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# Architecture for Healthcare Facilities

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**ABSTRACT:** The development of any nation majorly depends on the well-being of its citizens. As the cliché goes 'Health is wealth', The most significant luxury that one, as well as any nation, can hold is good health. A country's economic and social growth broadly depends on the sustainability and viability of its healthcare sector. Any country around the world cannot maintain steady economic growth in the absence of an adequate healthcare system. The study tries to understand the elements, philosophies, and spatial as well as the sensorial aspects of healthcare architecture. The focus here is to decode the importance of healthcare in humans through the study of spatial design in a healthcare facility. The focus here is to understand the role of spatial elements of Architectural design in the process of healing the healthcare condition of a human in a hospital. Also, the study tries to understand the impact of various architectural elements on the psychology of a patient.

**KEYWORDS:** Architecture, Health, Facilities, Patient, Spatial.

## I. INTRODUCTION

### A. *Healthcare and Indian Scenario*

According to the Global Health Expenditure Database 2016 of WHO, Indian healthcare expenditure has shot up substantially in the past few years, it is still very low in comparison to the peer nations. The public expenditure on health as a percentage of GDO for 2017-2018 was a mere 1.28% of GDP[1]. India ranks 170th out of 188 countries in domestic general government health expenditure as a percentage of GDP. However, amidst the novel coronavirus pandemic crisis, the government has increased the spending on health care but it has become necessary to increase this spending to not only address the ongoing strange health crisis but also to ameliorate any future pandemic conditions. The public segment has tried investing in the same, but a tragic boom has been noticed in the private sector. There are various healthcare facilities that have been recently developed in both sectors. Hence the most important building in the nation, one can find is a hospital, which caters to the patients suffering from diseases and is healed. Due to this process of healing and recovery, Healthcare facilities are given the utmost importance.

### B. *Healthcare Architecture*

The Segment of Healthcare architecture has become significantly diverse, by not limiting it to only government hospitals, but development has been seen in various private multispecialty hospitals, wellness centers, resorts with state of class facilities to provide better healthcare. Clinics, dispensaries, and mobile dispensaries have also been introduced. With the increasing population and their indulgence in using medicines for illness, it has become an important aspect to cater to the needs of the people. Towards designing and developing the state-of-the-art health centers not only focus on having aesthetic enhancements (to reduce stress and anxiety) but also make a deliberate effort towards promoting patients' health. Such spaces can be a medium for imparting sentiments, i.e., the positive aura that brings the change in the patients' perception to the space and improvise their mood[2]–[4].

### C. *Importance of Healthcare Architecture*

Individuals' life may be improved by the design and layout of a healthcare facility. The modern medical treatment facility idea is shifting far from boring interiors and toward the perception of light and color. Spaces affect patients' moods and body self-image in this manner. In fact, it may help patients heal faster. Previously, the architecture of such institutions was more concerned with helping clients' healthcare practitioners than with the patient populations directly. Many choices taken in the architecture, implementation, and administration of the facility established the maximum quality of services in the various healthcare institutions. These structures are not just magnificent, gorgeous exhibitions of architectural created for humans, but they are also utilitarian. Natural light, outdoor landscapes, and tranquil, hygienic chambers for patients are all architectural features that contributes to a great patients' satisfaction. With outdoor and interior plants, glass windows for appreciating sunlight and the environment, and utilization of organic types of wood and rock, architecture investigations have striven to introduce environment nearer to the patient's perception[5].

Accommodations which are not created with client in mind, on either side, may be quite unpleasant and upsetting to those who seem to be presently in a vulnerable position. Providing a calming atmosphere should be a focus for clinics and

treatment facilities since it has been established that lowering tension reduces the length of patient' stay. The functional emphasis of hospital design has shifted, and hospitals are now envisaged as a collection of spaces that try to provide healthy experiences, rather than a building housing health. The objective is to enhance internal processes in which many parts of the hospital participate, resulting in increased efficiency and perceived quality by users. In this regard, planners for new hospitals undertake strategic design workshops where they gather compelling ideas for investigating how to incorporate interdisciplinary areas for co-creation into future hospitals. It is critical to achieve precise alignment between organizational and technological components, while also keeping in mind that each function deserves its own area[6].

