

Exploring the Perception of Patient on Sustainable Healthcare Design Indicators

¹Baby Jamzadilalarukh, ²Sabeen Qureshi, ³Jveria Manzoor Shaikh

^{1,2}Architecture, Mehran University of Engineering and Technology, Pakistan.

³Architecture, Nazeer Hussain University, Karachi, Pakistan.

Abstract - The aim of this paper is moderate the stress and confusion and the disturbance of patients, This article help us to control stress and reduce trouble in the movement of patients and this will be achieved with the help of Quality Function Deployment (QFD) also Zero defect QFD tool has been used for this study to assess accessibility, connectivity, barrier free way of finding for senior citizens and disable patients and check the facilities for patients like parking and waiting area also assess over all walkability in the hospital building and its surroundings. In this regard two case studies has been done. i.e., Jacobabad Institution of Medical science and Liaquat National hospital and Medical College. In case studies a Design Determinant's demonstrating proceeding Excellence Function Deployment (QFD) and House of Quality was approved accessible. To achieve healing environment the Areal distribution within hospital buildings and Spatial Organization studies has been done based on zero defect model has been assessed for this study. This study findings shows Corridor's Connectivity simulates 84% improvement in movement in Liaquat national hospital. Grid allows enhancement By 44% in Barrier Free (Visibility), Orientation (Way finding) and Vicinity (Walkability).previously and afterward origination of research.

Keywords: Space Syntax, accessibility, connectivity, barrier free way finding, walkability.

I. INTRODUCTION

Hospital building occupies exceptional place in society, these studies providing a basis for empathetic the path towards improvement of sustainable Healing Atmosphere within hospitals. To envision and explore the position of sustainable healing atmosphere in hospital Buildings in Sindh and the behaviors and resources to expand them. Several tools and Performances remained similarly reconnoitered in this concern to assess the hospitals and case studies were accompanied in Sindh to see the accomplishment of sustainable healing environment within hospitals from initial stages of design to ending product.

This research deals with the design determinants, spatial organization and areal Distribution in hospital buildings.

In this paper the author visualized and analyzed sunlight design and its effects on troposphere within hospitals, the nurse walk path and reducing the horizontal travel time of staff in hospitals to achieve connectivity and direct barrier free accessibility and the process of efficient care giving to patients in the hospitals. The quality of received care is mainly dependent on kind issue; development of health care services. (Wilhelmsson S, 2010) It is important to assess the quality of hospital and staff so they are highly needed to increase their quality care (Akkadechanunt et al, 2009).

The communication skills and inter disciplinary collaboration of hospital staff satisfied the patients and specially the nurses listen to patients badly-behaved and take time to provide them information (Abualrub RF et al, 2009).

Among the quality services provided by hospitals patients waiting time at hospital is also an important indication (Maxwell). The strategy that in was accessing the quality of healthcare services include basic standards parking, barrier free way of finding connectivity, accessibility, waiting area, services, labeling (Zhao SH, Akkadechanunt T, Xue XL et al, 2009).

II. LITERTURE REVIEW

Maintainable Healing condition idea created in mid19th period which demonstrates treatment of circumstance to be wellbeing giving. (Nightingale, F. 1859) In next one period the idea thorough and it was exposed that in instruction to generate sustain restorative condition it desires the use of eco-friendly abilities such as nonviolent coolness, warmth and coziness, cleanliness, clean air and suitable light points which help a patient to recover. In 1960's, the idea of manage mending conditions got logical supporting through Evidence-based design. By mid 1980s Roger Ulrich made major indication founded inquiry on bear healing situation by identification of the consequence of built atmosphere on patients.

a) Definition of Hospital Buildings in Pakistan:

There is no single definition to assign the healing centers structures in Pakistan as the nature and size of such structures varies to more prominent degree from one room poly facility to substantial scale tertiary level clinics. Thus, this examination depicts roughly uniqueness of human services development and apply concept of interaction of health-giving spaces in architecture of hospitals in Pakistan.

b) Concept of Hospital Buildings:

As most of these specialists identified the best hospital in Pakistan concerning curative environment as (LNMH) LIQUAT NATIONAL MEDICAL HOSPITAL and Healthcare Facilities in Karachi designed and developed by a foreign architect.

