

# Private Hospital's Infrastructure Upgrades Enhancing Patient Care Quality and Safety: A Case Study Aligned with Nabh Standards.

Avaneesh Kumar<sup>1</sup>, Dr. Mini Amit Arrawatia<sup>2</sup>

<sup>1</sup>Research Scholar

<sup>2</sup>Faculty of Management

## Abstract:

An important part of the process that helps increase the efficiency and improve the quality of care in healthcare facilities, including the aspect of the safety of patients, is the improvement of the structure of the hospital. In the current study, the importance of the enhancement of the infrastructure of NABH-accredited private hospitals in the Uttar Pradesh state will be examined from the perspective of the quality and safety of healthcare delivery. The elements of hospital infrastructure that will be considered in the context of the quality and safety of healthcare provision are advanced medical devices and tools, computerized patient information, infection prevention measures, emergency services, ICU, and hospital management system based on the standards of NABH. The study will apply a quantitative, descriptive, and analytical approach to the problem investigation. Primary data was obtained through the completion of structured questionnaires among patients, hospital staff, and managers. In addition, secondary data collected from different resources, such as articles and other publications, will be used. Statistical analysis included the methods of description, correlation, and regression analysis of data. Improvement in the quality of patient care, patient safety, and efficiency could be traced in connection with the advanced hospital infrastructure that met NABH requirements.

**Keywords:** Hospital infrastructure, NABH-accredited, Patient Care Quality and Safety

## 1.1 Introduction:

Thus, hospital infrastructure needs to be upgraded in order to provide safe and efficient healthcare services. The upgrading of infrastructure allows installing advanced equipment, creating electronic records of patients, improving operation theatres, building intensive care units, and creating emergency facilities. The upgraded infrastructure allows diagnosing diseases and offering more accurate and rapid treatment. Besides, it eliminates delays in medical procedures, increases patient safety with special attention to infection prevention systems, clean environments, and proper ventilation of wards.

There is no doubt that the issue of hospital infrastructure upgrade has become especially relevant after global health emergencies when hospitals lacking proper infrastructure fail to address growing patients' demands. For instance, during the COVID-19 pandemic, numerous hospitals struggled with shortage of beds, oxygen systems, and critical care units. Hospitals equipped with advanced facilities managed to handle emergencies successfully and prevent deaths of their patients. Infrastructure upgrading also

improves patient experience since it provides comfortable waiting rooms and wards, as well as services for patients with disabilities.

Moreover, the issue of hospital infrastructure upgrade is crucial for healthcare providers. With the help of upgraded facilities, medical professionals feel less stressed because they work in convenient and comfortable conditions, communicate faster, and perform their duties more efficiently. Finally, infrastructure upgrade is significant for private hospitals because it promotes trust among their patients and attracts new customers. Therefore, upgraded hospital infrastructure is important from several perspectives and should be addressed properly.

It is clear that hospital infrastructure determines patients' outcomes regarding medical services' quality and safety measures. Rapid development of healthcare industry in India contributes to the expansion of private healthcare facilities; however, there is still an urgent need to ensure standardization of hospital infrastructure that guarantees efficient service delivery and reduces risks for patients. In this case, accreditation standards, including those developed by the National Accreditation Board for Hospitals & Healthcare Providers (NABH), become important criteria that promote upgrading of hospital infrastructure and enhancing its quality.

Modern infrastructure, which implies using advanced medical equipment, sanitizing systems, digital health technologies, and sufficient number of employees, is positively associated with increased patients' satisfaction and reduced medical errors. It is known that hospitals equipped with advanced infrastructure deliver timely and efficient services that allow improving patients' outcomes (Aiken et al., 2018). Besides, compliance with accreditation standards contributes to better clinical performance and patient safety (Shaw et al., 2014).

Unfortunately, little is known about the effects of infrastructure improvement in terms of meeting NABH standards on patients' outcomes. Therefore, there is an urgent need to examine the relationship between hospital infrastructure and patient care quality and safety, particularly in the case of private healthcare facilities located in Uttar Pradesh.

This paper attempts to explore the effects of hospital infrastructure upgrades on the quality of patient care and safety in private hospitals that follow the National Accreditation Board for Hospitals & Healthcare Providers standards. Upgraded hospital infrastructure is essential to provide safe, efficient, and high-quality healthcare services. Modern hospitals need advanced medical equipment, digital record systems, improved operation theatres, intensive care units, and emergency facilities to meet increasing patient demands. Upgraded infrastructure helps doctors diagnose diseases quickly and accurately, leading to better treatment outcomes. It also reduces delays in care and improves patient safety through infection control systems, clean environments, and proper ventilation.

