

Perception of Open Spaces Integration in Maternity Hospital Designs in Kaduna, Kaduna State, Nigeria

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Abstract

The awareness of the positive effects of open spaces whether indoor or outdoor on patients' healing process has long been identified in hospital architecture and the integration of open spaces for the purpose of therapy has begun to be applied. This research aims to provide a new holistic approach to maternity hospital design that involves relieving the fears and disorientation of patients (through the integration of open spaces in maternity hospitals for such therapeutic functions) that may hinder medical treatment. Qualitative research method was applied for this research, making use of case study approach and application of observation schedule. Results of this research show that there is total disregard of the use of open spaces in hospital design. The research recommended that there should be consideration towards the integration of open spaces into future maternity hospital design.

Keywords: Maternity; Hospital; Courtyards; Open spaces; Therapeutic

Introduction

The cognizance of the positive effects of open spaces whether indoor or outdoor on patients' healing process has long been identified in hospital architecture [1]. It has become very vital to not only provide open spaces that have therapeutic functions for patients, but also to create a connection between the interior of health care centres and exterior landscaping features [2]. As a structure that is committed to the wellbeing of man, a health facility should have a serene environment for healing, which helps patients and their relatives to be restored to perfect state of health. There is a growing interest in the architecture of hospitals for a 'patient-centred' design of hospitals by the integration of physical environment (open spaces) in form of courtyards, front porches, and vegetative land cover to improve patient perception and health expectations within this environment [3]. Therapeutic open spaces function to provide physical settings and organizational culture that support patients and families through the stresses imposed by illness, hospitalization, medical visits, the process of healing sometimes, bereavement and in this case health complications associated with maternity. Hospitals have been criticized for their poor spatial qualities and disregard towards the patient, who is supposed to be in the genesis of its core [4]. According to Dejana Neducin et al. as patient's perception while staying in a hospital is frequently distorted, limited and influenced by various external factors, the patient is in constant need of a greater support than in everyday circumstances, through the provision of open spaces for therapeutic reasons [5].

Literature Review

Maternity hospitals

Maternity hospitals, also called lying-in-hospitals are hospitals dedicated to women during their time of pregnancy, during and after child-birth. Maternity hospitals provide care to women and their new born infants either in a maternity department located within a general hospital or existing as a stand-alone hospital (Health Information and Quality Authority 2016). Clinical training in midwifery and obstetrics also take place in maternity hospitals. Maternity hospitals were founded in the nineteenth century as urban-based charity shelters to serve the unfortunate, homeless, and working class poor population that had a high infant mortality rate. A tactic to solve this problem was to improve maternity care for this group [6]. The maternity hospitals

in our day have been regarded as vital part of the urban fabric that is open to the community; this is the same as other public buildings. This new approach in planning and designing of both indoors and outdoor spaces has achieved a shift in hospital's public image; where patients no longer feel isolated or secluded from rest of society.

Open spaces

The term 'open space' refers to green space consisting of any vegetated land, structure, water, path or geological feature within buildings and on the edges of settlements, in civic space consisting of squares, market places and other paved or hard landscaped areas with a civic function [7]. Open spaces can also be defined as land which are openly accessible and have been designated for leisure, play, recreation or sport. The uses of open spaces can either be for passive or active reasons. Active open spaces are usually for sport, exercise or active play; while passive open spaces are used for seating and relaxing. The application of passive spaces is more effective in this instance. Open spaces found within buildings and structures have significant impact on the occupants and the state of the structure as well. The presence of natural spaces nearby improves well-being and access to or views of the natural environment to improve mental functioning and help in recovery from surgery and sickness [8]. According to Peter and Daniel, these open spaces which are often characterized by the presence of high green coverage in forms of grass, shrubs and trees have therapeutic, ecological and environmental importance [9]. Through their importance, open spaces can help people find within areas they are located in adjusting to healthy lifestyles, hence the encouragement to integrate this building features into healthcare facilities. In recent times, there has been an increase in attention directed towards research

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concerning the evaluation of open spaces (including green areas and green spaces) and their components as well as their effect on the environment. According to Ulrich et al. open spaces are necessary components of structures, but poor design of an open space can lead to misuse and unused areas, undesirable behavior, strain on management, and other difficulties [10]. The presence of open spaces in structures should be;

1. Reasonable to manage,
2. Flexible in use and therefore adaptable,
3. Able to foster a sense of ownership so that residents become involved in maintaining the space and
4. A positive impact on the surrounding natural resources.

Open spaces in hospitals

Dejana Nedučin et al. observed that during the review of the development of hospitals through history, the acknowledgement of the positive effect of open spaces, natural environment on patients' restorative process has been present in hospital architecture [5]. Proof of strategic therapeutic/healing gardens can be traced to the European primitive monastic hospitals, where patients' cells enclosed around and had an uninterrupted access to colonnaded courtyards.