c) Definition of Design Determinants:

The concept of design determinants for healthcare facilities was first established by Kobus in the year (2008). Kobus defined the design determinants in terms of building typology prototype for healthcare facilities by an area mapping mechanism that describes the design determinants in terms of best pattern for delivering care. Thus purpose of design determinants calculation is upgrading the level of community blending with the hospital facility raise community superiority. Design healing environment in hospital building by providing patient-centered care. House of Quality is the name of the matrix where roof-like triangular structure is at the top part. Later the analogy is in procedure of a house which is divisible into chamber like spaces.

d) Spatial Organization:

Cummins et al (2007) explains about understanding ‘place’ in health research from relational approach for measurement of potential spatial organization. These spatial ingredients may be localized and then applied to the current Pakistani healthcare setting. Khan (2010) and Ahmad (2013) examined and analyzed the synergies from a barrier free perspective for spaces used by accessibility challenged users.

e) Definition of Areal Distribution:

Areal distribution is defined as schematic design or roughly bounded part of the space on a region e.g. bubble diagram. Holst (2015) while his study to optimize the efficiency of Hospital Layout where the bipartite significant determinants for areal distribution planning specifically for the provision of health care facilities are the criterion concerning patients for selection of hospital emergency departments and catchment ranges information.

III. CASE ANALYSIS

a) Case # 01: Case study of Jacobabad Institute of Medical Sciences:

The case study of Jacobabad Institute of Medical Sciences which follows the bubble diagram as shown blow in figure at micro level and the following design on macro level. The following design determinants are followed in the hospital of Jacobabad.



Figure-3.1: Bubble Diagram of hospital building

1. Skill to grow and change in repose to future needs as shown in figure 3.2The aim in planning should be to reduce to a minimum, physical inhibition for future unforeseen growth. Which is the chief principle of design for the Jacobabad Institute of Medical Center.

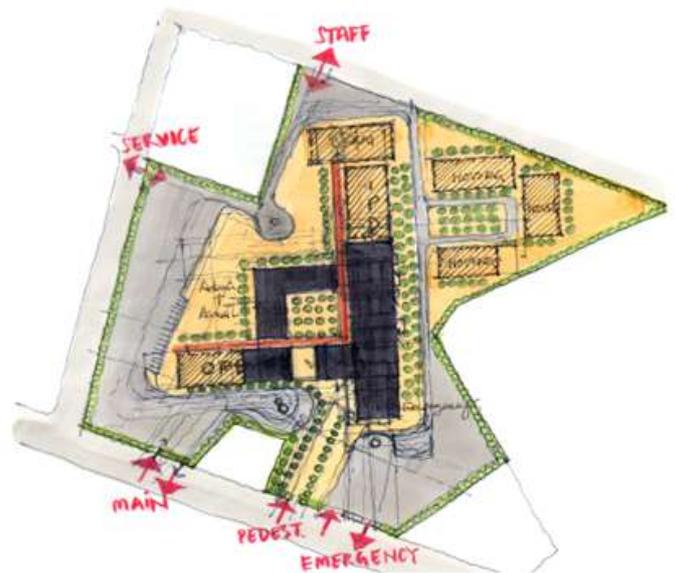


Figure-3.2(a): The main circulation and usefulness

- Development of movement and effectiveness arteries. The main circulation and usefulness distribution system in a hospital should be conceived in three dimensions as shown in figure 3.3. Generally, maintaining a rectilinear pattern provides the greatest amount of flexibility, from connectivity perspective. As shown in figure, and the plan is merged on a grid design which is orthogonal therefore the plan provides the greatest amount of free serviceable space. The circulation zone is visible in yellow colour, which connects the primary zone to the road for vehicular circulation as shown in figure.



Figure-3.2(b): The main circulation and usefulness distribution system



Figure-3.3: Maintaining a rectilinear pattern provides the greatest amount of flexibility, from connectivity perspective

- Separation of numerous kinds of traffic, unimaginative from vehicular and patient, staff, visitor service from each other.
- Here room standard for eight patients is used for

prototype module, and toilet size acts as a repetitive factor thus improvement of modular spaces, to provide maximum flexibility. Room sizes are seldom so critical that a variation of 10 % to 20 % will not make any difference in their usefulness if a module can be developed that is acceptable for a larger variety of occupancies.