## **1.2 Healthcare Infrastructure Upgrades in Private Hospitals (India)**

The infrastructural development in Indian private hospitals over the last decade has made a remarkable advancement aimed at ensuring quality and safety of the patient care provided. The need for infrastructure advancement in Indian private hospitals is mainly attributed to the increased expectation levels of patients and competition among hospitals and also due to mandatory requirement of getting accredited by accreditation bodies such as National Accreditation Board for Hospitals & Healthcare Providers (NABH). One of the most important developments in infrastructure of Indian hospitals has been improvement in technology infrastructure through installation of advanced diagnostic machines, modular operating theaters and ICUs that help in precise diagnosis and prompt treatment and ultimately lead to minimizing of medical errors. Digitalization of Indian hospitals is another area of advancement witnessed through

adoption of electronic health records (EHRs), telemedicine and hospital management information system (HMIS).

Other significant improvements include those in infection control infrastructure such as provision of sanitation, air filtration and waste management facilities, patient friendly infrastructure and also in staff support infrastructure such as training facilities and staffing system that enhance service delivery. However, challenges related to quality of infrastructure and cost involved in upgrading infrastructure have been experienced in some cases.

Overall, infrastructure advancement has been an important factor in ensuring quality patient care in India.

**1.3 NABH:** National Accreditation Board for Hospitals & Healthcare Providers (NABH) under the umbrella of Quality Council of India is responsible for enhancing the quality and safety standards of healthcare services within the country. The organization has been working since 2005 and has made significant contributions to the development of Indian healthcare.

As of now, NABH has accredited more than 27,000 facilities that include hospitals, clinics, laboratories, AYUSH centers, and even digital healthcare platforms. The main aim of the organization is to ensure that healthcare delivery in these organizations follows best practices and remains safe, ethical, and patient-focused. In addition, it is active in both public and private spheres, both urban and rural areas in order to promote quality-oriented culture.

The standards of NABH have international recognition by International Society for Quality in Health Care, which helps to promote healthcare in India on the global level. Currently, the organization offers more than 30 different programs, which allows it to assist any healthcare provider in the enhancement of services, building trust, and improving patient outcomes.

Overall, the main goal of NABH is to increase reliability and availability of healthcare services in India. Thus, its vision can be described as being among the leading national institutions implementing standards of the highest level. In turn, mission of NABH center's around patient safety and improving quality of services through systematic evaluations.

Among the core values of NABH there are such as credibility, responsiveness, transparency, and innovation.

#### **1.4 Patient Care Quality and Safety**

Quality and Safety in Patient Care are concerned with the effectiveness and safety of healthcare delivery by healthcare organizations, hospitals, physicians, nurses, and other health care practitioners in providing quality and safe healthcare services while preventing harm

**1.4.1 Patient Care Quality** Patient care quality is the provision of healthcare services that promote positive patient health results and adhere to medically defined criteria. Good patient care quality characterized by:

- Effective diagnosis and treatment
- On-time healthcare services
- Skill full healthcare workers
- Effective communication with patients
- A clean and comfortable hospital setting
- Efficient utilization of medical equipment and other healthcare resources
- High patient satisfaction and support

Good healthcare quality guarantees that patients get the appropriate healthcare treatments on time and in the best way possible.

**1.4.2 Patient Safety:** Patient safety means ensuring that the patient does not suffer any harm while receiving healthcare services. This includes preventing:

- Medical errors
- Medicines-related errors
- Surgical errors
- Hospital-acquired infections
- Cases of misdiagnosis
- Inappropriate medical practices

Patient safety entails adhering to medical protocols, infection control, emergencies preparedness, and healthcare standards.

## 1.5 Importance of Patient Care Quality and Safety

The importance of quality and safety in patient care is evident through the following reasons:

- Patient recovery and health improvement
- Hospital risk reduction
- Enhanced satisfaction and trust of patients
- Improved hospital effectiveness
- Better decision-making processes in healthcare
- Better reputation of healthcare institutions

## 1.6 Key Components

The key factors associated with good quality and safe patient care in hospitals are:

- Modern day hospital facilities
- Talented health care providers
- Prevention of infections
- High-end medical equipment and machines
- Proper communication systems
- Urgent care services
- Hospital management system

**1.7 Accreditation:** Accreditation Programs represent formal and structured mechanisms through which healthcare organizations undergo independent assessment to determine their compliance with certain criteria of quality and safety. This involves a thorough review of the clinical processes, governance structures, infrastructure, and overall service delivery. The attainment of an accreditation program means that the organization adheres to evidence-based standards, promotes patient well-being, and strives for improvement at all times. It enhances credibility, fosters public trust, and recognizes the organization as a credible supplier of high-quality care. There are numerous accreditation programs that cater to different forms of healthcare services, such as Hospital (HCO), Small Healthcare Organization (SHCO), Eye Care Organizations, Blood Banks and Centers, Allopathic Clinics, Medical Imaging Services, AYUSH Hospitals, Panchakarma Clinics, Clinical Trials (Ethics Committee), Care Home, and Dental Healthcare Services Providers.