Criteria for the integration of open spaces within hospital areas

Accessibility: It is essential because people, patients, staff and users of hospital space need to be aware that the open spaces actually exist, and that they are easily accessible through entrances and paths and useable.

Visibility: The more open spaces are visible and people are aware of it, the more the activity areas and paths around and within it will be preferred. Patients' rooms should have views of the open spaces so that they can enjoy it even if they are unable to visit it.

Physiological comfort: As hospital patients are often sensitive to temperature, options such as sunny and shady areas should be provided, as well as seating that are shielded from breeze by plants or structures.

Quietness: Open spaces designed for therapeutic purposes should be quiet and removed from sources of noise or sounds inside the hospital.

Hospitals today have come to be regarded as vital parts of the urban context that are accessible to the community; this is similar to other public buildings. This fresh method in the planning and design of both interior and exterior spaces brought about a change in hospital's public image [5]. The open spaces to be integrated into the hospital environment should be perceptible from the wards of patients, interior interactive spaces and passageways, for both safety and medical purposes. Visibility out and through also provide ease as it is psychologically therapeutic, because it lessens the sense of seclusion and claustrophobia by providing an unbroken interaction with the outside world. It might also pique patient's interest to the surrounding environment, which would ultimately lead to either instantaneous use or a resolution to visit it later [11].

Benefits of presence of open spaces

Kant and Kumar [11] observed two benefits of presence of open spaces in the hospital to include:

- **Ecological Benefits:** Due to solar radiation, air temperature, wind speed and relative humidity varying considerably, as a result of built environment in cities, the urban heat island effect is caused by the large areas of heat absorbing surfaces; this can increase developed area temperatures of 5 degree centigrade. Therefore, a provision of open spaces consisting of vegetation and green cover within built environments can help to alleviate the situation. Climate and temperature regulation can be introduced within presence of natural environment infused in built up areas.
- **Energy Saving:** The introduction of natural environment into structures to reduce the energy costs of cooling buildings has been progressively recognized as a cost effective reasons for increasing green space and tree planting in built-up environments. Plants improve air circulation, provide shade and they evaporate-transpire.

Research Methodology

Observation method of research was employed. Observation method of research involves directly observing and studying a sample of a population. The assessment was conducted in Kaduna, Kaduna state, Nigeria. Ten hospitals six of which are private, two governments and other two of Catholic administration were selected deliberately by purposive sampling of non-probability sampling method. The selection of these hospitals was based on the existence of maternity departments in their structure amongst other hospitals lacking such. The population was divided into three local government areas which comprise of Kaduna North, Kaduna South and Chikun. Maternity hospitals were selected based on the geographical areas which make up Kaduna city using area random technique as indicated in Table 1. Data analysis took the form of simple descriptive statistics and content analysis represented in the form of percentages. Data collated was computed manually and tabulated in Microsoft Excel Spread Sheet Programme.

Findings and Discussion of Results

The results in Table 2 show that to a fair extent there is no total disregard of the provision of open spaces within hospital environments as event in plates I-V (Figure 1-5). It however shows that 30% of the hospitals analysed had no integration of open spaces within or around their structure. While, 70% of the health facilities observed as cases studies made provision for open spaces within their environment.

Table 3 shows that 80% and 50% of the hospitals studied interpret open spaces as being in the forms of front porches and courtyards. These are the most common forms of open spaces seen during the course of this research. While 60% had these open spaces in form of vegetative land cover and 30% as entry gardens and 10% as roof gardens. Walk-in gardens were however 20%.

S/No.	Name of hospital	Local Government Area
1	St. Gerard's Catholic Hospital, Kaduna	Kaduna South
2	Jowako Specialist Hospital, Kaduna	Kaduna North
3	Gwamna Awon General Hospital, Kaduna	Kaduna South
4	Harmony Hospital, Kaduna	Kaduna South
5	Sabo General Hospital, Kaduna	Chikun
6	Bethesda Clinic and Medical Centre, Kaduna	Kaduna South
7	Barau Diko Hospital, Kaduna	Kaduna North
8	Giltooe Aris Specialist Hospital, Kaduna	Kaduna South
9	Nasara Specialist Hospital, Kaduna	Kaduna North
10	Chasel Hospital, Kaduna	Kaduna North

Table 1: Name of hospitals sampled.

S/No.	Name of Event centre	Available	Unavailable
1	St. Gerard's Catholic Hospital	✓	
2	Jowako Specialist Hospital		✓
3	Gwamna Awon General Hospital	✓	
4	Harmony Hospital		✓
5	Sabo General Hospital	✓	
6	Bethesda Clinic and Medical Centre		✓
7	Barau Diko Hospital	✓	
8	Giltooe Aris Specialist Hospital	✓	
9	Nasara Specialist Hospital	✓	
10	Chasel Hospital	✓	
	Total	70%	30%
	Percentage		

Table 2: Assessment of the provision of open spaces in the hospital environment.



