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## Accelerating Healing and Recovery Process of Patients in Healthcare Facilities through Biophilic Design

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### **Abstract:**

*Humanity grows in intimate interaction with nature, and the quality of this relationship is reflected in the emotions, ideas, culture, and health that each individual or community expresses. However, in modern times, the built spaces have been created and designed by assigning nature a function that is minimal and irrelevant to humans' health and pleasure. The era of technology has enabled the belief that humans may neglect their relationship with their environment and that progress can be judged by the ability to modify the natural world. This delusion has aided environmental deterioration and the alienation of humanity from natural systems and processes. Biophilic architecture is a long-term solution to the unfortunate design of urban built environments where the deterioration of natural mechanisms has resulted in growing isolation between humanity and nature. Biophilic design promotes using natural processes and systems as design inspiration in the built environment. The application of biophilic concepts in healthcare facilities is one of the pillars of healthcare humanization. Healthcare facilities can create immense stress, anxiety, and fatigue depending on how they are designed. Hospital design tends to make the experience as pleasant as possible, and one approach to doing so is through Biophilic design. This study aims to examine the impact of Biophilic design on patients' recovery in healthcare facilities with a view to proposing a paediatric hospital that infuses natural elements in design in Ota, Ogun state, Nigeria.*

**Keywords:** Biophilic design, nature, built environment, environmental deterioration, healthcare facilities

### **1. Introduction**

The architecture of the hospital must be an agent and instrument of cure and healing (Foucault, 2020). Healthcare facilities are meant to provide a healing atmosphere that reduces stress on patients, their families, and caregivers while improving the patient's capacity to cope and maximising the efficacy of medical therapy on the patient's health (Ulrich, 2003).

The main objective is to influence patients' and staff's psychological and physiological reactions toward their environment, producing a more beneficial healing environment and shortening patients' stay.

However, due to their industrial and sterile designs, most healthcare facilities are often seen as negative spaces. They do not create a healthy and healing environment for patients and often evoke feelings of unease, anxiety, and fatigue, promoting a stress response in the body. The power of architecture to impact patients' recovery time and the overall effectiveness of these facilities tend to be overlooked (Podbelski, 2017).

The global health challenges of the 21st century require a new way of thinking and a change in the organisation of healthcare services through an approach that considers human needs in their entirety with respect to the treatment of diseases and not in a strictly therapeutic sense (Totaforti, 2018). According to several studies, the humanisation of healthcare spaces and contact with nature can empower the patient and have a positive impact by reducing stress and pain and improving emotional well-being. Indeed, a growing body of research confirms the benefits of interacting with nature in healthcare settings. The results of such studies have helped to better-define a new design approach that benefits individuals' psychophysical well-being and improves their health.

Biophilic design has received increasing attention as a design philosophy in recent years. It is a design philosophy that encourages the use of natural systems and processes in the design of the built environment (Kelley, S. R. 2000).

Biophilic design is based on the Biophilic hypotheses, which propose that humans have an innate connection with

the natural world (Wilson, E. O. 1984) and that exposure to the natural world is, therefore, important for human well-being.

## 2. Research Method

The mixed approach, which combines the quantitative and qualitative research methodology, was used for data collection, measurement, and analysis in the study. The study looked at how patients' recovery in particular hospitals was affected by biophilic architecture. Exposing patients to natural elements such as plants, natural light, natural landscapes and ecosystems, natural ventilation, images of nature, natural materials, etc., within the hospital's internal space could speed up the healing process and reduce fatigue and psychological stress, thereby reducing the dependence on drugs and lengthy hospital stays.

The research design used is to first identify the characteristics and attributes of biophilic design through existing literature. The identified attributes and characteristics were then evaluated in selected hospitals in the study area by carrying out case studies. A questionnaire was administered to investigate respondents' impressions of the impact of biophilic design on patients' recovery. The respondents include professionals in the healthcare sector, such as paediatricians, nurses, caregivers, psychologists, social health workers, patients (children aged 5-18), their parents, and other family members.