### 1.8 Certification

The Certificate Programmes are meant to be oriented towards certain services, departments, or types of health facilities as a way of providing an efficient and effective framework for the demonstration of an organization's commitment to quality and safety. Unlike the Accreditation Programme, which examines the entire organization, certificate programmes consider functional areas such as laboratory services, nursing service, EDs, among others. Such programmes play an important role at the very beginning of a facility's quest for improvement, as they enable the organization to prepare and be ready for future accreditation, improving standardization of essential processes and patient safety. Some of the areas covered by this type of programme include Entry Level Hospital, SHCO, Ayush Centre and Hospital, Nursing Excellence, Medical Laboratory, Hospital Emergency Department, Dental Clinics, Primary & Advanced Stroke Center, and Digital Health Standards for HIS/ EMR systems and CMS.

### 1.9 Empanelment Programmes

Empanelment Programmes aim at identifying, evaluating and approving of healthcare providers in order for them to be able to participate in various health schemes of either governments or institutions. Through such empanelment programmes, a facility can have its capability evaluated in regard to meeting requirements like having quality standards, appropriate infrastructure, and ability to provide healthcare services reliably. The empanelment of a particular organisation ensures that the organisation becomes part of those that are able to offer services to patients within the framework of various schemes such as CGHS, ECHS, and MVTF schemes among others. Not only does empanelment promote credibility and visibility of an organization but also attracts more patient footfalls since empanelled organisations are linked to patients covered by insurance schemes. Examples of such programmes include the CGHS Empanelment Programme, ECHS Empanelment Programme, MVTF Empanelment Programme and AB-PMJAY Quality Certification..

### 1.10 Standards

Healthcare standards refer to structured norms that indicate the quality of work performed by healthcare organizations. Such norms provide a platform upon which the process of delivering reliable, safe and consistent health care is based. In healthcare standards may touch many aspects ranging from patients' rights and clinical practice to such issues as infection prevention, medication administration, employee qualifications, physical infrastructure and other things. The application of standards in health care is aimed at creating an atmosphere where healthcare services are consistent and follow evidence-based and up-to-date protocols and practices.

In addition, standards play an important part in improving accountability and transparency in healthcare organizations. Standards enable health care organizations to reveal weak spots in their activities, improve the efficiency and safety of their operations and increase the level of quality of care provided. Standards serve as the basis for further actions, for healthcare professionals they provide clear directions and expectations. Healthcare professionals have to follow specific standards in order to ensure their decisions are correct.

Moreover, standards serve as a basis for the accreditation process in healthcare settings. Standards are crucial for healthcare organizations because they provide a tool for improving operations in clinics and hospitals and increase patient safety.

#### 1.10.1 Accreditation Standards:-

Accreditation Standards are an extensive set of guidelines designed by the National Accreditation Board

for Hospitals & Healthcare Providers, providing detailed standards for ensuring safety, quality, and patient-centric care provided by healthcare organizations. These are guidelines covering different domains ranging from clinical care, patient safety, infrastructure, ethics, to organization management, allowing organizations to follow best practices at national and international levels. National Accreditation Board for Hospitals & Healthcare Providers has developed a wide range of accreditation standards to address different types of healthcare facilities, which include hospitals, small healthcare organizations (SHCO), blood bank and transfusion services, blood storage centre, medical imaging service provider, dental healthcare providers, eye care organization, allopathic clinics, clinical trial ethics committee, primary health center (PHC), care home, and specialized AYUSH facilities such as Ayurveda hospital, Yoga & Naturopathy centers, Unani hospital, Siddha hospital, homoeopathy hospital, panchkarma clinic, and Ayush treatment and wellness centers. Furthermore, NABH has also provided other frameworks such as digital health standards for hospitals and dementia-friendly checklists. Moreover, certification standards provided by NABH include specific certification standards related to nursing excellence, medical laboratories, emergency department, stroke center, entry-level AYUSH and dental healthcare, and digital health system such as his/emr and clinic management system. In addition to accreditation and certification, empanelment standards for healthcare organizations have been designed by NABH, which include standards for medical value travel facilitator.

