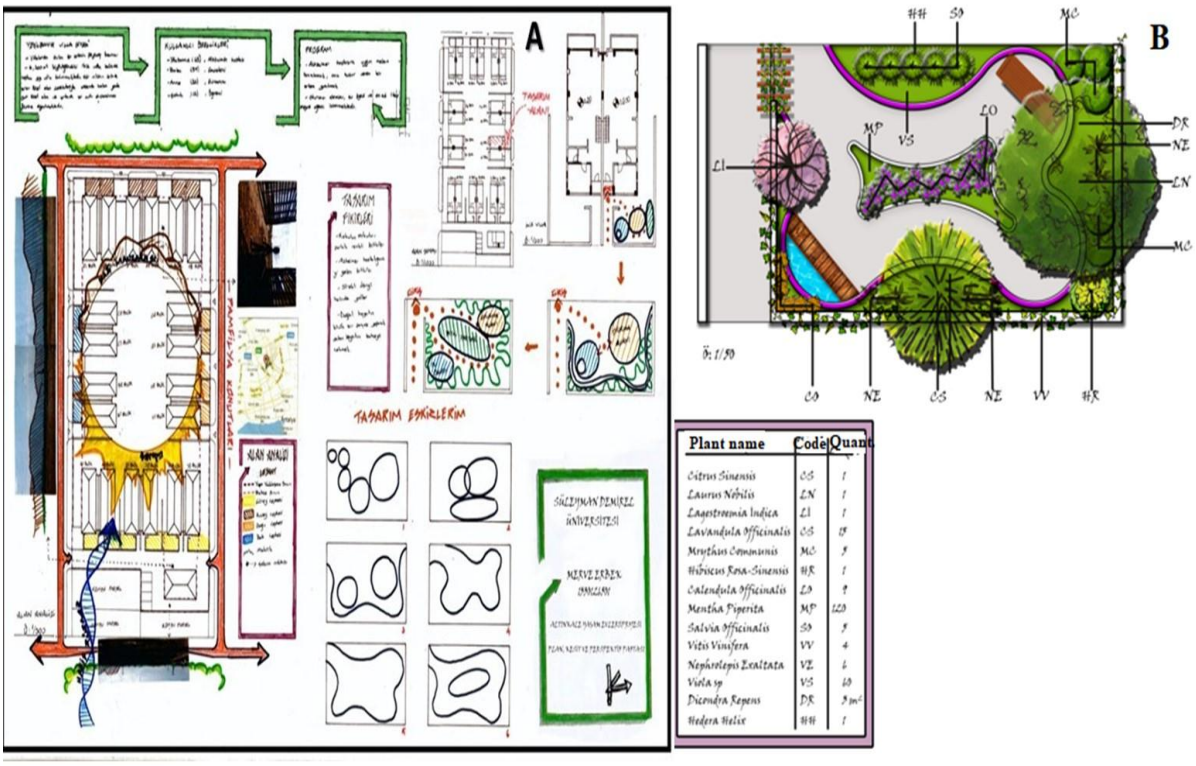

Figure 4: Landscape plant design project for Alzheimer's patients (A: Field analysis sheet, B: Plant design).

Figure 5: Persfective, sketch drawings for design project.

4. CONCLUSIONS

Alzheimer's patients initially require remote observation, but as the disease progresses, they are completely in need of care. However, gardening therapy is one of the great ways to be active and out of the house, and a great opportunity to spend time with Alzheimer's disease. Besides physical activities, memory exercises and personalization are also necessary for these patients to therapy and to do something they may engage in, to communicate and to chat, to create a fun atmosphere for them to enjoy, to show that they are valued as an individual and to their life stories. These creates a mutual interaction environment within the group, decreases social isolation and increases mental well-being. The garden design for Alzheimer's should be aimed to.

- It should be offered some physical exercises that offers opportunities to relieve tension, frustration and aggression,
- It should be having some meaningful activities,
- It allows the patient to look at flowers and other plants,
- It should be provided personal spaces for reflection and privacy and outdoors time in a safe place,
- It should be provided stimulation with color, smell and wildlife sounds.

  All of these could be improved by using therapeutic landscape approach to design healing gardens for Alzheimer's or dementias.

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