

Evaluation of Space Management in Isolation Centre (A Case Study of Infectious Diseases Isolation Center Yaba, Lagos State)

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Abstract- *The danger of infection and the pathogen's level of hazard led to creation isolation rooms to avoid the spread of airborne transmitted diseases. The majority of designs minimize transmission between people within and outside the space by using pressure relationships. A very well ventilation system is utilized inside the room to quickly remove infections and avoid places where there is a higher concentration of contaminants and where an individual, such as a health professional or a guest, might be exposed. This research outlines the methodology for evaluating an isolation room's infection control features; both qualitative and quantitative strategy was employed in this study. Interviews and case study was carried out at the infectious diseases isolation center yaba, Lagos. The data gathered from the research methods was thoroughly analyzed and this shows that FMHD published several guidelines for existing and newly created isolation centers for effective space planning and management. This study also shows the result from the six respondents interviewed, with more than 50% agreeing that effective space planning can reduce the spread of infectious disease. This study suggests the urgent need for the isolation center to adhere to the NCD & FMHD design guidelines which serves as the parameter for a properly planned disease isolation centers.*

Indexed Terms- *Isolation, space, FMHD, guidelines, NCD*

I. INTRODUCTION

- *Importance of the research*

The aim of this research is to evaluate the space management in isolation center taking the infectious diseases isolation center Yaba, Lagos. The researcher would be engaging the following objectives in order

to accomplish the stated aim: To access the NCD and FMHD standards for isolation center, to examine the space allocation and space management in the study area/ case study and to evaluate architectural solutions to the space management challenges.

- *Background/ Current understanding*

Isolation centers origin can be traced to the 1740 when there was need for a separation of general hospital and centers for chickenpox; however, center for special diseases was created in 1801 and they were referred to as fever hospital (*Isolation (health care)*, 2022).

A fever or isolation hospital is a place where people with contagious diseases like scarlet fever and smallpox can be isolated. Their purpose is to isolate those who are affected from the rest of society while treating them. The Liverpool Fever Hospital (1801) and the London Fever Hospital were early instances in England (1802) (*Low*, 2020)

The first hospital specifically for smallpox was the London Smallpox Hospital, founded in 1741. The Liverpool Fever Hospital, established in 1801, was the first specialized hospital for various infectious diseases. Fever hospitals or "houses of recuperation" were established in several key places, including Chester, Hull, London, Manchester, Newcastle upon Tyne, and Norwich, these were mostly used to treat typhus, which was widespread at the time (*Fever Hospital*, 2022). By 1879, out of a total of 1,593 local authorities, 296 (or around 18.5 percent) have some form of system in place. As the biological theory and the origin of infection became more widely accepted, more fever hospitals arose, eventually becoming the most common type of hospital by 1914. In the twenty-first century, the idea of a hospital specialized to isolation and care during an emergence of an

infectious illness is still important, to the degree that public health initiatives cannot eliminate the possibility of outbreaks(*Design wiki, 2022*).

In the year 1899 the first infection disease hospital and medical research center was created in Lagos due to the outbreak of smallpox and in the year 1923 another center was created in Abeokuta.

II. METHODS AND MATERIALS

During this study, the use of both the Qualitative and Quantitative was adopted. Also, Interviews were employed for data collection. The quantitative strategy entailed the acquisition of numerical data for measuring statistics gathered, whereas the qualitative approach provided a better understanding of the underlying causes and various opinions on the research.

The research also combined the use of both the Primary and Secondary methods of sourcing for data. The primary source employed for this study included the interview and case studies while the secondary data collection was from journals, published articles and the internet.

- Interview

The target population will include staff working in the isolation center which include medical doctors, Nurses, other non-medical staff and discharged patient

- Case Studies

This involved personal visits to the selected isolation centers, checking out all necessary information as regarding the facilities, this visit is expected inform and educate the researcher on every other aspect missing.

- Literature Review

This involves getting information from different books, e-books, periodicals, articles, newspapers, journals, etc. The researcher examined and extracted the information pertinent to study while citing the article's author.

III. RESULTS

The data gathered from the survey methods are thoroughly analyzed; including the respondents' choice to have their responses visualized using a bar chart. Descriptive analysis was used to offer the discussion of research findings gained through organized interviews. These are supported by numerical figures where appropriate and include on-site pictures for reference.

NDCD & FMHD Design Guideline: The Federal Ministry of Health Department of Hospital Services (FMHD) issued several guidelines for existing and newly created isolation centers for the wellbeing of the patient and the medical staff. With these guidelines comes protocol for assessment and accreditation of all isolation centers all over the country, certain criteria must be met as regarding Space management, Circulation spaces, Access control, Ventilation, Facility capacity and Patient room design(*Health, 2020*).

- Space management: Separate rooms for patients or areas amenable to isolation of patients with minimal construction Single pass (non-recirculating) ventilation for each room or isolation area.
- Ventilation: The facility should be generally well-ventilated.
- Access control: Feasibility of controlling access to the facility and to each room.
- Facility capacity:Facilities for accommodating staff, facilities for collecting, disinfecting, and disposing of infectious waste, facilities for collecting and laundering infectious linens and clothing, facilities for patient evaluation, treatment, and monitoring.
- Patient room: Rooms should be adequately ventilated and maintained at negative pressure relative to the outside or corridors using mechanical or natural ventilations if possible(*CDC Prevention Guidelines Database, 2016*).

Interview: The respondents' information was summarized in Table 1.1, which eventually provided an abstraction of their perspective as it is stated in the segments that follow.