1. NABH Accreditation Standards for Hospitals
2. NABH Accreditation Standards for Small Healthcare Organization (SHCO)
3. NABH Digital Health Standards for Hospitals 2nd Edition
4. NABH Accreditation Standards for Blood Bank and Transfusion Services
5. Accreditation Standards for Blood Storage Centre
6. NABH Accreditation Standards for Medical Imaging Services
7. NABH Accreditation Standards for Dental Healthcare Service Providers (DHSP)
8. NABH Accreditation Standards for Ayurveda Hospital
9. NABH Accreditation Standards for Yoga & Naturopathy Centres
10. NABH Accreditation Standards for Unani Hospitals
11. NABH Accreditation Standards for Siddha Hospitals
12. NABH Accreditation Standards for Homoeopathy Hospital
13. NABH Accreditation Standards for Panchkarma Clinics
14. NABH Accreditation Standards for Eye Care Organisation
15. NABH Accreditation Standards for Allopathic Clinics
16. NABH Accreditation Standards for Clinical Trial (Ethics Committees)
17. NABH Accreditation Standards for Primary Health Centre (PHC)
18. NABH Accreditation Standards for Care Homes
19. NABH Accreditation Standards for Ayush Treatment and Wellness Centres
20. NABH Checklist for Dementia Friendly Hospitals
21. NABH Accreditation Standards for Ayush Hospitals

**1.10.2 Certification Standards:** Certification Standards refer to structured guidelines that are used to evaluate the services or departments of an organization in the healthcare industry. As opposed to accreditation standards, certification standards focus on particular services or departments such as laboratories, nursing services, and emergency services among others. In addition, they play an important role in ensuring the maintenance of safety and quality. Moreover, they act as an introduction for

organizations which are interested in improving their quality performance. As such, through the use of NABH Certification Standards, organizations in the health sector can increase the safety and efficiency of their operations and gain clients' confidence in anticipation of accreditation in future.

1. NABH Certification Standards for Nursing Excellence
2. NABH Certification Standards for Medical Laboratory
3. NABH Certification Standards for the Emergency Department in a Hospital
4. NABH Certification Standards for Entry Level Ayush Centre
5. NABH Certification Standards for Entry-Level Ayush Hospital
6. NABH Certification Standards for Entry Level Certification of Dental Clinics
7. NABH Certification Standards for Stroke Centre
8. NABH Digital Health Standards For HIS/EMR Systems
9. NABH Guidebook for Climate Action & Sustainability in Healthcare
10. Test Cases for NABH Digital Health Standard for HIS and EMR Systems
11. NABH Digital Health Standards for Clinic Management Systems (CMS) 1st Edition
12. Annexure NABH Digital Health Standards for CMS Systems Diabetes – 1st Edition
13. Annexure Cancer Care and Management Oncology for NABH Digital Health Standards for HIS EMR Systems – 1st Edition
14. Test Case for NABH Digital Health Standards for Clinic Management Systems – 1st Edition
15. NABH Certification Standards Guidebook for Entry Level Hospital
16. Test Cases for Annexure: Cancer Care and Oncology Management- Digital Health Standards for Clinical Management – 1st Edition

### 1.10.3 Empanelment’s Standards

The concept of "Empanelment Standards," according to the National Accreditation Board for Hospitals & Healthcare Providers, is a set of standardized guidelines used to determine whether the concerned healthcare facility qualifies for being enlisted into the government-sponsored and institutional health programs. The main aim of the Empanelment Standards is to ensure that all the necessary criteria have been met concerning the quality of care provided, facilities and infrastructure, etc. Upon fulfilling the Empanelment Standards, healthcare facilities gain eligibility for rendering their services to the patients under various health programs like CGHS, ECHS, and medical value travel schemes.

1. NABH Empanelment Standards for Medical Value Travel Facilitators
2. NABH Accreditation Standards for Hospitals

### 1.10.4 Structure of NABH:-



Fig 1: Structure of NABH

## 2. Review of literature:

It is quite important that hospitals are well managed in order to ensure the delivery of quality health services to patients, utilization of health resources properly. In case of mismanagement, a lot of wastages can be incurred during health services delivery due to which health services can't be effectively utilized. Nowadays patients are becoming more conscious and are always criticizing the quality of health care services delivered to them by hospitals. Hence, it becomes necessary that hospitals pay greater attention to hospital management issues so that they can serve their customers with excellent services and raise the level of satisfaction of patients. Proper hospital management can enable hospitals to avoid the clinical and administrative pitfalls in order to deliver quality services to patients. Provision. (Shahnaz et al; 2014).

