The Implementation of Water Presence Aspect in Creating a Comfortable and Healthy Apartment in Jakarta

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Abstract. This paper presents the study improving health and comfortable living space on apartment with water presence implementation. There are 14 aspects on Biophilic, this study will focus on one aspect and its presence of water, this aspect its necessary since water had a lot of function and connection to improving health and comfortable living space. The research method used in this study is a qualitative research method for collecting primary and secondary data which are descriptive, method of collecting data. The technique used to collect the data is a questionnaire, the target of the questionnaire response is the occupants of the apartment around Jakarta. The result of this study shows that dwellers more comfortable with implementation of water presence by seeing and hearing, because of that water presence by touching it’s not recommended for most people in their daily life.

Keywords: Health, Comfortable, Biophilic, Presence of Water, Apartment

1. Introduction

The growth of office buildings in Jakarta made a magnet for people from all over Indonesia to carry out urbanization, thus housing needs are also increasingly high. With the least available land, vertical housing such as apartments are the best answer to meet those needs. Apartment must function not just a dwelling that can provide shelter, but also must be able to meet the level of comfort needed with a decent level of health for the users.

A pilot research was carried out by using online questionnaire. The aim was to identify the reason why dwellers want to live in apartment and what are the disadvantages living in apartment. There was a total of 40 respondents. Based on the pilot research, the reason why they choose to love in apartment was closer distance to workplace, more affordable than landed housing, comfortable, and practical. It was also found that the biggest drawback in apartment is the lack of nature.
Following an architecture guide to the UN 17 Sustainable Development Goals, this research will focused on one goal which is point number 3, which is good health and well-being. Ensuring healthy lives and promoting well-being for all at all ages is important to building prosperous societies. Architecture, simply put, plays a crucial part in creating a built environment that supports good health and well-being. Examples of this span greatly and can be found in housing that increase user’s health.

Biophilic concept was proved to increase productivity, enhance creativity and clarity of thought, improve our well-being, and reduces stress. Biophilic is the practice of incorporating nature and natural elements into the built environment known as biophilic design. Terrapin Bright Green, has distilled research from several fields, including environmental psychology, endocrinology and neuroscience, to develop the 14 Patterns of Biophilic Design.

Biophilic design can be organized into three pattern – Nature in the Space, Natural Analogues, and Nature of the Space – providing a framework for understanding and enabling thoughtful incorporation of a rich diversity of strategies into the built environment. They are as follows [3]:

- **Nature in the Space** Patterns have seven concepts of biophilic which **visual connection with nature**, **non-visual connection with nature**, **non-rhythmic sensory stimuli**, **thermal & airflow variability**, **presence of water**, **dynamic & diffuse light**, and **connection with natural systems**. Secondly there’s **Natural Analogues** Patterns have three concepts and its **biomorphic forms & patterns**, **material connection with nature**, and **complexity & order**. Last section of biophilic is **Nature of the Space Patterns** have the last four concepts of biophilic which is **prospect, refuge, mystery, and risk/ peril**. This research will focus on the presence of water concepts.

This study chose presence of water aspects because it plays an important role in biophilic, where it affects physical and psychological health. The Presence of Water concepts 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 [1].

Water is essential to life and its positive experience in the built environment can relieve stress, promote satisfaction, and enhance health and performance. The attraction to water can be especially pronounced when associated with the multiple senses of sight, sound, touch, taste, and movement. Varying design strategies can satisfy the desire for contact with water including views of prominent water bodies, fountains, aquaria, constructed wetlands, and others. Water in the built environment is often most pleasing when perceived as clean, in motion, and experienced through multiple senses (although at muted sound levels) [2]. The existence concept of water increases concentration and memory recovery caused by complex visual stimuli and fluctuating naturally; and increased perception and psychological and physiological responsiveness when many senses are stimulated simultaneously [1].

The presence of water can be felt from seeing, hearing and touching the water. Research has proven that noise greatly impacts stress. Perceptual assessment shows that natural sounds are considered more pleasant than other sounds.

The aim of this study is to identify the dwellers preference on the implementation of presence of water concept in apartments in Jakarta to achieve comfort and health. The data collection was conducted through online questionnaire which was distributed to dwellers in Jakarta. The results of this study can be references for government or private sectors in designing sustainable and healthy residential building especially apartments from the perspective of biophilic design.

2. The methodology

2.1. The method of study

This research is generally a qualitative research which will be discussed descriptively. The diagram below shows the methodology applied in this study (Fig.1). The data collection was conducted through online questionnaire which was distributed to dwellers in Jakarta. The respondents were asked to choose the preferable implementation of presence of water, which was seeing, hearing or touching the water.
After identifying the presence of water implementation, the data then analyzed using distribution analysis to identify the most dominant presence of water implementation. The results then were proposed into design concept application in apartment design.

![Image of methodology diagram]

**Figure 1. The diagram of methodology**

The total respondents were 40 respondents, 27 is women and 13 men. The questionnaire was distributed in campus apartments, namely the University of Indonesia and Bina Nusantara University. The average filling of the questionnaire aged 17-25 years. Most Apartments have less than 10km to their activities, because most apartments are located near where they are operating, and most of the respondents already used public transport.

To identify the dominant implementation of presence of Water, Likert scale was used for each question. The questionnaire used questions that answered by choosing a scale from one to five, one means not comfortable, and five means very comfortable. Respondents will rate their comfort scale for each category of experiencing nature through seeing, hearing or touching water.

