



Nursing Home Design with a Biophilic Architectural Approach

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Abstract. *Older people sometimes become a new problem for a family or government. These problems are the unavailability of access to health care, the lack of old age insurance, and the social support from the family to care for them. The aging process certainly has an impact on all aspects of life, especially health because with increasing age, the function of the body's organs will decrease both due to scientific factors or disease. The decreased function of the body's organs makes the elderly limited in carrying out activities because of the limited energy they have. Through the design of the Nursing Home with the Biophilic Architecture approach, it can help the elderly from feeling lonely and so that their illness does not get worse and it is hoped that they can recover and continue to carry out more productive activities. So this design can be a social space for the elderly who are able to respond to the conditions and activities of the elderly.*

Keywords: *Elderly, Nursing, Caring, Biophilic-Architecture*

1. INTRODUCTION

Elderly is people who has reached 60 (sixty) years old and above. [1]. Elderly people experience decline in various aspects of life, then there will be physical, mental and psychological changes. Biologically, the symptoms include slowed thinking processes, reduced memory, changed sleep patterns, the body can no longer function properly which results in the elderly only being able to stay at home for reasons of age and without being able to do anything because of the limited energy they have. [2].

The existence of neglected elderly population reflects that the family as the closest environment of the elderly can't provide good social support. There are several reasons why families can't provide social support for the elderly, including poverty, family values, busy work and inability to care. [3].

Elderly is a natural process called a degenerative process. At this stage, the elderly have difficulty getting through their old age, because some people think that the elderly can't do anything or are useless. The older the age that occurs through the natural process in the elderly, the more dependence experienced by the elderly. This is due to the decline in physical, psychological and social conditions so that the decline experienced by the elderly will slow down the interaction process that occurs in the environment. [4]. The family has an important role in caring for elderly parents and helping them in carrying out their daily needs. [5].

However, along with the development of the increasingly modern world, more and more pressure is given to couples and children who have their own busy lives, resulting in

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children getting less attention and their parents rarely talking to them. The condition of the family caused the family to start entrusting elderly parents to nursing homes. [6]. The existence of a nursing home actually has many benefits for the elderly and the surrounding community. Nursing homes can help families who have to divide their time between being busy with their work or caring for their parents, and can provide opportunities for elderly residents to meet friends of the same age and do productive activities. [5].

2. LITERATURE REVIEW

Nursing Home

Nursing Homes are the Government's efforts to protect the Elderly (senior citizens) who live in poverty and are neglected. Constitution 1945 article 34 Constitution has mandated, paying attention to "Poor and Neglected Children". The establishment of Social Homes is based on Law of the Republic of Indonesia No. 4 of 1965 concerning "Provision of Life Assistance for the Elderly"; Decree of the Minister of Social Affairs of the Republic of Indonesia No. 3/1/50/107/1979 concerning "Provision of Life for the Elderly"; Law of the Republic of Indonesia No. 6 of 1998, concerning "Elderly Welfare" [7].

A nursing home is a place for the elderly as an alternative place to live for those with special needs that provides services and care as well as various activities that can be used by the elderly to overcome physical and mental decline together in the community. [8]. A nursing home is a technical implementation unit that provides social services for the elderly, namely in the form of providing shelter, life insurance such as food and clothing, maintenance, health, filling free time including recreation, social, mental and religious guidance, so that they can enjoy their old age with inner and outer peace. [9].

Nursing homes have the purpose of accommodating the elderly, providing them with special care and services under the supervision of nurses and social workers[10]. The main roles of nursing homes are:

- a. Nursing homes as centers for elderly welfare services (including the provision of basic needs);
- b. Providing the elderly with a physical location and opportunities to participate in social and recreational events.
- c. Providing the elderly with the opportunity to age peacefully without sacrificing their health or independence. [11].

On the other hand, nursing homes are tasked with ensuring the welfare of their residents in accordance with all applicable laws and regulations, in addition to providing social services and social rehabilitation. [12].

Nursing homes are identical to shelters for the elderly. The categories or characteristics of parents who are accommodated by nursing homes are those who are alone and have no relatives who can care for them. In nursing homes there are officers or volunteers who can accompany and care for them through their old days, and those who still have relatives or even those who still have children and grandchildren but cannot care for them. [13]

Nursing homes primarily serve healthy and independent elderly people who do not have homes and families or whose families are unable to care for them. The existence of nursing homes is also expected to reduce the elderly who are neglected and meet the needs of the elderly to improve elderly care. The ability of social workers to provide certain services is regulated by Constitution No. 13 year 1998, which discusses the welfare of the elderly. In terms of the welfare of the elderly, it is essential that not only their basic needs, but also the unmet needs from the time they spend away from their families in institutions should be met through the various service networks that exist. According to the Strategy and Program for Social Services for the Elderly in Indonesia. [14].

