

ASSESSMENT OF UTILIZATION INDICATORS AND THEIR RELATIONSHIP WITH QUALITY INDICATORS MONITORED IN INTENSIVE CARE UNIT

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

by

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Under the Supervision and Guidance of

Dr. Arindam Das

2025

Date: 09th June 2025

Training Certificate

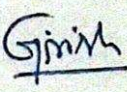
This is to certify that **Ms. Garima Sharma**, has successfully completed 83 days training in **Quality department** from **17th March 2025** to **07th June 2025** at **RJN Apollo Spectra Hospitals, Gwalior**.

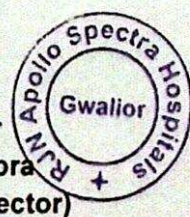
Her training activity includes NABH Processing, familiarization to all the departments and there operations & process under the guidance of **Dr. Amit Kumar Kamlesh, Business Operations Head**.

During the period of her training, we found her punctual, hard working and linguistic.

We wish her every success in her life and career.

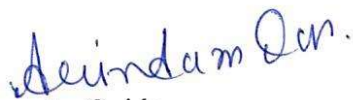
For RJN Apollo Spectra Hospitals, Gwalior


Dr. Girish Arora
(Additional Director)



CERTIFICATE

This is to certify that dissertation titled Assessment of Utilization Indicators and their relationship with Quality Indicators monitored in Intensive Care Unit is a record of the research work undertaken by GARIMA SHARMA in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.


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Date 16/06/25

Date 16/06/25

DECLARATION BY STUDENT

I hereby declare that this dissertation titled Assessment of Utilization Indicators and their relationship with Quality Indicators monitored in Intensive Care Unit is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



(Signature)

Name of Student GARIMA SHARMA

Date 16/06/25

Acknowledgement

I would like to take this opportunity to thank everyone who helped in completing the project. I remain grateful for their aspiring guidance, invaluable constructive criticism, and amiable salient advice during the project. I am highly indebted to them for sharing with me their frank and enlightening views, spread over several issues pertaining to this project.

I wish to show my deepest sense of gratitude and honour towards the respected Dean DR. Sanjay Gupta, for his inspiration and constant encouragement. To my mentor, Arindam Das, Ph.D, Professor, I feel profoundly indebted. He took an intense interest in my project and continued to guide me till the completion of this project and continued to guide me till the completion of this project work. I thank him for the suggestions.

I am particularly indebted to my organizational mentor, DR. Akanksha Tomar, Quality Head, RJN Apollo Spectra Hospital, Gwalior, Madhya Pradesh and Ms. Sunita Mishra, ICN, who guided, encouraged and further provided insightful comments while I undertook this research.

I would also like to extend my gratitude to colleagues and friends who helped me through with their constant motivation and understanding.

Table of Contents

Titles	Page Numbers
Title Page	2
Declaration by Student	3
Certificate	4
Acknowledgement	5
List of Figures	7
List of Tables	8
Abstract	9
Chapter 1: Introduction	10-12
Chapter 2: Literature Review	13-16
Chapter 3: Research Methodology	17
Chapter 4: Results	18-25
Chapter 5: Discussion	26-27
Chapter 6: Conclusion	28
References	29-30

List of Figures

4.1	Representing graph of Average daily bed occupancy	18
4.2	Representing graph of bed occupancy rate	18
4.3	Representing graph of bed turnover rate	19
4.4	Representing graph of Average length of stay	19
4.5	Representing graph of hand hygiene compliance	20
4.6	Representing graph of ICU readmission rate	20
4.7	Representing graph of VAP rate	21
4.8	Representing graph of CAUTI rate	21
4.9	Representing graph of CLABSI rate	22
4.10	Representing graph of HAPU rate	22
4.11	Representing graph of Phlebitis rate	23