## 3. Results

The study aims to design a pediatrics hospital for Ota Township in Ogun State, Nigeria, with a research interest hinged on the impact of biophilic design on patients' recovery. A data response survey was carried out to infer relevant information that is precipitated by the set aim and objectives of the study. Towards this end, a set of questionnaires was proposed and served on respondents with regard to salient issues within the study focus. Forty-one responses were gotten and analyzed succinctly. The result is discussed below as follows in the form of charts.

### 3.1. Age

Respondents with the age range 36-45 (45%) form the majority of respondents. This is followed by respondents aged between 46-55 (25%). This shows that most of the respondents are fully matured minds who have either been a patient or visited a paediatric hospital.

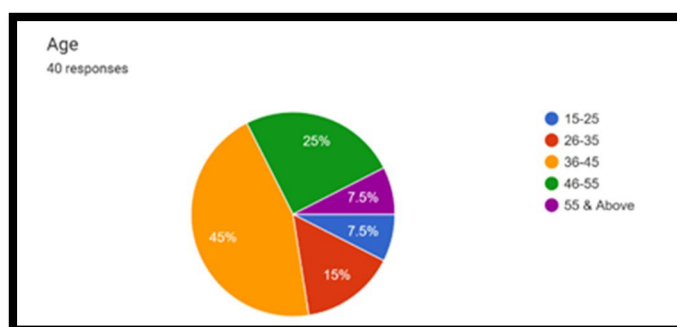


Figure 1: Age of Respondents  
Researchers Field Survey, 2022

### 3.2. Gender

The majority of the respondents are males. While this is not intentional, they are deemed valid respondents because their opinions were considered objective enough to the study focus.

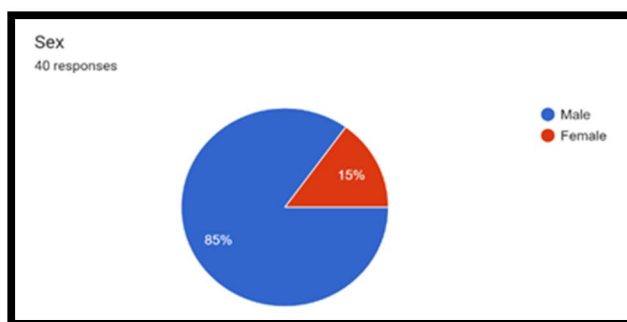
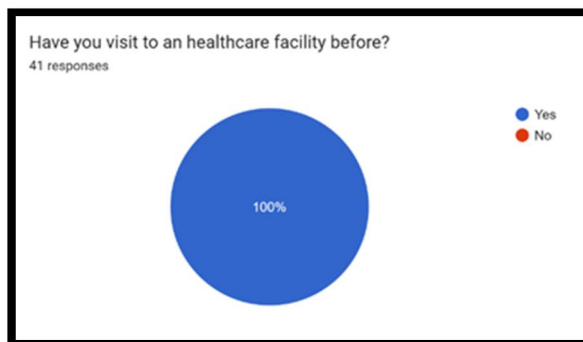


Figure 2: Gender of Respondents  
Researchers Field Survey, 2022

### 3.3. Visit to Healthcare Facility

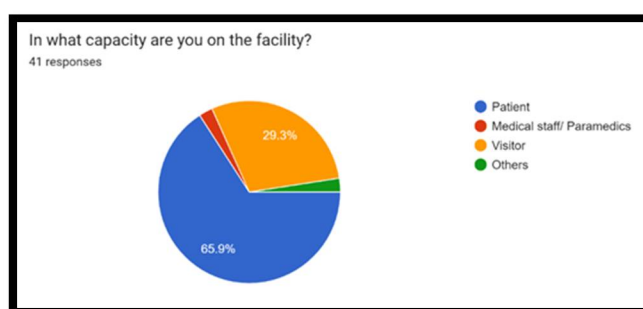
All respondents agreed that to be valid to answer further on the questionnaire, they must have been to a health care facility before either on a visit, at work, or as a patient.