Figure 1: Plate I-Courtyard in maternity unit in St. Gerard's Catholic Hospital.



Figure 2: Plate II-Open courtyard in St. Gerard's Catholic Hospital.



Figure 3: Plate III-Gwamna Awon general hospital Nasarawa road, Kaduna administrative block.



Figure 4: Plate IV-Gwamna Awon General Hospital Nasarawa road, Kaduna: Open space plaza within built-up environment.



Figure 5: Plate V-Walkway encircled around an open courtyard in Sabo General Hospital, Kaduna.

Table 4 shows that 80% of the hospitals have their open spaces at the entrance of their buildings and 50% are centrally located in forms of courtyards, while 50% provided open spaces in between built-up areas in their environments, 10% on the roofs and 40% around the structure.

Table 5 shows that 60% of the hospitals studied have a visual connection between the indoor hospital rooms or wards and the open spaces within the hospital environment. While 40% do not have any visual connection between the indoor hospital rooms or wards and the open spaces.

After studying open spaces in maternity hospitals in the study area, figure 6 showcases a design that has fully incorporated the importance

S/n	Name of Hospital	Vegetative land cover	Land	Front porches	Entry gardens	Courtyards	Plazas	Roof gardens	Healing gardens	Walk-in gardens
			scaped setbacks							
1	St. Gerard's Catholic Hospital	✓		✓		✓				
2	Jowako Specialist Hospital					✓				
3	Gwamna Awon General Hospital	✓		✓	✓	✓		✓		
4	Harmony Hospital			✓						
5	Sabo General Hospital	✓	✓	✓		✓				
6	Bethesda Clinic and Medical Centre									
7	Barau Diko Hospital	✓	✓	✓	✓	✓				✓
8	Giltooe Aris Specialist Hospital	✓	✓	✓	✓					✓
9	Nasara Specialist Hospital			✓						
10	Chasel Hospital	✓	✓	✓			✓			
	TOTAL	6	4	8	3	5	1	1	0	2
	Percentage	60%	40%	80%	30%	50%	10%	10%	0%	20%

Table 3: Showing the types of open spaces available within or around the hospital.

S/N	Hospitals	At The Entrance	Centrally Located	In Between Structures	Outdoor And Around The Structure	On The Roof
1	St. Gerard's Catholic Hospital	✓	✓		✓	
2	Jowako Specialist Hospital		✓			
3	Gwamna Awon General Hospital	✓	✓	✓	✓	✓
4	Harmony Hospital	✓				
5	Sabo General Hospital	✓	✓	✓		
6	Bethesda Clinic and Medical Centre					
7	Barau Diko Hospital	✓	✓	✓	✓	
8	Giltooe Aris Specialist Hospital	✓	✓	✓	✓	
9	Nasara Specialist Hospital	✓				
10	Chasel Hospital	✓		✓	✓	
	Total	8	5	5	4	1
	Percentage	80%	50%	50%	40%	10%

Table 4: Location of open spaces in the hospital environment.

S/N	Hospitals	YES	NO
1	St. Gerard's Catholic Hospital	✓	
2	Jowako Specialist Hospital	✓	
3	Gwamna Awon General Hospital		✓
4	Harmony Hospital		✓
5	Sabo General Hospital	✓	
6	Bethesda Clinic and Medical Centre		✓
7	Barau Diko Hospital	✓	
8	Giltooe Aris Specialist Hospital	✓	
9	Nasara Specialist Hospital		✓
10	Chasel Hospital	✓	
	Total	6	4
	Percentage	60%	40%

Table 5: Assessment of visual connection between indoor hospital rooms and the open spaces as natural environment.

of open spaces for therapeutic function into the hospital design.

Conclusion

The study has revealed that the integration of open spaces into maternity hospital design has been neglected and considered irrelevant and unconnected to the psychology of the users of hospital space. It was observed that only 70% of maternity hospitals have no open spaces



Figure 6: Integration of open spaces within the maternity hospital design as conceived by authors.

within their hospital environment. From oral interviews conducted with hospital staff and patients, it is alarming that users of hospital spaces see no need of open spaces within the hospital environment. The survey conducted however, shows optimism towards the vitality of the integration of open spaces into the hospital environment. The design of healthcare facilities is incomplete without the integration or application of open spaces for therapeutic function and psychological

balance of the patients, staff and visitors. The lack of open spaces has an effect on the patients' journey to wholeness.

Recommendation

Future designs of hospital should be encouraged to make provision of open spaces within and around the hospital environment. Consideration as regards to the integration of open spaces within maternity hospital design should be learnt thereby creating suitable hospital environments where patients can be nursed back to wholeness both physically and psychologically.

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