List of Tables

4.1	Representing Tests of Normality	23
4.2	Representing Spearman Rank Correlation Test	24

Abstract

The present study focused on the utilization indicators and quality metrics of critically ill patients in the ICU of RJN Apollo Spectra Hospital, Gwalior, Madhya Pradesh. Both variables play a crucial role in delivering quality care, ultimately leading to patient satisfaction. The study aimed to compare the indicators with the benchmarks derived by the NABH. In addition, it also focused on studying the relationships between ICU utilization indicators and the quality indicators monitored in the ICU. A mixed method was employed for the data collection for the 10-month period (N=10), and the research design was non-experimental. The data was analyzed with the help of Spearman's rank correlation to study the relationship between utilization indicators and quality indicators in the ICU. As a result, it was concluded that the majority of the data on bed turnover rates, CAUTI rate, and CLABSI rate were up to the benchmarks; however, there is a need for little improvement in other indicators. Additionally, there exists a statistically significant negative correlation between average daily bed occupancy and certain quality indicators, including CAUTI rate and HAPU rate at the 0.1 level of significance (Spearman's rho coefficient of 0.589 & 0.549). Further, a significant negative correlation was observed between average length of stay and hand hygiene compliance with a Spearman's rho coefficient of 0.568 at a 10 percent significance level.

Keywords: ICU utilization indicators, Quality indicators, etc.

Chapter 1

INTRODUCTION

An Intensive Care Unit (ICU) is an organized system for the provision of care to critically ill patients that provides intensive and specialized medical and nursing care, an enhanced capacity for monitoring, and multiple modalities of physiologic organ support to sustain life during a period of acute organ system insufficiency. Although an ICU is based in a defined geographic area of a hospital, its activities often extend beyond the physical space to include the emergency department, hospital wards, and follow-up clinics

The factors that form a critical area and make it different from other clinical areas include physical space, support and monitoring technology, human resources, critical area services provided, research education, and quality improvement [1].

In other words, critical care has been defined as the provision of a sophisticated life support system, along with appropriate medications, for a wide variety of patients, in a setting that involves close monitoring. Intensive care unit is a nursing unit specially designed, equipped, and staffed to manage critically-ill patients with potentially reversible lesions, requiring constant observation, irrespective of age, sex, and diagnosis, and requiring extraordinary nursing care. The aim is to support life in a crisis, prevent life-threatening conditions, and then try to remove the cause of dysfunction by specialised treatment and skilled nursing. Every hospital has to have a system that can provide management with the information necessary to plan and control efficient patient care and efficiently manage the hospital. Such information will include trends and data that will improve decision-making, and all this is managed under the Utilization of Services [2].

According to the Ministry of Health and Family Welfare, Hospital services are defined as the use of healthcare services provided by hospitals, including inpatient admissions, outpatient visits, emergency care, and diagnostic or therapeutic procedures. Utilization is typically measured to assess access to care, efficiency of service delivery, and demand for healthcare resources [3].

Many factors affecting utilisation help in identifying aspects of complex interdepartmental relationships that are sensitive to changes, by relating their linkages to utilisation. Different indices are used in the assessment of hospital utilisation, but taken singly, none of them can give a proper picture of the utilisation pattern.

The study includes the following Utilization services for consideration:

Average Daily Bed Occupancy – It refers to the patients per day for a particular period divided by the number of days in that particular period.

Bed Occupancy Rate - Bed occupancy rate indicates the relationship between availability and utilisation of hospital beds. It is calculated as the ratio of actual patient days to the maximum possible patient days during a given period.

Bed Turnover Rate – It gives the number of discharges per hospital bed over a given period, that is, how many times a bed was turned over during the period.

Average Length of Stay – It is the average period in hospital (in days) per patient admitted, i.e., the average number of days of service rendered to each inpatient.

From the above segment, it was clearly understood that the Utilization of services plays a major role in revealing the availability of resources and capacity of the hospital. In addition to the Utilization, there is another important parameter that is very crucial for patient care and satisfaction, namely, Quality of services.

According to WHO, Quality of care is defined as the extent to which health care services provided to individuals and patient populations improve desired health outcomes [4].

Quality management seeks to improve the effectiveness of treatments and increase patient satisfaction with the service. With an ageing population and the rising healthcare costs, quality management in healthcare is gaining increased attention. A healthcare system comprises small and large entities such as pharmacies, medical clinics, and hospitals, and all components need to provide quality service for the system to work appropriately. Effective quality management is focused on the needs of the patients because they are the ones who judge the effectiveness of treatments and the appropriateness of the service. Patients' needs and expectations change over time consequently, sound quality management calls for constant monitoring of the patient's progress and satisfaction with the service [5].