For example, very specific critical service processes are being studied in terms of improving on what those who gain from efficiently separating sanitary waste, optimizing the cleaning process in operating theatres, factual info for health - care professionals, or the accessibility of electro-medical substance associated with the maintenance. The combination of patient, health workers, and other employees in a flexible facility that incorporates the environment, lots of light, sustainable sources, and cutting-edge technology exemplifies the unique characteristics of twenty-first-century hospitals. The study aims to discover how architecture and aesthetics together can create an environment that can help in the healing process. By decoding the realms of architecture which along with the manipulation in the spaces and aesthetics, act as a catalyst in the physical and psychological positivity of the patient. The two major aspects of hospital design are the spatial and the sensorial aspects which are to be considered for the wellbeing of a patient.

#### ***D. Spatial Aspects***

The Spatial Aspects of a hospital are basically the physical aspects of the building, that shall be involved in the various functions like the overall circulation in the hospital, the services, Outpatient and Inpatient wards, the operation theatres, etc. that are provided for the proper treatment and diagnosis of the patients. The circulation passages and the waiting area are the entities that shall cater to most of the movement in the hospital and hence should be designed considering the floor heights and the openness. The scale and the proportions of the spaces must be designed such that there is no sense of claustrophobia or narrowness[7].

#### ***E. Circulation***

The key to hospital planning is its circulation. The most initial and important thought process for hospital planning should be its circulation, as it is the most importantly used service by all the user groups. The Circulation in a hospital is such a space that is accessed by the patients to be shifted from one ward to another while by visitors and doctors, nurses. This is the most used service, in which the movement of the people and the patients is to be taken care of. Avoiding infections and the spread of diseases is a must. While keeping in mind the sizes of the passages from length to breadth, the width of a wheelchair or a stretcher should be easy to move.

And the length must be such that the wards and functions are distributed distinctly at the same time, one does not have to travel long distances. The integration in the spaces with context to the circulation area leads to efficiency in the usage capacity. The distances to be traveled should be designed such that there are the shortest routes to travel. This not only eases the walking distances but also saves a lot of money and time. This is the only entity that separates the dissimilar functions from one another and at the same time makes them easily accessible from the other side. While designing the spaces the ventilation should be taken care of. The openness in the passages should be provided. The use of paintings or informative readable' or positive quotes must be displayed on the walls[8].

#### ***F. Waiting Area***

The first area one accessing in a hospital in the waiting area, either waiting for consultation or for a relative. This is the place where one is in the most traumatized situation, hence the planning of this place must have a sense of openness and with cool and light colors that may lessen the sense of nervousness. The OPD and the reception must be in proximity. The waiting area can be planned in a way that it has overlooking green spaces or a courtyard nearby. The furniture must be designed to provide comfort to the patients, to be able to sit for long hours. The intent of the space is to cater peace and comfort to the patients[9]–[12].

#### ***G. Importance of Services***

Being an amalgamation of a number of services, right from the reception to admitting the patient, to various services of transporting the patient, to provide the services for treatments, food, and also technical services like for vertical transportation, HVAC, Laundry, and Linen services, Housekeeping, etc the hospital caters them all. The services are also a crucial part of planning hospitals, because while planning the rooms and the central spaces, the consideration for the oxygen pipes, the vent areas, the patient's lift, etc are to be taken care of. As a precaution and an essential part of service, the fire safety and alarm system are also to be provided. The Out Patient Department (OPD) is referred to the patients that visit for consultation or diagnosis of their ailment. These patients visit the hospital for the examination of their disposition and have a certain time and path of traffic within the premises. The laboratories, X-ray rooms, waiting lounge, etc. The medical store and the canteen should also be in proximity, to avoid hassle and traffic. The In-Patient Department is referred to the patients that are admitted to the hospital. The services to be provided for these patients are varied, as of oxygen for all the patients' beds, provision of nurses for their timely treatment, and at the same time, keeping the spaces sterilized and inaccessible for the random visitors. The elevators should also be provided such that they are easily accessible to the entire floor, cutting the travelling distances[13].

