Afropolitan Journals

ISSN: 3027-2114 www.afropolitanjournals.com

A Review of Evidence-Based Design Principles on the Design of Maternity Healthcare Facility in Gombe State

Bakoji Isa[1]; Bashir Usman Mohammed, PhD[2]; Bukar Usman Wakawa, PhD[3]; Isa Bakoji, PhD[4]; and Ogwuche Henry Audu[5]

[1,2,3]Department of Architecture, Abubakar Tafawa Balewa University, Bauchi. [4]Nigerian Correctional Service. [5]Department of Architectural Technology, Federal Polytechnic, Bauchi.

DOI: *https://doi.org/10.62154/ajesre.2024.017.010487*

Abstract

Evidence-based design (EBD) in healthcare facilities has gained prominence globally, focusing on improving patient outcomes and staff satisfaction through innovative design approaches. While EBD is widely adopted in the United States and Europe, its application in Nigerian healthcare facilities remains limited Studies have highlighted the need for humanistic design in Nigerian healthcare environments, emphasizing the importance of cultural context in defining humanization Although Nigerian nurses recognize the value of evidence-based practice, barriers such as difficulty understanding statistical terms hinder its implementation. EBD methodology involves formulating hypotheses, testing, and analyzing outcomes to inform hospital design decisions. Incorporating EBD elements in Nigerian healthcare facilities could significantly reduce stress, increase job satisfaction, and improve overall health outcomes. Further research is needed to assess EBD practices in Nigerian healthcare settings and develop culturally appropriate solutions. It was recommended that by adhering to these evidence-based principles, the maternity healthcare facility in Gombe state can become a model of excellence in maternal and child health care.

Keywords: Healthcare Facilities, Cultural Content, Innovative Design, Maternity Healthcare, Health Outcomes.

Introduction

Maternal and perinatal mortality in Gombe State, Nigeria, is increasingly alarming with the need to improve emergency obstetric healthcare services (Selçuk, 2022). In recent years, healthcare system architecture has been experiencing challenges due to increasing diversities in societal norms and demographics, population explosion among others. According to Zeng (2016) healthcare building design presents a complex architectural challenge that requires a complete state of physical, mental and social wellbeing as it is also influenced by cultural values (Maojorce, 2011). Culture has a pattern of ideas, custom and behavior shared by a particular people or society influences healthcare system as well as its architecture (Turknitonga, 2018).

Based on the available theories in hospital design and management, Restoration theory (Von-Lindern, Lymeus& Hartig, 2017) and Evidence-based design theory (Dinners *et al.*, 2018), academic knowledge and Practice play a significant role. Thus, define and describe

environment as an environment that renews This provides some explanation for why health practice alone cannot be expected to lead healing but the introduction of design qualities (Interaction between humans, building and the environment) for which found evidence of improved patients outcome from long applied Evidence-Based Design (EBD) experience architects in hospital design. According to Jaja and Imaah (2021) healing environment historically have often been places where nature was deemed to have a great impact on healing and recovery. The idea was expressed in a variety of ways. For example, Buildings and rehabilitation have often been located in a peaceful and serene environment with dramatic views of landscapes. Nurturing the land and working in fresh air has been a model for many hospitals especially mental and child maternal health.

Therefore, EBD is the future of the new super hospital design (Hyttel, 2010). Research has proven that enhancing design to fit functions that reflect everyday life improves and promote fast recovery process of patient and better work performance of hospital staffers. EBD uses the best available research on the safety and effectiveness of specific practices to help guide maternity care decisions and to facilitate optimal outcomes in mothers and newborns. In the same vain, it is required of hospital designers, managers and policy makers to know the influence of the hospital design characteristics on the cognitive and physical health of the patient (Jaja and Imaah, 2021).

Statement of the Problem

In Gombe State, high maternal and perinatal mortality rates persist, highlighting the need for improved emergency obstetric care and revitalized Maternal and Perinatal Deaths Surveillance and Response activities (Mohammed *et al.*, 2022). Healthcare centers particularly maternity healthcare facilities need to be reminded to direct their efforts on the patients. However, the system has grown more complex and fragmented and providers feel more pressure to more patient attention in less time; it becomes evidently clear that health care centers should become more centered on the need of the patients and around the needs of the system itself.

Literature Review

As a result of Evidence-Based Design (EBD), innovative design technological approaches and practices, healthcare design has dramatically improved over the years. This has resulted in the emergence of new domains in the design of healthcare facilities. One facet of these domains is "evidence-based design" (EBD) practices, which have left indelible imprints on healthcare design and the built environment by focusing on end-users. EBD has become a beneficial trend in healthcare design and is predominantly applied in the United States and Europe. However, this design practice has not been significantly utilized in the design of Nigerian healthcare facilities in Nigeria (Timothy, Uwajeh & Bamisaye, 2022).