Quality of services is maintained and improved by measuring relevant quality measures and indicators. Quality indicators are the tools used to identify potential areas of improvement in the quality of care. In hospital settings as well as in the ICU, these indicators can be classified into three categories based on the Donabedian concept: structure, process, and outcome. Some of the Indicators include ICU occupancy,

Mortality, ICU readmission within 48 hours, Length of stay, and Hand hygiene, among others. The indicators that are monitored and observed for the current study are as follows:

Hand Hygiene Compliance – it is an important indicator that helps reduce hospital-acquired infections, calculated by the number of healthcare providers performing the six steps of hand washing, along with five moments of hand hygiene, divided by the number of healthcare providers observed.

ICU Readmission Rate Within 48 hours – this indicator is related to patient outcome and hospital efficiency. It is calculated by the number of patients readmitted within 48 hours divided by total discharges multiplied by hundred.

Catheter-Associated Urinary Tract Infections – It is probably one of the most common infections in the ICU. It is denoted by the number of CAUTI cases divided by total urinary catheter days. The measure is reported per 1000 catheter days.

Central Line Associated Blood Stream Infection – it is considered as a significant indicator due to its association with morbidity, mortality, and cost of services. It is denoted by the number of cases with a laboratory-confirmed bloodstream infection associated with a central venous catheter. The measure is expressed by 1000 line days.

Ventilator Associated Pneumonia – The most critical situations in the ICU are for the ventilated patients, either via Endotracheal Tube (ET) or by Tracheostomy, also called Tracheal tube, both of which may lead to pneumonia if not taken properly. It is measured by the number of pneumonias occurring in patients requiring invasive ventilation through a tracheostomy or endotracheal tube (in place for at least 2 consecutive days before the onset of infection), divided by the number of ventilated days in the ICU in that period.

Hospital-Acquired Pressure Ulcers – This is related to the quality of care delivered by the hospital staff, which restricts the development of pressure ulcers in patients. It is calculated by the number of pressure ulcers developed in patients divided by the total patient days.

Thromboprophylaxis in ICU patients – It is denoted by the number of patients who developed it divided by the total IP Days of ICU [6].

Chapter 2

REVIEW OF LITERATURE

Utilization of hospital services plays a major role in providing quality care to patients by managing and arranging for different resources in the hospital premises, requiring patient treatment follow-up. This becomes even more essential when dealing with critical patients in the Intensive Care Unit. Various studies have been conducted to understand the relevance of ICU Utilization Indicators, some of which are discussed below.

A research aimed at studying the association between ICU utilization during hospitalization, costs, use of invasive procedures and mortality and also whether the utilization of services is consistent with four common medical conditions namely, Diabetic Ketoacidosis (DKA), Pulmonary embolism (PE), Upper Gastro-intestinal Bleeding (UGIB), and Congestive Heart Failure (CHF). As a result, it was observed that DKA patients and PE patients have registered the highest and lowest admission rates, respectively. Additionally, it was concluded that ICU Utilization and use of invasive procedures and costs were positively correlated, whereas no association was found with mortality rates, and also the Utilization pattern was similar across the four medical conditions [7].

Healthcare is an important aspect in today's scenario, and palliative care is the most recent version of it, followed by preventive, curative, and rehabilitative care. Khandelwal et al. (8) hypothesized to study the effect of palliative care on adult patients with admission rates and length of stay in the ICU. As a result, it was concluded that patients who received palliative care reported a significant decline in admission rates, as well as length of stay was also reduced for these patients. On the contrary, research was conducted by Hill et al. (9) to study the long-term effects and healthcare utilization in critical patients after discharge, with age as an essential observable factor. As a result, it was concluded that utilization of healthcare services, be it readmission to ER or ICU departments, rehabilitative services, home care, etc., was higher in patients discharged from the ICU. Additionally, the critical patients who have utilized more resources at the time of ICU admission and elder male patients reported higher healthcare utilization and were at high risk of long-term mortality after discharge.

Similarly, considering age as a factor, a study aimed to identify the relationship between clinical frailty and ICU utilization and outcomes in older patients with suspected

infection. It was found that the clinical frailty was associated with higher mortality, long-term care, re-admission, re-admission, utilization of services, and costs. Additionally, it was also concluded that assessment of clinical frailty is an important factor while categorizing the older patients who may develop infections [10].