#### ***H. Sensorial aspects***

This segment discussed about the sensorial aspects of hospital design that are perseverance through the senses. This affects the healing process as well as the proclivity

towards the space, and the hospital in this context. The word hospital itself shoots anxiety in one's mind, but the fact is that it is the same place where one gets treated for all the indisposition and the anxiety related to it. A few points shall be discussed here that helps in the acceleration of the healing process and are also helpful in the architectural realms[14]. Firstly, The Entrance, of the hospital should be welcoming in a way, through its grandeur. High lintels and huge doors, with a wide-open patio and some greens in the frontal, may calm down one's anxious mind and develop a sense of positivity towards the treatment. The smell of sterilized corridors and hurt/wounded patients being transferred should be avoided. Easy demarkations and signages towards the wards must be mentioned clearly, to avoid unnecessary traffic at the reception or the help desk. The Aesthetics of a space impacts largely on a person's psychology. Cool and light colors develop a sense of calmness in the mind. Dark colors give a sense of tension and worry to the patients. A good view towards the greens or an open area develops the sight of relaxation in the patients. Plantations in the window sill or lush green courtyard provide fresh oxygen as well as lessen the nervousness in the patients. One of the most abundant resources and with a high impact in-patient recovery is daylight. Daylight is important but there is a need to have controlled penetration of the same within the spaces. There are many factors that will determine the light situation in a project and are needed to take them into account. The ventilation in the hospitals is mainly mechanically controlled, but visual connection is equally important.

**II. DISCUSSION**

There are six trends that are required important for the architecture of the health care system as shown in Figure 1.

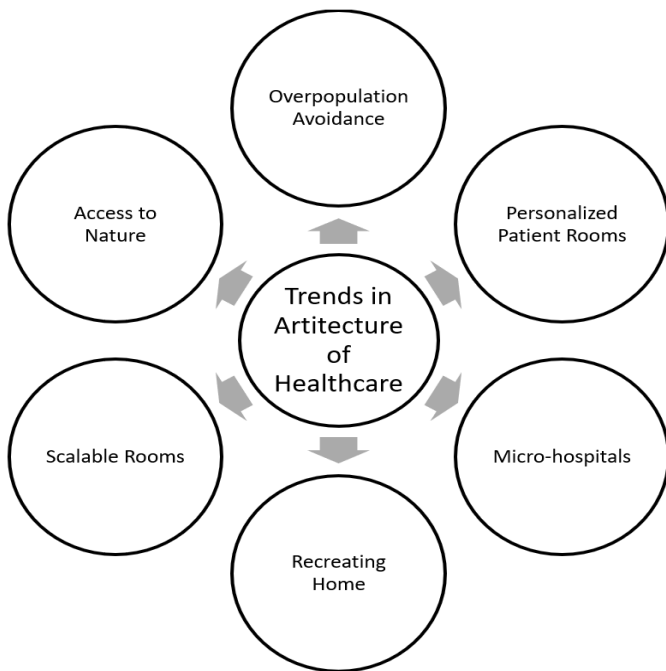


Figure 1: Illustrating the Six Trends that are included in the Architecture of Healthcare System