*Figure 3: Visit to Healthcare Facility  
Researchers Field Survey, 2022*

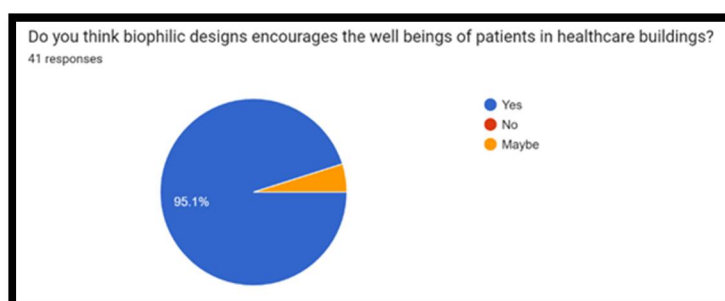
### 3.4. Capacity of Visit

As seen from the figure below, the majority of the respondents are either former patients or recent visitors. Thus, they represent a valid data source for the study.



*Figure 4: Capacity of Visit  
Researchers Field Survey, 2022*

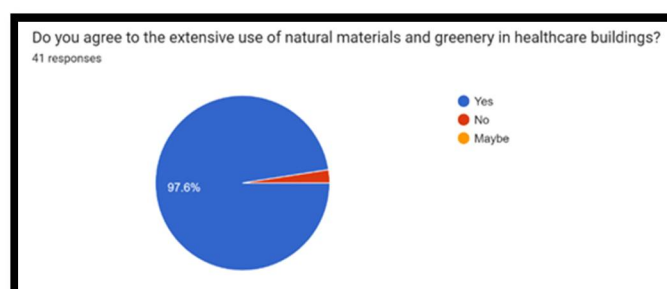
### 3.5. Biophilic Design and Well-being of Patients in Healthcare Buildings



*Figure 5: Biophilic Design and Well-being of  
Patients in Healthcare Buildings  
Researcher's Field Survey, 2022*

### 3.6. Extensive Use of Natural Materials and Greenery in Healthcare Building

About 97% of the respondents agree that the extensive use of natural materials and greenery is highly desirable.



