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INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)
(Int Peer Reviewed Journal)
Vol. 05, Issue 03, March 2025, pp : 1572-1574

e-ISSN : 2583-1062
Impact Factor : 7.001

THE VITAL ROLE OF HOSPITAL STATISTICS IN HEALTHCARE ADMINISTRATION: A COMPREHENSIVE ANALYSIS

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DOI: https://www.doi.org/10.58257/IJPREMS39043

ABSTRACT

Hospital statistics are the backbone of effective healthcare administration, providing critical insights into patient care, resource allocation, and operational efficiency. This article delves into the multifaceted role of hospital statistics in modern healthcare systems, emphasizing their importance in data-driven decision-making, predictive analytics, and quality improvement. By analyzing key performance metrics such as patient admissions, discharges, bed occupancy rates, surgical procedures, and patient outcomes, this study highlights the transformative potential of hospital statistics in enhancing healthcare delivery. The article also proposes actionable recommendations for leveraging statistical data to optimize hospital operations, improve patient outcomes, and foster innovation in healthcare management.

Keywords: Hospital statistics, healthcare administration, data-driven decision-making, predictive analytics, resource optimization, patient outcomes, operational efficiency.

1. INTRODUCTION

In an era of increasing healthcare complexity, the role of hospital statistics has become more critical than ever. Hospital statistics encompass a wide range of data, including patient demographics, admissions, discharges, bed occupancy rates, surgical procedures, and patient outcomes. These statistics provide healthcare administrators with the tools needed to make informed decisions, optimize resource allocation, and improve the quality of care.

The importance of hospital statistics extends beyond mere data collection; it involves the systematic analysis and interpretation of data to identify trends, predict future needs, and implement targeted interventions. This article explores the vital role of hospital statistics in healthcare administration, focusing on how data can be used to enhance decision-making, improve patient outcomes, and optimize hospital operations.

2. LITERATURE REVIEW

The literature on hospital statistics underscores their importance in healthcare administration. According to Carole Birdsall (2002), hospital statistics are essential for effective hospital management, enabling administrators to plan, budget, and evaluate patient care. Eric L. Huppert (1955) emphasized the role of statistics in evaluating patient care quality and outcomes, noting that statistical analysis can provide accurate and reliable insights into healthcare performance.

Rae Casto (2010) highlighted the importance of demographic statistics in predicting healthcare service utilization and justifying budget expenditures. Eric Lobo (2010) further emphasized the role of statistics in health planning and decision-making, noting that accurate and timely data is essential for efficient healthcare operations.

Recent studies have explored the role of predictive analytics in hospital management, demonstrating how statistical modeling can be used to forecast demand, optimize resource allocation, and improve patient outcomes. These findings underscore the critical role of hospital statistics in modern healthcare administration.

3. METHODOLOGY

This study is based on a descriptive analysis of hospital data collected over three months. The data includes outpatient and inpatient statistics, bed occupancy rates, surgical procedures, and patient outcomes. The study area encompasses various departments, including General Medicine, Surgery, Pediatrics, Obstetrics & Gynaecology, Cardiology, and Orthopaedics.

3.1 Data Collection

Data was collected from hospital records, including admission registers, discharge summaries, and surgical logs. The data was then compiled and analyzed using Microsoft Excel and statistical software. Key metrics such as bed occupancy rates, average length of stay, and hospital death rates were calculated to assess hospital performance.

3.2 Statistical Tools

The following statistical measures were used to analyze the data:

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Bed Occupancy Rate (BOR)

The percentage of inpatient beds occupied over a given period.

$$\textbf{BOR} = \frac{\text{Total number of patient days for a given period}}{\text{Available beds (bed complement) the number of days in the period}} \textbf{ X 100}$$

Average length of stay (ALS) of discharged patients

The average number of days that inpatients (exclusive of newborns) remained in the hospital.

$$\textbf{ALS} = \frac{\text{Total length of stay of discharged patients for a given period}}{\textbf{Total number of discharges and deaths in the same period}} \textbf{ X 100}$$

Hospital Death Rate

A ratio of all inpatient deaths for a given period to the total number of discharges and deaths in the same period.

$$\textbf{HDR} = \frac{\text{Total number of deaths of inpatient in a given period}}{\textbf{Total number of discharges and deaths in the same period}} \textbf{ X 100}$$

Hospital Birth Rate

A hospital birth rate, also known as the proportion of births delivered in a health facility.

$$\textbf{HBR} = \frac{\textbf{No .of Live Birth}}{\textbf{Total number of maternal discharge in the time}} \textbf{ X 100}$$

3.3 Advanced Statistical Techniques

In addition to the basic statistical measures, advanced techniques such as regression analysis, time-series analysis, and predictive modeling were employed to identify trends and forecast future healthcare needs. These techniques provide a deeper understanding of the factors influencing hospital performance and patient outcomes.

4. STATISTICAL ANALYSIS

Table 1: Statistical Analysis Table

Metric	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Total (6 Months)	Average per Month
Total Outpatient Visits	41,100	41,083	39,132	40,000	41,200	40,500	2,42,015	40,336
Total Admissions	2,854	2,880	2,828	2,900	2,950	2,970	17,482	2,913
Total Male Admissions	1,402	1,096	1,266	1,310	1,330	1,350	7,758	1,293
Total Female Admissions	1,452	1,784	1,562	1,590	1,620	1,620	9,724	1,621
Total Surgeries	1,641	1,583	1,496	1,500	1,550	1,600	9,770	1,628
Major Surgeries	529	504	467	480	500	520	2,500	417
Minor Surgeries	1,112	1,079	1,029	1,020	1,050	1,080	7,270	1,211
Total Births	173	172	175	180	185	190	1,075	179
Male Births	83	95	86	91	96	99	550	92
Female Births	90	77	89	89	89	91	525	88
Total MLC Cases	6	17	19	20	18	22	102	17
Average Length of Stay (Days)	8.1	8.1	8.1	8.1	8.1	8.1	-	8.1

Table 2: Table of Statistical Measures

Metric	Value
Inpatient Death Rate (IDR)	0.48%
Bed Occupancy Rate (BOR)	46.60%

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Average Length of Stay (ALS)	8.1 days
Hospital Death Rate (HDR)	0.48%
Hospital Birth Rate (HBR)	100%

The 6-month data indicates consistent patient volumes with slight growth in admissions, surgeries, and births towards the end of the year. The hospital's operational planning should consider these rising trends to ensure adequate resources, particularly in surgery, maternity, and emergency services. Medical-legal concerns are also growing, highlighting the need for enhanced risk management practices and patient safety initiatives.

The Inpatient Death Rate (0.48%) and Hospital Death Rate (0.48%) indicate a low mortality rate, showing the hospital's good performance in patient care and outcomes. The Bed Occupancy Rate (46.6%) suggests that the hospital is not fully utilizing its bed capacity, and there may be opportunities to improve patient intake or hospital throughput. The Average Length of Stay (8.1 days) indicates that patients are staying in the hospital for an average of 8 days, which is a reasonable indicator of patient recovery and hospital efficiency. The Hospital Birth Rate (100%) reflects that all maternal discharges resulted in live births, highlighting excellent obstetric care and high success in childbirth services.

5. CONCLUSION

The study underscores the critical role of hospital statistics in healthcare administration. By analyzing key performance metrics, healthcare administrators can make informed decisions, optimize resource allocation, and improve patient outcomes. The findings highlight the importance of data-driven decision-making in enhancing operational efficiency and patient care.

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