Overpopulation Avoidance: The last thing a patient wants is to experience crowded as a result of over-crowding. Overcrowding is often caused by floor layouts that do not fully allow for efficient traffic movement. Expecting overpopulation by using each inch of space of a house's design and optimizing capacity may go a long way toward helping a patient feels a lot more relaxed while also providing doctors with ample area to execute their duties. These concerns may also be alleviated by properly situating patients sub-waiting spaces and welcoming family and friends. Personalized Patient Rooms: Whenever people are put in a new setting, customization may be quite significant for their wellbeing. While at a health care institution may be stressful at times. As a result, healthcare design is increasingly striving to enable for even more individualized client chambers in order to minimize stress and improving happiness. In health-care institutions, features such as patient engagement panels and customizable electronic signs with the medical form, relatives' photographs, temperature predictions, and many more are being implemented. Micro-hospitals: The number of small-scale inpatient institutions is increasing. Such micro-hospitals have an ER, pharmacies, as well as laboratory, as well as radiography, surgeries, as well as other facilities offered in medical centers. What are the advantages of starting small? For the convenience of patients, these institutions give convenient accessibility to a broad range of health treatments. These are close to towns, minimizing the necessity for patients to commute to bigger clinics located beyond their towns. Recreating Home: It is frequently difficult for individuals, particularly those admitted for extended layovers, to remain calm at a health system. It's simple to understand because whenever you gaze at standard hospital architecture — white walls, pastel hues, florescent lighting, and antiseptic materials. To facilitate patient satisfaction, buildings are being constructed to become more welcoming, with softer art and colour schemes, wider window to permit for further natural daylight, and furnishings that feels and looks very much like home decoration rather than the harsh, industrial alternatives of the past. Scalable Rooms: Because clients can have many more guests at the same time, hybrid goods such as sofa beds and rockers may help ensure that caretakers and guests have had the space they want, whenever they need it, without cluttering the room. As previously said, overpopulation avoidance is a crucial priority in hospital design, and using foldable furnishings is a simple design choice for getting health architects function for a variety of patients and their visitors. Having family and friends nearby during recuperation may make a significant contribution, and so this tendency makes that easier. Access to Nature: Hospital design that's also purposely constructed to provide people with a sight or accessibility to reunite with environment may be quite beneficial in relieving the pressure that comes with someone in a health institution for a prolonged period of time. Flowers, live vegetation, and many huge windows to lush greenery, bushes, and shrubs lighten interiors and create a feeling of quiet & serenity. Furthermore, exposure to outdoors has been shown to improve patient rehabilitation. There is a lot of debate and innovation inside the industry around therapeutic environments, that are intended to reduce

stress and enhance a feeling of health. The design of healthcare institutions has changed in tandem with the advancement of health. Whenever it concerns to planning these institutions, designers are forced to develop which is both aesthetically attractive and functional for clients. Architectural design that's also explicitly designed to help relieve, encourage calmness, and provide relaxation is precisely whatever the physician prescribed.

### III. CONCLUSION

As a summary one can consider the following aspects while designing a hospital. It should be designed with a welcoming gesture, consisting of a sense of normalcy, proximity, and easy accessibility to various wards, and easy findings. The key strategy must be to integrate the architecture with nature, hence creating green spaces like courtyards, open to sky spaces, and plantations in the window sill. Water bodies can be added to the common spaces, which shall develop a sense of relaxation and peace. Creating a homely environment: Increase in social support. Reduced spatial disorientation. Improvement in the patient's privacy and confidentiality. Provision of adequate and proper light exposure. This shall improve the sleep and resting quality of the patients and also reduce the chances of vulnerability towards the ailment. Improvement in the quality and the safety: With a reduction in the medication errors, prevention of the patients mental as well as physical health, along with sterilization and proper planning of spaces to avoid the spread of air-borne diseases or transmission through contact. A proper work environment for the staff is also necessary as the nurses and the doctors are in direct contact with the patients and are the relied service providers. A sustained staff leads to proper and satisfying treatment to the patients. Facilities for the relatives and the family members accompanying the patient should be also taken care of, as it indeed affects the patient's wellbeing.

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