- Careful consideration to orientation is studied and applied now sun control and building material according to the local context of Jacobabad is used. The development of air conditioning and artificial illumination has a significant effect on hospital design.

b) Case #02: Liaquat National hospital & Medical Center:

Liaquat National Hospital & Medical College covers a vast population. Even people from far off provinces seek here, for the superiority treatment and all the facilities are available. It is completely functional, app 1000 bed hospital, serving thousands of patients per month rotund the clock, managing the work in three shells, (8–2pm, 2-8pm and 8-8pm) and all of modern equipment is available and operational along with the attendances of the staff.



Figure-3.4: Liaquat National Hospital & Medical College

The principal benefits of the horizontal scheme manifest in the planning. As chief function of every hospital is to serve the human being. Structure is human habitat and hospital is habitat for suffering people. The way we design, contract, and operate the hospital buildings has a profound impact on our health and the health of our environment.

a) The evolution of the plan of LNMC:

As the site plans shows that the circulation of this hospital was problematic due to in efficient connections and inappropriate pathways thus a humongous revision took place to redesign the entire building while uplifting of smokescreen

was also incorporated. As it is highly evident that designing a new hospital is rather much easier than revising a functional public center hospital located in the heart of the city.

b) Tool of Analysis:

This chapter of analysis for Liaquat National Medical hospital is designed in two distinctive scope: one is macro level analysis of site planning and second is micro level planning of ICU. Therefore the research posed two fundamental questions:

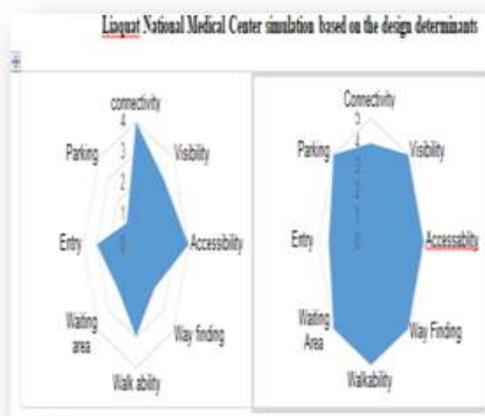
1. What specific innovations of efficient circulation could be made to improve care delivery- and at what cost?
2. Translated into efficiency (Kaizen) Continuous improvement: how much more productive, and how much less dangerous to patients, would healthcare delivery be?
3. The design innovations and their costs were organized into four categories.
 - i. Efficiency and Effective Circulation(Macro Level)
 - ii. Indoor environmental quality (IEQ) Micro Level
 - iii. Operational efficiency
 - iv. Infection Control



Figure-3.5: Master plan proposal (2006) buildings are shown in brown color



Figure-3.6: Master plan proposal (2009) buildings are shown in white color



(a)

Parameters	Value	Parameters	Value
Connectivity	4	Connectivity	4
Visibility	3	Visibility	5
Accessibility	4	Accessibility	5
Way Finding	2	Way Finding	5
Walk ability	3	Walkability	5
Waiting area	2	Waiting Area	5
Entry	3	Entry	4
Parking	1	Parking	5

(b)

Figure-3.7(a), (b): Before and after the analysis and intervention

IV. ARCHITECTURAL DESIGN RECOMMENDATION

This is the live project initiated to apply the lessons learned from this whole research on improving of health-giving environment in healthcare facilities with an appropriate spatial organization, design determinants, and aerial distribution.

The process of the proposed hospital project began by identifying the needs of the community that developed in the outlying areas of Karachi. As currently new developments are going on in the periphery of Karachi.

There occurred many low income and high income expenditures and they needed the hospital as the main hospitals of the city are in city center and are quite away on around one hour drive. Consequently a site is identified on the main super highway leading from Karachi city to Hyderabad which is another city 150 km away.