Table 1.1: Table of Respondent

	RESPONSE	FREQUENCY	PERCENTAGE
SEX	MALE	4	66.6%
	FEMALE	2	33.4%
AGE RANGE	18-30 YEARS	3	50%
	30-45 YEARS	2	33.4%
	45 ABOVE	1	16.6%
CLASSIFICATION	STAFF	4	66.6%
	PATIENT	1	16.7%
	VISITOR	1	16.7%
		6	100%

Source: Author's compilations report 2022

Table 1.1 displays the demographic data of the respondents, according to the results, 66.6 percent of respondents were adult males, 4 out of six (66.63 percent) were staff working within the premises within the age range of 18-45.

The study likewise wanted to understand respondent's knowledge regarding the NDCD and FMHD design guidelines for isolation centers. This was done using interview medium and presented in figure 1.1. The chart shows that 75% of the respondents have heard about the NDCD & FMHD design guideline for isolation facilities, while up to 70% of the respondents are quite familiar with the design guidelines to some reasonable extent.

Figure 1.1 also presented the study with the rate at which respondents agree with the guideline with about 40% agreeing it is not totally applicable to their facility due to the fact that it is an existing center.

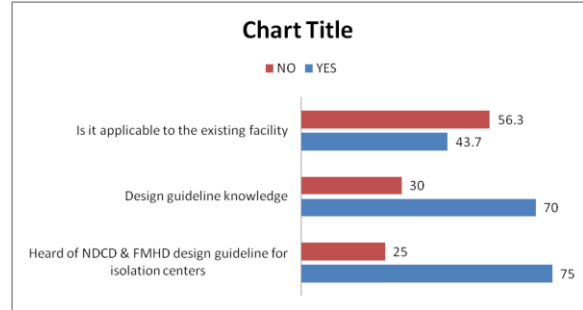


Figure 1.1: Picture showing the knowledge regarding NDCD & FMHD design guideline (source Author's compilation report 2022)

Efficiency of space planning: This study gathered information concerning the efficiency of space planning within the isolation facility. 69% believe that space planning can be efficient in reducing the spread of infectious disease, 31% believe that it may have no effect regarding the spread of diseases within the facilities while 9% were neutral.

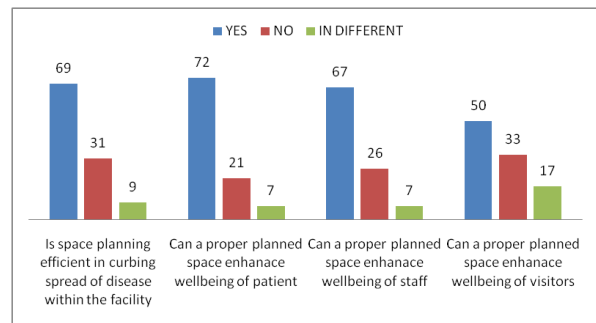


Figure 1.2: Picture showing the Efficiency of space planning in curbing spread of disease (source Author's compilation report 2022)

- Case study: The Infectious Diseases Isolation center is a public hospital, formerly known as the Yaba's Mainland Hospital which provides high-quality medical treatments for a variety of infectious diseases while ensuring accessibility and cost (Mainland Hospital, Yaba, Lagos., Dec).



Figure 1.3: Picture showing the patient ward/ quarantine wing, at the Infectious Diseases Hospital Yaba (source Wikimedia Commons 2022)

- Evaluation of the spaces

The spaces allotted for isolation at the Infectious Diseases Hospital is not so different from the space allotted in other developed countries, it is advisable for single en-suite isolation room to have its own ante room (Brett G. Mitchella, 2017).

According to the guidelines released by NCDC and FMHA the rooms are supposed to be Negative pressure air, one of the requirements for negative pressure rooms is for the rooms to be En-suite (Marier, 2015).

The quarantine is demarcated to reduce the spread/ transmission of disease or virus from one patient to another, quarantine is usually the first space a patient is stays to determine if he or she is positive or negative. In the course of waiting the patient should be restricted from other interference through proper separation segmentation, patients are allowed to have contact with one another which takes away the idea of being in a confinement but pose a larger risk of the spread and transmission of the virus.

The creation of a nurse point in the quarantine wing is an applauded addition that will enhance the steady monitoring of the health status or conditions. For patient in negative and positive rooms, under no circumstances should they share a common ante room due to the severity and the nature of the virus transmission which was highly maintained.

Table 1.2: Table of Evaluation

	SPACES	EVALUATION OF SPACE		
		GOOD	FAIR	BAD
1	ISOLATION ROOM	√		
2	QUARANTINE WING		√	
3	ANTE ROOM			√
4	NURSE	√		

Source: Author's compilations report 2022

This table shows the evaluation of space by the interviewed correspondent and the case study carried out.

IV. DISCUSSION

Using NCDC, Yaba as a case study, this research investigated the effects of outbreaks on spatial planning, wellbeing, and behavioral change. Six (6) individuals were interviewed using a semi-structured format to look at their perspectives and ideas.

Each significant pandemic of an infectious illness has given rise to fresh concepts, procedures, and design guidelines. These pandemics frequently give authorities a strong reason to promote healthy design guidelines for the safety of the general public.

This research has revealed that it is important to have a proper planned space with the collaboration with design guideline as the basis for every space within the isolation facilities. The creation of new spaces that are not in the existing facilities is very important, because these spaces were created as a form of security check towards the disarming the spread of infectious diseases (Micheal, 2022).

CONCLUSION

This research project has greatly revealed the importance for a properly planned space. It is therefore recommended that.

- a) Patient's room should be designed to follow the current design guidelines.
- b) The quarantine wing should be redesigned to follow the current design guidelines.

- c) Every room should be properly ventilated and (naturally and mechanically).
- d) There's a great importance for ante room before the patient room to curb the spread and growth of infectious disease.
- e) Glass perplex should be introduced as barriers or demarcation between beds in quarantine wing, use of mechanical vent should also be used.

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