The use of knowledge on psychologically supportive environments is defined as evidence-based design (Jaja and Imaah 2021). However, studies in northeast Nigeria, especially in Gona, Gombestate reveal gaps in the provision of essential evidence-based interventions during childbirth, with many basic risk assessments often overlooked (Exley *et. al.,* 2020). Evidence based design/design is receiving considerable attention within the general field of human services and within the disciplinary literatures of specific professions, such as medicine, psychiatry, psychology and social work, marital and social therapy (Bruce, 2020). According to Akonbeng (2005) evidence-based medicine refers to guiding design decisions by scientific evidence in order to promote health and well-being, For example, use of the evidence-based design on healthcare environments might impact health related outcomes such as length of stay, pain, medication intake, stress, arousal, mood, or environmental assessments. However, according to (NOUN, 2020) there are many medical centres in Nigeria. The medical centres are classified based on the management or the services they rendered. Medical centres can be classified based as private hospitals or government hospitals. On the other hand, health care facilities can be classified in to two: Acute care facilities and chronic care facilities.

A. Acute Care Health Facilities

Acute health is a secondary health care where a patient receives active but short-term treatment for a severe injury or episode of illness, an urgent medical condition, or during recovery from surgery (Drugxpert, 2017, NOUN, 2020). The various types of acute care facilities are: Primary health centres, Unit hospitals (clinics), General hospitals, Central hospitals, Teaching hospital and Federal Medical Centre (FMC).

- Primary Health Centres (PHC): According to (NOUN, 2020) they are the most common health care facilities in Nigeria. They are found in villages, communities and cities. However, their services are gradually declining in the cities as more and bigger hospitals are springing up in these locations every now and then. They are still very popular in the villages as their services are really helps the villagers a lot, especially those that do not have access to big hospitals in the cities. They are usually small in terms of structure. It may be a single flat with some few rooms as offices and diagnosis room. Medical equipment at PHCs are usually those for diagnosing minor ailment such as a sphygmomanometer, stethoscope, thermometer, etc. Their major service is immunization (vaccination). However, due to the distance from most hospitals to bigger hospitals in the cities, these health centres now carried out antenatal care with baby delivery. Staffs in these facilities are made of nurses, midwives, community health extension workers (C.H.E.W), health care assistance.
- Unit hospital (clinics): According to (NOUN, 2020) Unit hospitals are common in some selected villages that their population is putting a challenge on the services rendered by primary health care centres. Other places where they can be found include the tertiary

institutions of learning. Sometimes, they are bigger than health care centres based on structure. It may occupy a whole compound. Unit hospitals have more equipment, which makes them more advanced than health care centres. They can treat minor ailments including simple burns, wounds etc. They may have a room or two with a bed to admit and treat a patient for some days. However, the majority of their cases are outpatient. Staff are made up of a doctor (who likely is not a specialist), a couple of nurses, midwives, and health care assistance. However, the doctors can be up to two in some locations. A good example of a clinic is Medical Reception Centre (M.R.S) in army barracks. They offer medicals services to the Nigeria army as they are scattered throughout army barracks.

- General and Central hospitals: According to (NOUN, 2020) General hospitals are very common in towns and cities. They are big establishments in terms of structure. It can occupy a single building or a couple of blocks. They can treat any kind of illness or injury. For medical conditions that are more than what they can handle, they refer them to teaching hospitals or federal medical centers. They have more equipment for carrying out operations, emergency conditions, with ward for inpatient and outpatient care. They have many units such as pharmacy unit, laboratory etc. Most general hospitals have between 50-100 beds for in-patients. They may have ambulance for rescue operation. Staff includes physicians, nurses, pharmacists, physiotherapists, medical laboratory scientist etc.
- Federal Medical Centres (FMC): They are federal owned hospitals that are scattered across the country. They operate services similar to what central hospital do. Many of them are located in state capitals.
- Teaching Hospitals: These are primary training centres for physicians, pharmacists, physiotherapists, medical laboratory scientists are train. The interns and residents who work under the supervision of experienced physicians or pharmacists are also train in teaching hospitals. They run services like that of a central hospital but with higher care given. Staffs are specialist in every field with bunch of experiences. They have advanced and complicated equipment used in diagnosis and treatment including many hospital beds as they render some advanced foam of care. Some teaching hospitals in Nigeria have a landing spot for airplane ambulance including their normal car ambulance. Many of the physicians working there hold a teaching position at the university affiliated with the hospital.