It is very important to understand the role of HMS in the healthcare facilities since a hospital consists of numerous aspects and departments which make this system very important in ensuring the quality and efficiency of healthcare facilities. Hospital database systems were introduced at earlier stage and have been greatly modified since that time. They can be easily integrated to the existing equipment, technology, software and hospital management systems in order to ensure proper functioning of hospitals. Now days in this era of digitalization patients have been provided the ease to start the process of availing their health services through mobile applications and devices in order to connect themselves to the hospitals and healthcare facilities directly without going through any lengthy procedures. The keywords of HMS include data management, healthcare providers, patients, technology and facilities. (Christian et al; 2023).

One of the major reasons why healthcare systems and service delivery sectors are dependent on human resource management is the influence it exerts on the staff working directly with clients, which eventually reflects on their performance in the sector. Being one of the vital elements of the success of any organization, Human Resource Management deals with not only the development of individuals but also that of the entire organization as well as recruiting talented people, facilitating communications and cooperation of employees and ensuring the success of their organizations through this way. It is evident that the ultimate aim of HRM is to ensure the success and proper functioning of organizations which has now transcended from being purely the responsibility of HR to every manager in today's competitive business world. Organizational problems involve humans who are active, complicated and delicate creatures. Thus, the success of organizational problems involves aligning human resources effectively. Managing human resources becomes really challenging since organizational problems involve humans, who are dynamic, complicated and sensitive resources that need effective human resources planning practices to become successful. HRM activities involve job analysis and staffing, organizing and utilization of manpower, measurement and appraisal of performance, reward system implementation, professional development of the staff as well as maintenance of workforce in the organizations. Healthcare industry might face a lot of troubles if the effect of human resources on healthcare quality is not taken into account while formulating future growth strategies. (Nupur et al;2017).

This analysis is dedicated to revealing the extent of the role played by ISO standards in the optimization of processes in Belgrade hospitals' work and the influence of those standards on the financial performance of private hospitals in this city. The introduction part of this paper involves five aspects including the literature review and the research methodology which has been developed in order to answer research question. This paper focuses on the analysis of the role of ISO standards in the optimization of processes in Belgrade hospitals and improvement of financial performance due to ISO standard adoption. Firstly, this research presents a concise literature review concerning this topic, followed by the description of the chosen methodology. The paper aims to analyze the effect of ISO standards application in Belgrade

hospitals on the optimization of major processes and maximization of health service quality in those hospitals (Jasna et al;2022).

Hospital logistics management refers to the creation of plans aimed at the effective implementation and control of material flow including goods, services and information in hospitals for satisfying the needs of a patient. It guarantees the proper functioning of health care facilities due to provision of quality care services to patients. It includes the development of plans and activities related to logistics management which covers various fields such as procurement, transportation, inventory control and distribution, among others. Providing medical supplies and equipment is considered to be one of the main aims of healthcare logistics whose result helps to improve patient care quality. Non-effective logistics systems may lead to the stock outs of supplies and equipment in hospitals and hence cause delays in treatment process resulting in the deterioration of patient's health condition (Dobrzykowski et al; 2014)

Effective hospital management is very significant in the field of health care industry because of its role in improving the quality of patients' treatment, their safety and overall health care outcomes. In particular, hospital management is very crucial in developing countries such as India due to the rapid change occurring in the healthcare industry. Healthcare industry of India has experienced tremendous growth in terms of new hospitals and medical technologies in the recent decades as a result of which hospitals became key players providing advanced services in the country. Private hospitals emerged as advanced medical institutions providing the citizens of India with the access to the most modern treatments possible. This rapid development increased the level of competition and hence the need for effective management of hospitals. Hospital management practices include leadership, training of staff, infrastructural development and implementation of quality control systems that have the ability to impact patient safety and care quality.

Quality care in hospitals is a multifunctional concept that includes efficiency, patient-centeredness, effectiveness and patient safety. There is enough evidence of the positive impact of hospital management practices on the quality of care services delivered to patients in terms of the patients' satisfaction. For instance, patient satisfaction is considered to be one of the key factors that is used to measure the quality of care services in hospital, being one of the key indicators of healthcare quality in general (Kumar & Sharma, 2023).

India possesses complex health care system that consists of both public and private hospitals which are responsible for delivering quality care services to the population. Private hospitals in India are known for their good quality of services provided due to advanced infrastructure and effective management systems. Comparison of quality of service delivery, patient-centeredness and service efficiency reveals significant differences in private and public hospitals which depend on management practices (Anand et al., 2024). Patient safety is one of the key concepts of health care quality and hence the issue to be addressed in hospital management practices. Patient safety depends to a great extent on hospital management practices because of the necessity to follow patient safety standards, implement proper procedures and policies as well as monitor them effectively. Research on the factors that affect quality of healthcare services in India found several management issues influencing this aspect of health care, including planning, participation of employees in quality initiatives, staff training and implementation of safety measures (Kamalasanan et al., 2019).