There are two approaches to dealing with the elderly population: institutional care and non-institutional care. In addition to basic needs such as food, clothing, shelter, medical care, and spiritual/psychological guidance, nursing homes also offer activities such as sports, hobbies, and outings to help residents pass the time. [15]. Services for the elderly outside the shelter allow the elderly to live with their families and receive food assistance and empowerment in the field of Productive Economic Enterprises (UEP) through an institutional approach as a social investment and a means to help underprivileged elderly. [16].

Biophilic Architecture

Biophilic architecture is the crystallization of three principles of green architecture. “respect for user, respect for site and energy efficiency” [17]. Biophilia is the inherent human tendency to be at one with nature that even in the modern world is becoming essential to people's health and well-being both physically and mentally. [18].

The values in biophilic design according to Kellert are [19]

Table 1. Biophilic Values

No.	Biophilic Values
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1.	Utilitarian Values	Making nature a source of passive physical and material utilization.
2.	Naturalistic Values	Making nature a source of stimulation, detail and diversity.
3.	Scientific Ecological Values	Using the function of nature as a source of knowledge.
4.	Aesthetic Values	Emphasizing using nature as a source of beauty.
5.	Symbolic Values	Emphasizing the tendency of nature as a medium of communication in thinking through language and living symbols.
6	Humanistic Values	Emphasizing the emotional bond of humans to the elements of natural life.
7	Moralistic Values	Emphasizing the moral and spiritual relationship with nature.
8	Dominionistic Values	Emphasizing the desire to master and know nature.
9	Negativistic Values	Emphasizing attitudes of anxiety and worry towards nature.

Biophilic architecture has several benefits, namely it can reduce the stress levels of occupants, increase creativity and stabilize the mind, improve well-being and accelerate healing. Biophilic design also facilitates reciprocal interactions between humans and nature, as well as living systems to improve the quality of life of users. "14 Biophilic Design Patterns" published by Terrapin Bright Green, articulates the relationship between nature, human biology, and the design of the built environment [20]

Table 2. Biophilic Design Patterns

Nature in the space	Natural analogue	Nature of the space
Visual Connection with Nature	Biomorphic Forms and Patterns	Prospects
Non-Visual Connection with Nature	Material Connection with Nature	Refuge
Non-Rhythmic Sensory Stimuli	Complexity and Order	Mystery
Thermal And Air Flow Variability		Risk/Peril
Presence of water		
Dynamic and Diffuse Light		
Connection with Natural Systems		

The biophilic approach is applied by selecting appropriate vegetation, zoning the outdoor activity area on the east side, and orienting the eastern mass to maximize the benefits of morning sunlight and wind as a source of natural lighting and ventilation..

Visual Connection with Nature

The Visual Connection with Nature pattern has evolved from research on visual preference and responses to views to nature showing reduced stress, more positive emotional functioning, and improved concentration and recovery rates. Stress recovery from visual connections with nature have reportedly been realized through lowered blood

pressure and heart rate; reduced attentional fatigue, sadness, anger, and aggression; improved mental engagement/attentiveness, attitude and overall happiness. [20]

Presence of Water

The Presence of Water pattern has evolved from research on visual preference for and positive emotional responses to environments containing water elements; reduced stress, increased feelings of tranquility, and lower heart rate and blood pressure from exposure to water features; improved concentration and memory restoration induced by complex, naturally fluctuating visual stimuli; and enhanced perception and psychological and physiological responsiveness when multiple senses are stimulated simultaneously. [20]

Theme Implementation

Biophilic seeks to create a good habitat for people as biological organisms in a modern environment that advances society in terms of health, fitness and well-being. Biophilic design also encourages emotional attachment, and encourages positive interactions between humans and nature. Biophilic architecture can reduce stress in users, increase creativity and clarity of thought, improve well-being and accelerate healing. Biophilic design also facilitates reciprocal interactions between humans and nature, and living systems to improve the quality of life of users.

Design Location

The design of this Nursing Home is located on Setia Budi Street, Medan Tuntungan, Medan City. The site area is around 2.2 hectares with a flat contour. The site area has commercial functions and densely populated settlements. This location is very potential because it is located around residential areas.

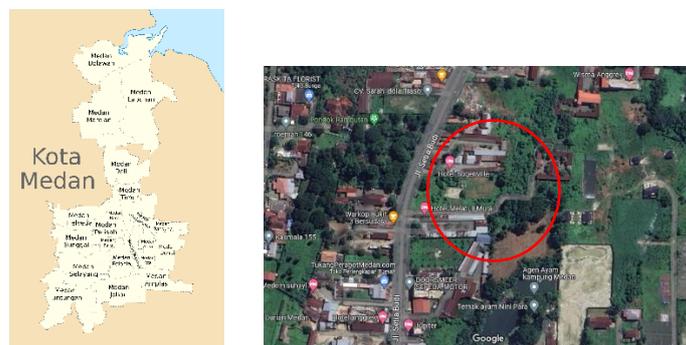


Figure 1. Site Location

3. METHODOLOGY

Data collection using descriptive analysis methods. Collecting physical, non-physical data and conducting observations to the design location, either by direct survey or

datas collection via the Google Earth website. Some data after the analysis results are wind direction; sun orientation; temperature; humidity; access and circulation; land use regulations; applicable building regulations; footprint size; road width; road dividers; road names; sidewalks.