B. Chronic Care Health Facilities

According to (NOUN, 2020) these are hospitals that provide advanced and sometimes long term services to patients. Examples includes: Specialist centre, Maternity/Pediatrics hospitals, Psychiatric hospitals, orthopedic hospitals etc.

1. Specialist Centre: According to Drugxpert, (2017) these set of hospitals are managed by either privates or government. Majority of the hospitals in Nigeria are owned and managed by the government. Specialist centres are hospitals that can treat just one medical condition. They are referred to as specialist hospital because they know about such conditions very well as many specialists in that field work there. For example, hospital for the eye may have a specialist in different conditions that affect the eye. There will be some specialist that know how to treat glaucoma, others cataract, and still others myopia and other conditions.
2. Maternity/Paediatric Hospitals: These are hospitals just for women, pregnant women, and nursing mothers. Some have added family planning to the list of their services. 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 cited in Ayuba *et al.,* 2019). Additional, 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.

Methodology

Basically, upon thorough review of existing materials, the research questionnaire was designed and aimed at gathering information from the study respondents in order to answer the study questions and other questions relevant to the general objectives.

Analysis, Results and Discussions

The analysis has been conducted with the aid of statistical package for Services and Solutions (SPSS). SPSS Software could be used to carry out descriptive and inferential analysis in the form of frequencies, percentages, mean scores, standard deviation, regression and one sample T-test for the research questions and hypotheses (Shehu *et. al.,* 2020; Shehu & Shehu, 2022).

Table 1: Presentation of questionnaires distribution in the hospital

Particulars of questionnaires	*Frequency*	*Percentage*
Number of questionnaires administered.	210	100
Number of questionnaires retrieved	197	93.8
Number of questionnaires not returned	13	6.20
Number of questionnaires wrongly filled	18	9.14
Number of usable questionnaires	179	90.86

Source: *Field Survey, 2024*

From table 1, it is observed that 210 questionnaires were administered to respondents. 197 questionnaires representing 93.8% were returned and 13 questionnaires representing

6.20% were not returned. 18 questionnaires representing 9.14 % were not properly filled while 179 questionnaires representing 90.86% were correctly filled and thus suitable for data analysis.

Table 2: Response Rates on the evidence based design strategies and innovative health and well-being approaches

VARIABLES	QUESTIONS	SD	D	U	A	SA
Building Orientation and wayfinding	The hospital are positioned to minimize sun exposure on walls during peak heat hours. (East-west facing walls are minimized) with good wayfinding	23	35	26	51	44
	The hospitals allows for natural cross-ventilation through strategically placed windows and doors.	19	23	30	80	44
Shading Devices	The hospital have overhangs, eaves, or awnings that shade windows from direct sunlight.	18	20	26	54	61
	Trees or other vegetation are planted around the hospitals to provide additional shade.	12	14	8	105	40
Smart Technologies, materials and construction	New technological process reduce time in the production of goods and services	17	15	5	106	36
	Access to internet increase customer patronage	27	35	5	71	41
Windows for lighting and ventilation	The current political Environment is not Friendly to business to business activities in bauchi metropolis.	21	66	4	37	51
	The government in place has contributed to the growth and development of small scale business	31	20	7	69	52
Landscaping features	There are courtyards or open spaces within the hospital units that promote air circulation.	32	37	9	67	34
	Water features like ponds or fountains are present in the common areas to provide evaporative cooling.	16	12	6	52	93
	Hospital users are happy with the landscaping features	12	18	8	51	90

Source: *Field Survey Data, 2024*

From table 4.7 in response to external environmental factors and the performance of small scale business, the responses showed that the responses were well distributed on the likert scale. This portends that of all the dimension of the variables was of positive effect to the performance of small scale business.

Conclusion

This will cover various aspects of design, taking into account the cultural and contextual considerations, specific context and needs of Akko Local Government Area, Gombe state. By incorporating EBD principles, the maternity healthcare facility in Gona District can be a model of patient-centered, culturally appropriate, and sustainable healthcare architecture. This approach not only addresses the immediate needs of maternal care but also contributes to the long-term health and well-being of the community.

Recommendations

i. By adhering to these evidence-based principles, the maternity healthcare facility in Gona District can become a model of excellence in maternal and child health care.
ii. By following these recommendations, the maternity healthcare facility in Gona District can be designed to provide high-quality, culturally appropriate, and sustainable care for women and children in the region

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