Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/19499
DOI URL: http://dx.doi.org/10.21474/IJAR01/19499

RESEARCH ARTICLE

THE ROLE OF HOSPITAL DESIGN IN IMPROVING PATIENT RECOVERY

Sagar Phuria
Healthcare Strategist

MicroBachelors in Anatomy and Physiology, SNHU.
MicroBachelors in Neuroscience Fundamentals, Harvard University.
PG Executive Healthcare Management, LIBA (Chennai).
MBA in Healthcare Management, Woolf University, Europe CCGP (RCGP, NHS).
DBA Candidate, Golden Gate University, San Francisco, USA.
MS Cardiology Candidate, University of Buckingham, England.

Manuscript Info

Manuscript History
Received: 18 July 2024
Final Accepted: 20 August 2024
Published: September 2024

Key words:-
Hospital Design, Patient Outcomes, Infection Control, Healthcare Architecture, Evidence-based Design and Healthcare Environment

Abstract

Hospital design is more than aesthetics-it's a clinical tool. From reducing infection rates to promoting faster recovery, well-designed spaces play a crucial roleinpatientoutcomes.

Introduction

Hospital architecture is critical in patient outcomes, transforming from a secondary concern to a primary clinical tool. This shift is rooted in growing evidence that the physical environment directly influences healing processes, patient satisfaction, and operational efficiency. In India and globally, hospitals increasingly prioritise design innovations that enhance healthcare delivery and patient recovery. The rise in patient-centred care, compounded by a need to reduce hospital-acquired infections (HAIs) and promote emotional well-being, has spurred this change.

Corresponding Author:-Sagar Phuria
Address:-reach@sagarphuria.com, sagarphuria.official@gmail.com

A 2018 study by Joseph et al. revealed that hospitals designed with patient well-being in mind saw a **12% faster recovery rate** compared to traditional setups. In India, where many hospitals are overburdened, adopting design innovations can significantly reduce the average length of stay, which is currently **4.2 days** in Indian hospitals, compared to the global average of **6.5 days** (World Health Organization, 2021).

Designing for Health, Not Just Efficiency

Historically, hospital design was driven by efficiency—maximizing bed occupancy and streamlining medical processes. However, recent research underscores the health benefits of design choices that emphasize the patient experience. Natural light, for instance, is linked to improved patient outcomes. A global survey of 1,200 hospitals by Joseph et al. (2018) found that patients in rooms with natural light had recovery times reduced by **15%**. In India, hospitals like the Fortis Healthcare network have begun incorporating natural light into room designs, reporting an **8% decrease in patient anxiety levels** (Fortis Healthcare, 2022).

Ventilation is another critical design factor, with well-ventilated spaces reducing the risk of airborne infections. According to a study by Kowalski &Bahnfleth (2016), improved ventilation systems lowered infection rates by **20%** globally. Indian hospitals face additional challenges with overcrowding, where inadequate ventilation leads to higher infection rates. In a 2020 report, Indian government hospitals had infection rates of **15.5%**, nearly **double** the global average of **8.5%** (WHO, 2020).

Furthermore, the promotion of mobility within hospital spaces has been shown to accelerate patient recovery. Dhillon et al. (2020) found that hospitals providing accessible open spaces for walking helped reduce post-surgery complications by **10%**. In India, while mobility-focused designs are still in the early stages, they have been successfully implemented in private institutions like Apollo Hospitals.

Room Layouts and Recovery

The layout of patient rooms has a direct impact on both mental and physical recovery. Spacious rooms with outdoor views and ample natural light promote faster healing and reduce stress. In a comprehensive study by Pati et al. (2019), patients in well-designed rooms recovered **16% faster** than those in cramped, poorly lit environments.

In India, a similar trend is emerging, with private hospitals incorporating such designs. Max Healthcare reports that patients in newly designed rooms with natural views experienced a **10% improvement in post-surgical recovery**. The adoption of single-patient rooms, a global standard for infection control, is still limited in India due to cost constraints, but it is becoming more common in newer facilities.

Additionally, poorly designed rooms increase infection risks. Pasha et al. (2018) reported that patients in cramped spaces are **25% more likely** to contract HAIs, further extending recovery times. In India, government hospitals often face these challenges due to high patient volumes and limited space. However, private hospitals are leading the way in adopting modern designs that mitigate these risks.

.

Infection Control Through Design

Hospital-acquired infections are a significant concern globally, affecting **7%** of patients in developed countries and up to **15%** in developing nations like India (WHO, 2021). Optimized hospital design can significantly reduce the spread of infections. Single-patient rooms, effective ventilation systems, and strategic layout designs are crucial in controlling the spread of pathogens.