Analysis Results

The purpose of designing this Nursing Home is to provide a place to care for the elderly, for the elderly to socialize and provide complete facilities for the health and comfort of the elderly.



Figure 2. Garden and communal area

Design Concept

The design of this site is divided into three parts. Public areas are areas that can be accessed by everyone, namely, parking, main building and garden. Semi-public areas are areas that can be accessed by residents, nurses and managers of the home, namely residential buildings and private swimming pools. Service areas that can only be accessed by managers of the home.

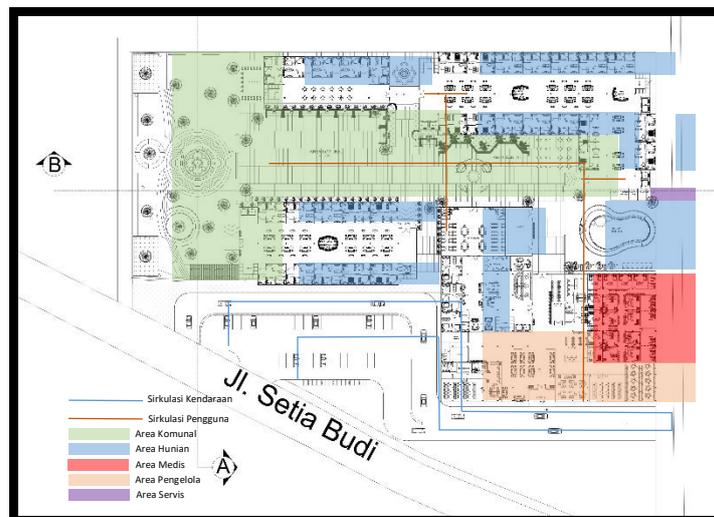


Figure 3. Zoning Concept

There are 2 circulations, namely vehicle circulation and occupant circulation.

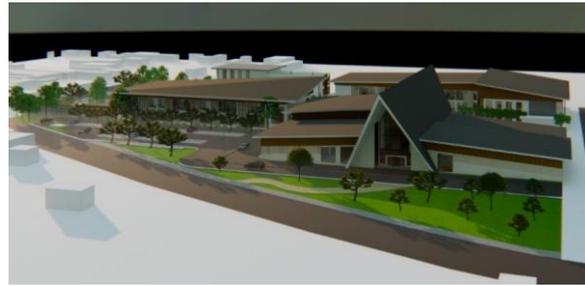


Figure 4. Final Mass

Building Facade Concept

The front facade of the main building uses a roof with a high triangular shape as a marker for the reception area, making it easier for the elderly to recognize the main building.



Figure 5. Building Facade

Building Utility System Concept

Clean water distribution from PDAM sources and rainwater reservoir is first stored in temporary reservoirs (water from rainwater reservoirs must be filtered first before being distributed), then distributed to the reservoir.

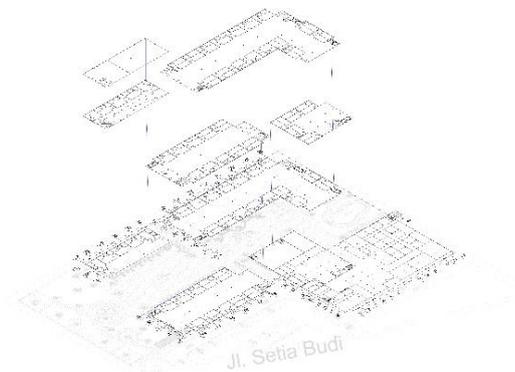


Figure 6. Clean Water Distribution

There are two types of dirty water, namely solid dirty water and liquid dirty water. Solid dirty water is channeled to one zone then channeled to the control tank then to the septic tank. For liquid dirty water, it is channeled to one zone then to the control tank then to the city sewer.

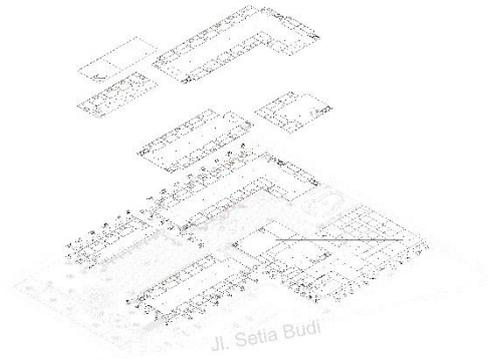


Figure 7. Dirty Water Distribution

4. CONCLUSION

Biophilic creates a good environment for people in a modern environment that advances society in terms of health, fitness and well-being. Biophilic design also encourages emotional attachment, also encourages positive interactions between humans and nature.

The application of biophilic architecture in nursing homes can help seniors reduce stress for residents, increase creativity and clarity of mind, improve well-being and accelerate healing. Biophilic design also facilitates reciprocal interactions between humans and nature, as well as living systems to improve the quality of life for users.

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