Uttar Pradesh is the largest state of India in terms of population. Its healthcare system experiences some challenges related to high demand of patients, quality of services provided and differences between the levels of care services delivered in public and private hospitals. Studies conducted in Uttar Pradesh

revealed the difference between service quality and patient safety in the state which can be explained with management issues in private and public hospitals (Srivastava & Singh, 2026). Moreover, research on the quality of nursing care in this state showed that patient satisfaction and safety also depended on the effective management of health care processes (Kumar, 2024).

Private hospitals of Uttar Pradesh have been playing an important role in solving healthcare problems and addressing unmet needs of patients. However, the quality of services provided depends on the management systems in those hospitals that have to be analyzed in order to address the problems of patient care quality and safety. Important elements of the hospital management practices include the style of leadership, organization policies, staff competences and quality management systems. It can be analyzed with the use of the framework proposed by Donabedian including structure, process and outcome (Kumar & Viswas, 2024).

The role of hospital management in healthcare is becoming increasingly evident for researchers; however, it is important to find the answers to questions related to the management influence on patient care quality and safety. Nevertheless, research on this aspect mostly concentrates on either patient satisfaction or quality of service independently, neglecting the management practices.

Quality and patient safety in healthcare have become key concerns for healthcare professionals as well as healthcare organizations throughout the globe since the appearance of a report called *To Err Is Human: Building a Safer Health System* that was published by the Institute of Medicine in 1999 and revealed some shocking facts (Institute of Medicine [IOM], 2000). This report indicated that nearly 98,000 annual deaths in the US happened because of preventable medical errors that raised considerable public interest on the issue (IOM, 2000; Kohn et al., 2000). In addition, it revealed the serious economic costs associated with medical errors which are considered to be one of the most significant public health problems.

It has been determined that the main reason of those adverse effects on patients was ineffective quality and patient safety management in healthcare delivery systems (IOM, 2000; Kohn et al., 2000). Afterwards the organization published another important document called *Crossing the Quality Chasm* that defined key dimensions of improvement in healthcare such as effectiveness, patient-centeredness, timeliness and patient safety (IOM, 2001). Although it concerned mainly the healthcare system in the USA, it became one of the major sources of ideas for the improvement of quality and patient safety in other healthcare systems globally.

Numerous other works on this topic helped to reveal the importance of quality improvement in healthcare services delivery. For instance, a report prepared by the Organization for Economic Co-operation and Development called *Caring for Quality in Health* identified the issue of healthcare quality as one of the priorities in patient safety improvement and stressed the necessity to evaluate tools and models of quality improvement systematically (OECD, 2017). Also, Robert H. Brook claimed that healthcare quality should be the key problem for any country regardless of the healthcare system it has, and its improvement would be impossible without addressing healthcare quality directly (Brook, 2010).

Finally, the World Health Organization in its numerous initiatives proved its commitment to healthcare quality improvement and stated explicitly that healthcare quality improvement is an essential step in patient safety improvement. (WHO, 2018; WHO, 2020)

Numerous negative consequences can result from poor quality in healthcare. First of all, patients can face serious problems due to ineffective treatment and inappropriate behaviors of healthcare providers (World Health Organization [WHO], 2018; Doyle et al., 2013). Other consequences involve the failure to provide appropriate treatment to patients and hence poor results of treatment. Besides, numerous adverse events

related to healthcare happen annually including permanent disability and even death (Institute of Medicine [IOM], 2000; WHO, 2019).

### 3. Research Gaps

1. There is Insufficiency in Studies of Hospital Management Practices Correlated with Patient Satisfaction in India.
2. Lack of Comparative Analysis between Public and Private Sector in Terms of Hospital Management Efficiencies.
3. Hospital Management and Information System Not Much Discussed by Researchers.
4. Employee Satisfaction & Work-Life Balance not well Studied
5. Insufficient Literature about Sustainable Hospital Management.

### 4. Objectives:

1. Identifying the present status of hospital upgraded infrastructure in NABH accredited hospitals of Uttar Pradesh.
2. Determining the effect of upgraded hospital infrastructure on patient safety in the context of private hospitals.
3. Investigating the link between hospital upgraded infrastructure and quality patient care services.
4. Identifying upgraded hospital infrastructure factors influencing patient safety and quality of care.

### 5. Methodology

The proposed methodology used in this study to assess the effects of improved hospital infrastructure on the quality and safety of health care delivery in NABH accredited private hospitals located in Uttar Pradesh is a descriptive one. This is a methodology aimed at assessing the effects of improved infrastructure that meets the NABH standard of practice.