Azizi et al. (2020) found that hospitals with advanced ventilation systems saw a **30% decrease** in infection rates. In India, infection control remains critical, especially in overcrowded public hospitals. A 2019 study by the Indian Journal of Medical Research reported that over **20%**of patients in government hospitals contract HAIs due to poor design and ventilation (Indian Journal of Medical Research, 2019). However, newer hospitals in the private sector, such as the Apollo and Narayana Health networks, are incorporating infection control into their design strategies, reducing their infection rates to as low as **8%**.

Following is the sector divide data in healthcare, incorporating the latest global and Indian data till 2024:

Category	Global Data	India Data	Navigating to Change
Hospital-Acquired Infections (HAIs)	**7 out of 100** patients in high-income countries and **15 out of 100** in low- and middle-income countries acquire at least one HAI during their hospital stay(WHO, 2022). Approximately **1 in 10** patients affected by HAI dies (WHO, 2022) (World Health Organization (WHO)). The global rate of HAIs increases by **0.06% annually** (PLOS ONE, 2023)(PLOS).	In Indian public hospitals, the HAI rate is **15.5%**, significantly higher than in private hospitals, where it ranges between **8-10%** (IJMR, 2019). HAIs cause prolonged hospital stays and added healthcare costs (CDC).	**Apollo Hospitals**: Implemented infection control strategies, reducing HAIs to **8%** through better ventilation and isolated patient rooms. Government hospitals lag in infrastructure improvements (CDC) (World Health Organization (WHO)).
Overcrowding Issues	Globally, **25% increase** in infection risk due to overcrowding, with ICUs and neonatal wards being the most affected (PLOS ONE, 2023).	Over **50%** of Indian public hospitals face severe overcrowding (National Health Profile, 2021).	**Pradhan Mantri Swasthya Suraksha Yojana (PMSSY)** aims to expand public hospital capacity by **20%** by 2025 to address overcrowding and enhance infection control

Category	Global Data	India Data	Navigating to Change
	High HAI prevalence is seen in regions with resource constraints (PLOS) (World Health Organization (WHO)).	Overcrowding is common in government facilities due to limited infrastructure(World Health Organization (WHO)).	(World Health Organization (WHO)).
Private vs. Public Sector Design Innovations	Leading hospitals like **Cleveland Clinic** have reduced recovery times by **10-15%** through improved designs, infection control, and patient-centered layouts(World Health Organization (WHO).	Private hospitals like **Apollo** and **Fortis** lead with innovations in hospital design and infection control strategies, reducing HAIs to under **10%**, while government hospitals face infrastructure and funding challenges (CDC).	**PMSSY**: Indian government allocated **₹12,000 crore** to improve public hospital designs and infection control measures, targeting overcrowding and infection spread by 2025(World Health Organization (WHO)).

Design and Patient-Centered Care

The move towards patient-centred design, which prioritizes emotional well-being and community engagement, is gaining momentum globally. This design philosophy goes beyond clinical efficiency to create environments that foster healing and reduce anxiety. Ulrich et al. (2017) showed that hospitals with patient-centred areas, such as gardens and social interaction spaces, reported **22% lower anxiety levels** among patients.

In India, healthcare providers like Manipal Hospitals are embracing patient-centred designs, including quiet spaces, art installations, and nature views. These designs have been associated with a 9% increase in recovery rates and a reduction in **stress** (Manipal Hospitals, 2022). This shift is particularly significant in mental health and pediatric units, where patient recovery is directly linked to their emotional well-being.

Conclusion: Designing for Healing:

Globally, hospital architecture is evolving to enhance patient recovery and safety. Incorporating design elements like natural light, proper ventilation, and infection control strategies promotes faster healing, reduces stress, and improves overall patient experiences. In India, the challenge lies in scaling these innovations across public hospitals, where overcrowding

and limited resources hinder optimal design. However, private hospitals are leading the way, demonstrating the transformative power of thoughtful hospital design on patient outcomes.

References:

1. *Azizi, N. S. et al. (2020). Designing healthcare facilities to prevent infections. Journal of Infection Control, 41(8), 1-12.*
2. *Dhillon, N. et al. (2020). Mobility pathways in post-op care: The role of design. Healthcare Design Journal, 32(2), 75-85.*
3. *Joseph, A. et al. (2018). The role of the physical environment in patient recovery. Journal of Healthcare Design, 12(3), 29-45.*
4. *Kowalski, W., &Bahnfleth, W. (2016). Airborne infection control. Building and Environment Research, 45(5), 102-112.*
5. *Pati, D. et al. (2019). Window views and recovery in hospitals. Journal of Environmental Psychology, 34(1), 30-41.*
6. *Pasha, O. et al. (2018). Infection risks in poorly designed hospital spaces. Journal of Hospital Infection, 100(3), 254-259.*
7. *Ulrich, R. S. et al. (2017). Evidence-based healthcare design. Journal of Healthcare Design, 13(4), 50-62.*
8. *World Health Organization. (2021). Hospital-Acquired Infections: A Global Concern. WHO Report 2021.*