*Figure 6: Extensive Use of Natural Materials  
Researcher's Field Survey, 2022*

### 3.7. Presence of Waterbody

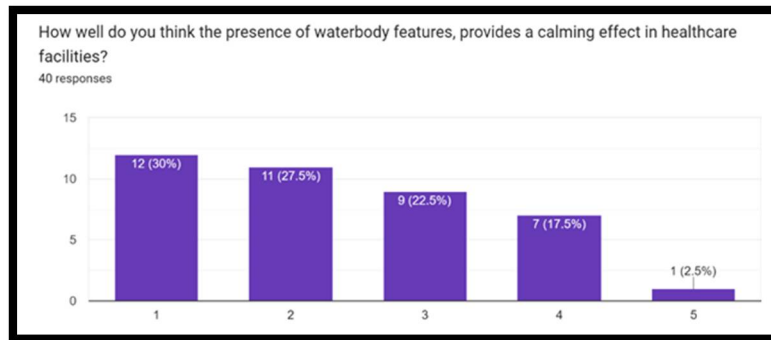


Figure 7: Presence of Waterbody  
Researcher's Field Survey, 2022

### 3.8. Views through Extensive Glazing and the Recovery Process of Patients

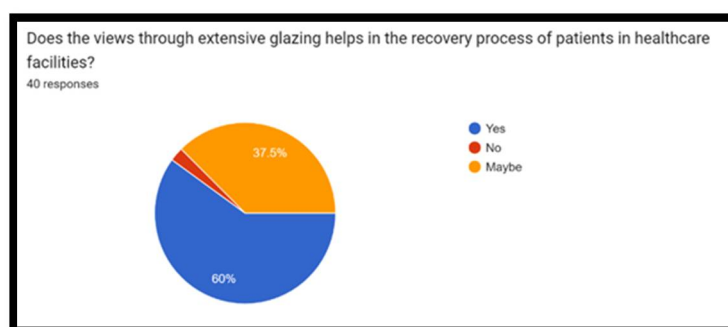


Figure 8: Views through Extensive Glazing  
Researcher's Field Survey, 2022

### 3.9. Wider Window Panes in Healthcare Facilities and Recovery of Patients

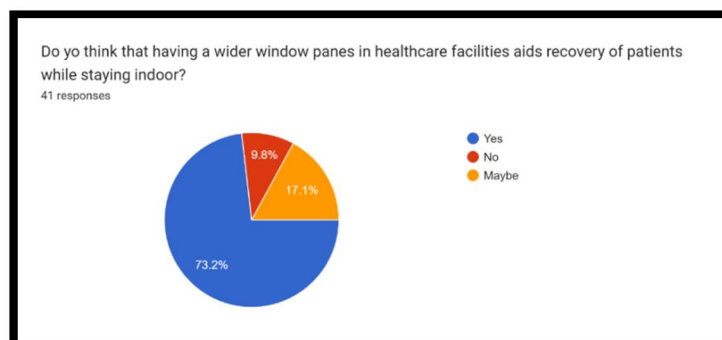


Figure 9: Wider Window Panes in Healthcare Facilities and Recovery of Patients  
Researcher's Field Survey, 2022

### 3.10. Biophilic Designs and Positive Recovery Response of Patients

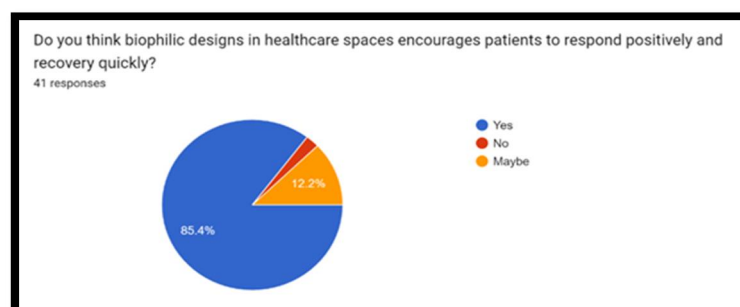


Figure 10: Biophilic Design and Positive Response of Patients  
Researcher's field survey, 2022

### 3.11. Biophilic Design Propositions and Therapeutic Benefits

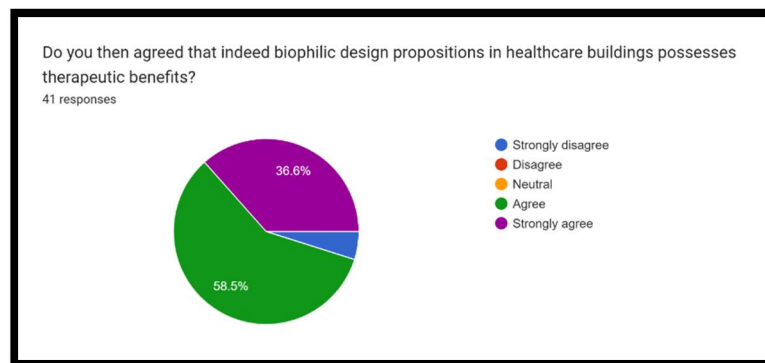


Figure 11: Therapeutic Benefits of Biophilic Design  
Researcher's Field Survey, 2022

### 3.12. Influences of Landscaping Elements in Biophilic Designs

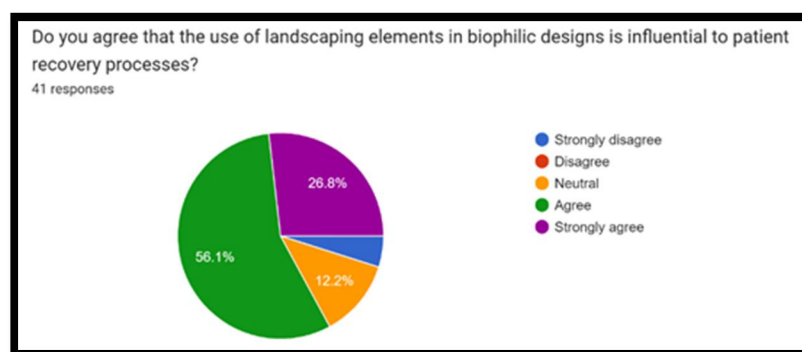


Figure 12: Influences of Landscaping Elements in Biophilic Designs  
Researcher's Field Survey, 2022