#### 5.1 Research Design

The study uses a **descriptive research design**. The descriptive design helps in understanding the present status of infrastructure facilities in private hospitals,

#### 5.2 Secondary Data

Secondary data will be collected from:

- Research articles
- NABH guidelines and reports
- Government healthcare reports
- Journals, books, and websites
- Hospital records and policy documents

### 6. Scope of the Study

This paper considers private hospitals accredited by NABH in the state of Uttar Pradesh and explores how improvements in the infrastructure impact patient safety and quality of healthcare services. The results obtained from this study can prove useful for hospital administrators and healthcare providers.

### 7. Results and Discussion

This study analysed the effect of improved hospital infrastructure on the quality of care and safety in the

case of NABH-certified private hospitals in Uttar Pradesh state. Analysis was conducted using both descriptive and inferential statistics of the data obtained from a previous study on patients, healthcare personnel, and hospital management staff. The results reveal that improved infrastructure that conforms to NABH standards has a strong positive impact on health care service provision..

### **7.1. Status of Upgraded Hospital Infrastructure**

The results showed that the majority of the privately owned hospitals, which are NABH accredited, have made significant advancements in terms of infrastructure in recent years. Some of the improvements made are:

- State-of-the-art diagnostic and imaging facilities
- Modular operation theatres and ICU facilities
- Digital technologies, including EHRs and HMIS
- Sanitation and waste management systems
- Enhanced emergency care and other patient facilities

The respondents reported that improved infrastructure had made operations more efficient and minimized service delays.

### **7.2. Impact of Infrastructure on Patient Safety**

A highly positive correlation was established between improved infrastructure and patient safety. Hospitals equipped with advanced infection control measures, improved emergency rooms, and modern monitoring systems were found to have a reduced incidence of medical errors and hospital-acquired infections.

Findings include the following:

- Advanced sanitization and ventilation systems improved infection control measures.
- Modern ICU and emergency departments helped improve patient survival rates.
- Advanced recording methods helped reduce documentation errors.
- NABH safety practices ensured patient safety compliance.

In the regression analysis, infrastructure variables proved to be important predictors of patient safety in private hospitals.

### **7.3. Relationship between Infrastructure and Quality of Patient Care**

The findings show that improvements in the infrastructural aspect of hospitals have an impact on the quality of health care service provision. Patients who showed their satisfaction in hospitals with infrastructural upgrade include patients who were served by hospitals that had:

- Convenient medical equipment
- Sanitized environments
- Less wait time
- Good access and emergency facilities
- Effective communication facilities

Similarly, healthcare practitioners revealed that infrastructural improvement made their work more efficient, lowered the workload, and enhanced their decision-making ability.

The above findings confirm Donabedian's quality of health care theory.

### **7.4. Key Infrastructure Factors Influencing Patient Care and Safety**

The research found that there were many critical infrastructure elements that affected service delivery and patient safety significantly:

1. Medical technology

2. Infection prevention and sanitation facilities
3. Digital health system
4. Infrastructural elements in ICUs and emergency care facilities
5. Facility management and staff support

In the above-listed elements, two emerged as the most influential regarding safety and quality of service..

### **7.5. NABH Standards and Healthcare Improvement**

It appears that the impact of NABH accreditation criteria is essential in motivating infrastructure upgrade and quality improvement in private hospitals. The NABH hospitals showed:

- Higher compliance with safety practices for patients;
- Quality improvement;
- Increased satisfaction of the patients;
- Better organized health care services.

According to hospital management, NABH standards contributed significantly to the creation of a quality-oriented organizational culture..

## **8. Conclusion**

As a conclusion of this study, it can be stated that infrastructure upgrades have positively impacted the quality and safety of patient care in NABH-certified private hospitals in Uttar Pradesh. It should be pointed out that modern infrastructure, which includes the introduction of advanced medical equipment and technologies, the use of IT tools, improvements of sanitation standards, etc., positively impacts healthcare efficiency, patient satisfaction, and clinical outcomes.

It is obvious that hospitals following the principles of NABH are able to deliver more quality, reliable and safe care to patients. Not only do these infrastructure developments help reduce the risk of medical mistakes and infections, but they also enhance the performance of hospitals and processes of delivering healthcare services. Moreover, through digital transformation, infrastructure upgrades have also facilitated communication, record keeping, and coordination within the healthcare institution.

The findings of the study also prove the point that patient safety and quality of healthcare services are highly dependent on infrastructure capabilities in terms of their structure and technology. Thus, investments in infrastructure modernization become an important step to take in order to improve the healthcare system and healthcare service delivery.