a) Site Analysis

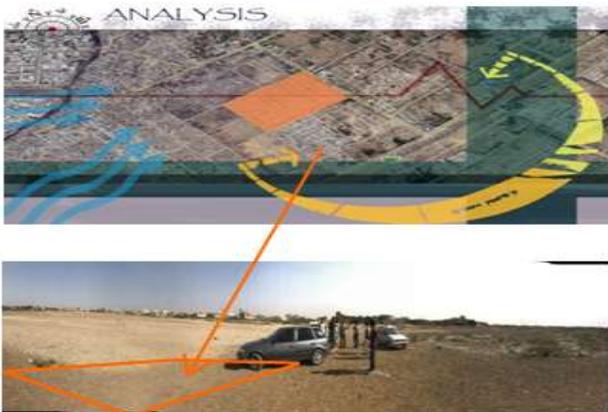


Figure-4.1: Site analysis

b) Location of Site Analysis

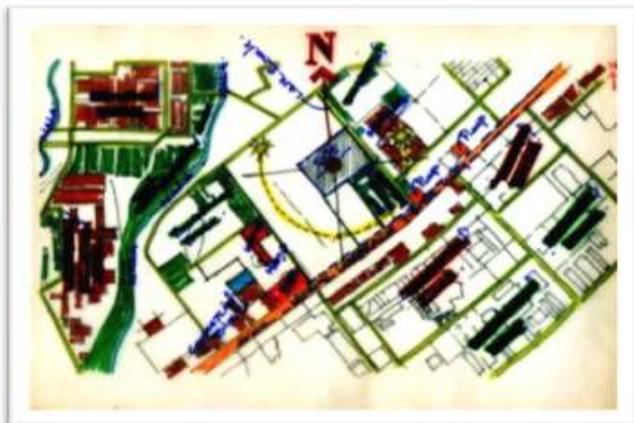


Figure-4.2: Location of site Analysis

c) Site location

The proposed site for hospital is located around 30 km away from the city center of Karachi in the north side. The community land reserved for amenity facilities was chosen to make the hospital. In this regard applied for foreign funding to develop the hospital and this land is acquired in the suburbs of Karachi.

The proposed final plan of building

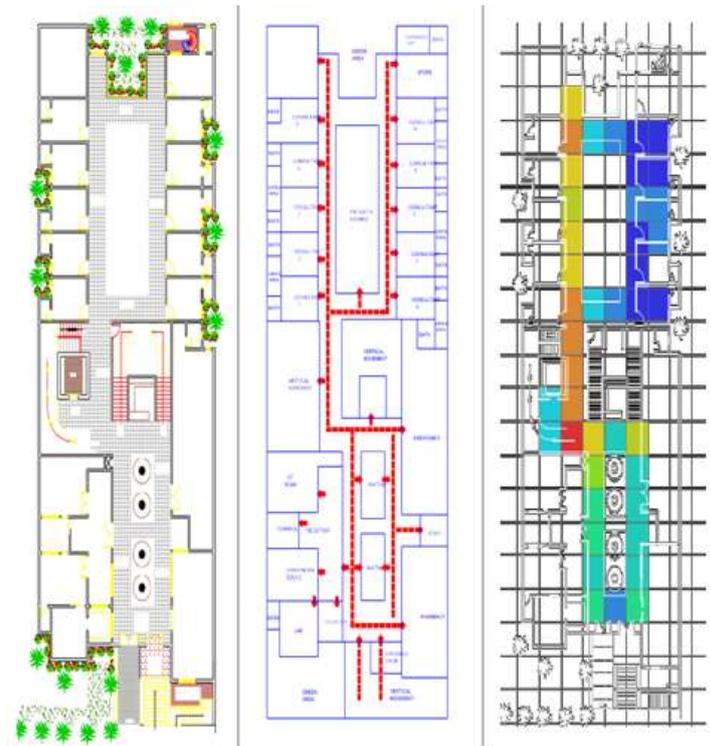


Figure-4.3: Proposed Final plan of hospital

V. CONCLUSION

The major investigation of healthcare accommodations in Pakistan in relative to sustainable health-giving atmosphere enhancement of spatial Organization, Area Distribution and Design Determinants with the purpose near developments based on exploration points. If we need to eliminate all sorts of wastage of interplanetary in hospital and difference of space. The aim of the research was to “improving healthcare facilities in Sindh by accumulation healing environment established on design determinants, spatial organization, and areal distribution”. Whole quality tool helped this research to simulate all three aspects which studied. Fish bone analysis short listed the design determinants.

A 75 % improvement was simulated when the design of Liaquat was redesigned applying all the listed determinants for design, whereas a 54% improvement was measured.

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