### 3.13. Air Quality Influence and Biophilic Design Proposition

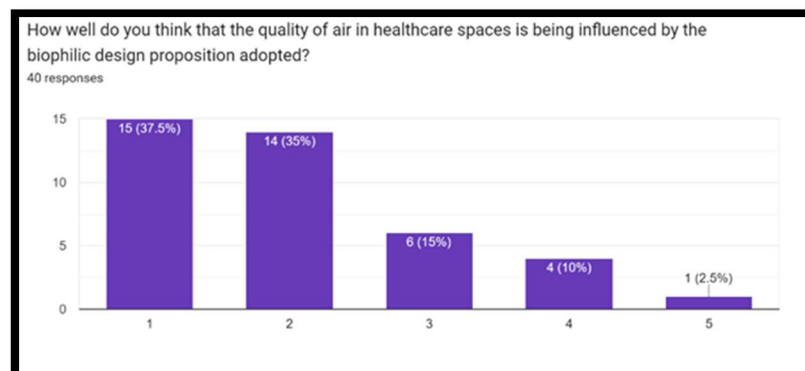


Figure 13: Air Quality  
Researcher's Field Survey, 2022

## 4. Discussion

After careful analyses of the responses, the followings were the findings adjudged to be critical to the study focus.

- The extensive use of natural materials and green landscaping can aid biophilic design propositions in a healthcare facility.
- Glassed windows aid patients' view of the outside spaces and, as such, help to aid in the recovery processes.
- The result has associated Biophilic elements as primary influences for faster recovery rates for patients, decreased dependency on medication, reduced staff and family stress, and improved emotional wellness as a result of natural daylighting and views of nature.
- The application of Biophilic design in the interior spaces of healthcare facilities has great implications for users, such as decreasing anxiety and stress levels, decreasing hospital stay, and increasing recovery rates and satisfaction from the patient itself.
- Finally, that biophilic designs in healthcare facilities do possess therapeutic benefits.

## 5. Conclusion

Without considering their physiological needs, humans have used technological advancements to improve their health and welfare in their homes and workplaces. As a result, the natural habitat has been replaced by the built environment, where people spend about 90% of their time. As a result, most modern buildings are no longer connected to nature, if not completely alienated from it, and they also cause significant environmental harm.

Although recent advancements in sustainable design have discovered a solution for this issue, they did not consider re-connecting humans with nature in contemporary built environments; this re-connection has been dubbed 'Biophilic design.'

By creating a fresh framework for the fulfilling experience of nature in the built world, the biophilic design seeks to remedy the shortcomings of modern architecture and landscape practice. In an organic, modern, and constructed environment that prioritizes people's health, fitness, and welfare, the biophilic design aims to create an appropriate habitat for humans (Kellert, 2017).

Since nature impacts people's physical, psychological, and social wellness, the study concluded that people are inherently drawn to it. Therefore, healthcare institutions need to include natural features and elements in their interiors to create a space that is friendly, stress-free and welcoming for patients, the general public, as well as the medical personnel.

Patients' stress and fatigue can be relieved, and the healing process speeds up by incorporating natural lighting, ventilation, views of the outdoors, plants, and other greenery into healthcare facilities' interior design. It could also be said that adding natural imagery or organic-design furniture hastens the healing process.

## 6. Recommendations

- By incorporating the biophilia idea into healthcare designs, it will be possible to improve both the sustainability and performance of the buildings while also boosting the users' quality of life, wellness, and health.
- In order to guarantee that patients receive ample natural light through skylights and windows and provide more views of the outside world, healthcare facilities must be equipped with indoor gardens, fountains, and ponds. Additionally, healthcare buildings should be orientated to get the most sun.
- In addition to a children's play area, healthcare facilities ought to have gardens with natural elements, adaptable seating areas for socializing and relaxing, private spaces, clear signage, and opportunities for physical activity.
- The incorporation of biophilic design into healthcare facilities should go beyond simply incorporating natural elements into the built environment. It should also include the introduction of visual arts and technology through the use of nature representations in paintings, photographs, prints, television screens, eyeglass displays, and other media. This could be done in settings where it may be challenging to have outdoor views or gardens.

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