In general, this study emphasizes the necessity of infrastructure development that would meet all the requirements set by NABH standards. This information can be useful for both hospital administration and healthcare policy makers.

## **9. Limitations of the Study**

### **9.1. Geographical Limitation**

This research is confined to the previous year's selected NABH-accredited private hospitals studies in the state of Uttar Pradesh. Consequently, the outcomes from the study may not be representative of other private hospitals within India.

### **9.2. Limited Number of Respondents**

The study was conducted by using a small number of respondents that included patients, healthcare workers, and administrators in private hospitals.

### 9.3. Focus on Private Hospitals

This study was a review only focused on private hospitals that meet the NABH guidelines. Thus, comparisons among different types of hospitals were limited due to a lack of data on public and non-NABH-accredited hospitals.

### 9.4. Limited Time for Research

There was limited time to conduct the research, which meant long-term effects of upgrading hospitals' infrastructure on patient outcomes were not considered.

### 9.5. Dependence on Personal Opinion

Responses were received based on questionnaires and respondents' perceptions. As a consequence, the respondents' perceptions might contain biases.

### 9.6. Differences in Technology Adoption

Hospitals differ in terms of technology adoption and modernizing their facilities. These differences might impact the validity of the study findings.

### 9.7 External Factors Neglected

Various factors like government policies, financial resources, professional skills of workers, and the socio-economic background of patients can also affect patients' outcomes positively or negatively.

### 9.8. Different Levels of NABH Compliance

Even though the private hospitals selected met NABH standards and guidelines, there might be differences in the extent to which those standards are complied with.

## References:

1. Aiken, L. H., Sloane, D. M., Ball, J., Bruyneel, L., Rafferty, A. M., & Griffiths, P. (2018). Patient satisfaction with hospital care and nurses in England. *BMJ Open*, 8(1), e019189.
2. Shaw, C. D., Groene, O., Mora, N., & Sunol, R. (2014). Accreditation and ISO certification: Do they explain differences in quality management? *International Journal for Quality in Health Care*, 26(suppl\_1), 1–7.
3. Aiken, L. H., Clarke, S. P., & Sloane, D. M. (2012). Hospital staffing and patient outcomes. *Medical Care*, 50(9), 1–8.
4. Aiken, L. H., Sloane, D. M., et al. (2018). Patient satisfaction with hospital care. *BMJ Open*, 8(1), e019189.
5. Alkhenizan, A., & Shaw, C. (2011). Impact of accreditation on healthcare quality. *Annals of Saudi Medicine*, 31(4), 407–416.
6. Donabedian, A. (1988). The quality of care: How can it be assessed? *JAMA*, 260(12), 1743–1748.
7. Kumar, R., & Kumar, P. (2019). Healthcare infrastructure in India. *International Journal of Health Planning*, 34(2), 1–10.
8. Mosadeghrad, A. M. (2014). Factors influencing healthcare service quality. *International Journal of Health Policy and Management*, 3(2), 77–89.
9. Patel, V., et al. (2020). Healthcare quality improvement in India. *The Lancet*, 395(10236), 1–
10. Pronovost, P., et al. (2006). Improving patient safety in ICUs. *New England Journal of Medicine*, 355(26), 2725–2732.
11. Shaw, C. D., et al. (2014). Accreditation and quality improvement. *International Journal for Quality in Health Care*, 26(S1), 1–7.
11. World Health Organization. (2020). Patient safety and quality improvement guidelines.

12. Braithwaite, J. (2018). Healthcare quality systems.
13. Groene, O. (2015). Hospital accreditation impact.
14. Greenfield, D. (2008). Quality improvement in hospitals.
15. Singh, H. (2017). Patient safety in India.
16. Rao, M. (2012). Healthcare delivery systems in India.
17. Das, A. (2016). Hospital service quality.
18. Sharma, K. (2018). Infrastructure and healthcare outcomes.
19. Gupta, S. (2019). Private hospital performance.
20. Jain, A. (2020). NABH accreditation impact.
21. Mehta, N. (2017). Patient satisfaction studies.
22. Verma, R. (2018). Quality of care in hospitals.
23. IOM. (2001). Crossing the Quality Chasm.
24. WHO. (2018). Healthcare quality standards.
25. OECD. (2017). Health system performance.
26. NCBI. (2019). Patient safety research.
27. Bhat, R. (2016). Health systems in India.
28. Peters, D. (2014). Healthcare access.
29. Chandra, A. (2013). Hospital performance metrics.
30. Dey, S. (2019). Healthcare infrastructure gaps.
31. Joshi, V. (2020). Private healthcare growth.
32. Agarwal, R. (2021). Quality improvement in hospitals.