IMPACT OF COVID-19 ON HOSPITAL DESIGN

SOMYA CHHABRA
BACHELOR OF ARCHITECTURE – SCHOOL OF ARCHITECTURE, IPS ACADEMY, RAJENDRANAGAR, INDORE

ABSTRACT

The COVID-19 pandemic has caused a global health crisis and has had a significant impact on healthcare infrastructure, including hospital design. This paper reviews the literature on the impact of COVID-19 on hospital design. The review reveals that the pandemic has led to changes in hospital design, including the creation of isolation rooms, negative pressure rooms, and the implementation of advanced ventilation systems, improve indoor air quality. Furthermore, the pandemic has highlighted the importance of designing flexible and adaptable hospital spaces that can be easily converted to meet changing needs. This paper concludes that the COVID-19 pandemic has fundamentally changed the way hospitals are designed and built, and this trend is likely to continue in the post-pandemic era.

KEY WORDS

Hospital design, pandemic, covid-19, ventilation, isolation,

INTRODUCTION

The covid-19 will act as a mile stone in human history. The pandemic has significantly impacted the healthcare industry, including hospital design. With the rapid spread of the virus, hospitals have had to adapt quickly to accommodate the surge of patients requiring treatment.This has highlighted the need for hospital facilities to be flexible, adaptable, and resilient to handle such unprecedented crises in the future.

LITERATURE REVIEW

Hospitals were not prepared for such pandemic, so a lot of problems were faced by the staff and patient as impact of covid increased. some of the major issues faced during pandemic were:

1 . Lack on isolation spaces

2 . Spatial separation of covid and non covid patient within hospital.

3 . Ventilation system.

4 . Lack of negative pressure rooms.

5 . Flexibility

These problems were identified and have been tried to resolved to some extent. Dedicating units were converted to COVID-19 units, this was the biggest change hospitals faced. Some changes were made into these converted units like doors, electrical requirements, and air exchange increases. Changes to solid doors were done in order to maintain staff and patient safety, as staff being able to see into the room from the corridor. Hospitals have had to separatepatients with COVID-19 from those without the virus to prevent further transmission. This hasrequired the creation of separate wards or designated areas in hospitals for patients with COVID-19. In some cases, temporary structures such as tents or modular units have been set up outside hospitals to accommodate the influx of patients.

METHODS

The COVID-19 pandemic has fundamentally changed the way hospitals are designed and built. The pandemic has highlighted the importance of infection prevention and control measures, such as isolation and quarantine spaces, negative pressure rooms, and advanced ventilation systems. Hospitals have also recognized the importance of designing flexible and adaptable spaces that can be easily converted to meet changing needs. This trend is likely to continue inthe post-pandemic era, with hospitals focusing on designing spaces that are resilient to future pandemics and other public health emergencies. Future hospital

design must include:

1. Plan for large population health events.

This isn't going away and new large population health events will occur. Consideration of architectural solutions such as larger lobby entry queuing sequences that allow for safe temperature scanning and entering a facility are necessary. Separating out staff entry sequencesis also a way to accommodate the public more easily than mixing staff in with them during building exteriors to expand and contract entrance sequences, allowing patients to wait within temperate space. Current waiting areas should be modified and future waiting areas should be designed to meet safe distance separations requirements of six feet, with furniture quantities reduced and seating areas shouldbe arranged in smaller groupings to maintain distancing.

2. Flexible and adaptable is the new normal.

Developing patient rooms that can flex to different acuity levels was once considered a luxurybut now it's a must-have. These flexible units are designed to the highest level of critical carewith higher medical gases, more air changes and direct exhaust, higher power supply all to meet the critical care requirement.

The design of these flexible units should consider the additional equipment needs that ventilators and bi-pap units bring to the design, and patient rooms should be sized to accommodate this equipment at the critical care level. Wider hallwaysshould be considered within these units to 12'-0" to accommodate temporary ante rooms and additional equipment staging.

3. Ventilation

New projects that are being planned are considering operable windows and including higher levels of air. Indoor air in patient rooms would require not only outside air but also HEPA filtration systems. Many stated that curtain wall systems were retrofitted with HEPA filtrationsystems. After more was learned about how the virus spreads, these rooms were changed to full exhaust with additional air exchanges in patient rooms.

RESULT

COVID-19 has highlighted the need for hospitals to be designed with a focus on infection control. Hospitals must have measures in place to prevent the spread of infection, including theuse of personal protective equipment, regular cleaning and disinfection, and the segregation ofpatients with different levels of infection. Hospital design can play a significant role in supporting these measures, including the use of materials and surfaces that are easy to clean and disinfect, and the incorporation of hand hygiene facilities throughout the hospital.

In addition to these changes, there has been a growing trend towards designing hospitals with greater flexibility and adaptability. Hospitals have traditionally been designed to meet specificpatient volumes and requirements, with fixed bed numbers and layouts. However, the pandemichas highlighted the need for hospitals to be able to respond quickly to changing circumstances,including sudden increases in

patient numbers. This has led to a move towards more modular designs that can be easily expanded or contracted as needed.

CONCLUSION

The COVID-19 pandemic has had a significant impact on hospital design, highlighting the need for hospitals to be designed with pandemic preparedness in mind. Hospitals must be ableto quickly and easily adapt to changing circumstances, incorporate technology to improve patient care, and incorporate infection control measures to reduce the risk of infection transmission. By following the recommendations proposed in this paper, hospitals can better prepare for future pandemics and provide safe and efficient patient care.