3. Result and Discussion

3.1. Identification of Dwellers’ Preferences on the Implementation of Presence of Water in Apartment in Jakarta

From the results of the questionnaire, the average filler of the highest level of comfort questionnaire is seeing the water, and is not too comfortable to touch or be exposed to the water, and is comfortable enough to hear the gurgling sound or the flow of water. But most of the questionnaires chose to be very comfortable and usually comfortable with that situation.
By figure 2, the question about how comfortable people by seeing water, means people will experience water presence by only visuals, they would only see the water. Most are fillers scale from one to five, (one means not comfortable, and five its means very comfortable) they choose 5. Now scientists are quantifying the positive cognitive and physical effects of water. It turns out that living by coasts leads to an improved sense of physical health and well-being. That said, even just looking at images of water makes people feel calmer, scientists find. Michael Depledge of the University of Exeter medical school in the UK and environmental psychologist Mat White conducted a wellbeing study involving photos with greenery and water. They began by showing subjects pictures of green environments slowly adding ponds, lakes, and coasts. Subjects preferred environments with water.

By figure 3, Michael Wenger, dean of Buddhist studies at the San Francisco Zen Center, recommends listening to water to clear the mind. He says that flowing or moving water is ‘white noise.’ Listening to the sound—allowing it to wash over you—is a meditative act that puts you in the moment. The perceptual assessment of the sounds showed that the nature sound was perceived as more pleasant than the noises. This confirms that the selection of sounds was successful, as the goal was to find a nature sound that was more pleasant than any of the noises. The low noise and the ambient noise were similar in perceived pleasantness whereas the high noise sound was rated as the least pleasant sound. The perceptual evaluation also showed that the high noise was perceived as more eventful than the other sounds [1]. People find it comfortable to hear the sounds of water, 28 people responded they are comfortable with hearing the water.
According to figure 4, most of dwellers (28 persons) find it not very comfortable with touching the water. By touching the water, it means people still could see or hear the water, but for touching the water every time or living in a place that always exposed directly with water (physically) people find it not very comfortable, but still touching the water have a good impact for physically and mentally. Near water, but especially in water, our bodily senses—touch, pressure, temperature, motion, position, balance, weight, vibration—are truly alive. Contact with water also helps counter a dulled effect Nichols terms “gray mind.” Spending too much time inside, glued to screens, consuming news and entertainment, can lead to lethargy, lack of motivation, and dissatisfaction. Getting in, on, or near the water improves moods [4]. Only 6 peoples choose being comfortable by touching the water, and 5 peoples that very comfortable.

3.2. Design concept application of presence of water in apartments in Jakarta

Based on the questionnaire distributed, it can be concluded that people are more comfortable with the presence of water to see and hear, but not too comfortable with touching water continuously. Therefore, below are some of the designs applied to the apartment in relation to the results of the questionnaire.

3.2.1 Fitness Center

Fitness center is one of the public facilities in the apartment, this facility is one of the favorite facilities for apartment users, in this facility the presence of water is experience through viewing the water flow, which means that users can only see without hearing or touching the water. The water is designed to flow outside the glass of this facility which is connected to a waterfall in the pool. Users will feel the good effect on the body with the view to the waterfall and swimming pool, people find it very comfortable.
3.2.2 Swimming Pool

The swimming pool is also a public facility in the apartment, is designed to have a waterfall flowing from the 2nd floor so that users get the sensation of hearing the sounds of water flowing and crashing onto each other. The swimming pool is close to the garden at the front of the apartment, with this, garden users can also feel the effects of sound and vision of the water.

![Figure 6. Swimming Pool](image)

3.2.3 Fishpond

This fish pond (figure 8) is at the connection between the two apartment buildings, in this fish pond, dwellers can choose to touch the water or not, because the results of the questionnaire the dwellers are not too comfortable with being exposed (physically) to water constantly, users can play with the water, feeding the fish, and establish direct connections with water without having to swim, this design allows the user to choose whether to do so or not, but this design will still allow the dwellers to have the chance to feel the water directly.

![Figure 7. fishpond](image)
3.2.4 Hydroponic plant in balcony

The hydroponic plant on each balcony so all apartment units can feel the flow of water and green areas, each balcony is designed to have hydroponic plants that are automatically taken care of by the designed system, because not all dwellers can or want to take care of these plants.

Figure 8. Hydroponic pond

There is a pond to drain water throughout the balcony using pipes and pumps on each floor. The pond is located next to the swimming pool of this building and connected to the fishpond; the pond will flow water upwards to each existing balcony. The water will flow from the large pipe tube from the bottom floor to the top floor. On each floor there is a pump that receives and pushes the water back into the pond below, illustrated in figure 9. The next pipe has been perforated and will be filled with hydroponic plants, namely devil's ivy plants that will spread over all parts of the pipe on the balcony railing. The water in the pond is very good for the pond ecosystem, because the flow of plants that give rise to separate oxygen and the flow of water circulation, no water is wasted.

Figure 9. Hydroponic pond system

4. Concluding Remarks

It can be concluded from the results of this study that most existing apartment dwellings do not adequately meet the requirements needed to meet the quality of comfort and in terms of quality of health. With the Biophilic design will help to achieve both of these points, the Biophilic design will get closer to nature, where human natural habitat is natural, the Biophilic design at the point of water presence reduces stress and is good for health, by seeing, hearing or touching water. From the questionnaire survey dwellers more comfortable with water by seeing and hearing, because of that water presence by touching it’s not recommended for most people in their daily life, the presence of water by touching could be implied at more public area than in their private area. The results of this study can be references for government or private sectors in designing sustainable and healthy residential building
especially apartments from the perspective of biophilic design. Keep in mind that this research is initial research, more in-depth research is still needed, about biophilic and about the water itself.

5. References
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