Another study was conducted to study the effect of ICU bed availability on transferring patients from the ER to the ICU and its outcomes. As a result, it was observed that patients who have waited long for boarding in the ICU due to unavailability of beds have shown worse outcomes, along with higher mortality rates [11].

Mercader & Siciliani have introduced a new perspective, which is the quality of care that could be affected by the bed occupancy. In a study, it was hypothesized to study the effect of high bed occupancy rate on some quality parameters. As a result, it was concluded that a high bed occupancy rate was positively correlated with surgical mortality and negatively correlated with health gains of patients; that is, high bed occupancy rate affects the quality of care to some extent [12].

Based on the above research, it was clearly understood that ICU Utilization plays a significant role in patient's outcomes. Now, let's understand these outcomes in a more detailed way with the help of Quality Indicators in the ICU. Several pieces of research have been done to study the quality of care in critically ill patients, some of which are as follows.

Dorzi & Arabi (6) conducted a study to list the Quality indicators of the critical patients and also to identify the scope for improvement. As a result, it was concluded that various indicators play a significant role in quality care, including bed occupancy, length of stay, hand hygiene, re-admissions within the ICU, compliance with care bundles, etc. In addition, it was found that proper monitoring is required for assessing the indicators, and training needs to be given to the staff, which will result in quality improvement.

A study was conducted to examine the quality indicators involved with Traumatic brain injury patients and their associated barriers. It was resulted that there are total 17 Structural (existence and presence of guidelines and audits, availability of operating rooms, specialised dedicated neurosurgeons, nurse-patient ratio, etc.), 16 Process (such as 24x7 diagnostic services, patients received prophylaxis number of patients visited physiotherapist etc.) and 9 outcome indicators (number of deaths, VAP cases, patients with severe sepsis etc.) involved with patients. In addition, the facilitators for implementing the quality indicators include data collection, external workforce, feedback,

programs on quality improvement where whereas there are certain barriers for the same, including administrative burden, fear of benchmarking and future pay, and accountability [13].

Another research was done to study the most prominent causes of ICU readmission, as it is an essential quality indicator indicating patient outcome and organizational efficiency. It was concluded that patients with surgical admissions at the time of ER, severity of disease, infection rates, high Sequential Organ Failure Assessment (SOFA), immunodeficiency, and elderly patients were the most common causes of re-admission within 24, 48, and 72 hours [14].

In a study by Rewa et al. (15), a new factor was introduced, namely Strained Intensive Care Unit, which refers to the imbalance between supply and demand capacities in the ICU. The study aimed to identify the indicators that are responsible for promoting strained ICU. As a result, it was observed that 16 Quality indicators leading to strained ICU resources, including surgery cancellations, job satisfaction, ICU readmissions, Early ICU Discharge, and Daily rounds by intensivists, etc.

Apart from patients, the informants play a crucial role in assessing the quality of care in ICU patients. A study was conducted to assess the quality of care from the informant's point of view via feedback. It was found that, highest ratings were given to patients' concerns, atmosphere of the ICU, and information dissemination. On the other hand, improvement is needed in patient agitation, empathetic behaviour of staff, and inclusion of family members in decision-making [16].

Rationale of the Study

The present study attempts to ascertain the utilization of services and quality indicators of critically ill patients in the ICU. Various studies have retrospectively focused on these variables, and little attention has been given to collecting real-time data, that is, formulating a prospective study to develop insights based on utilization metrics, clinical outcomes, and real-time experiences. The present study is being carried out to highlight real-time data as well as to have a record of retrospective data. The study focused on assessing the ICU utilization indicators and quality indicators in the ICU. Additionally, it examines the relationship between ICU Utilization and Quality Indicators in the ICU.

Objectives

- To assess ICU Utilization parameters, including Average Daily Bed Occupancy, Bed Occupancy Rate, Bed Turnover Rate, and the Average length of stay.
- To monitor ICU quality indicators, including hand hygiene compliance, ICU readmission within 48 hours, Compliance with Bundle care, and Thromboprophylaxis compliance.
- To explore the relationship between ICU Utilization indicators and Quality indicators in an Intensive Care Unit.

Hypotheses

H0: There will be no significant correlation between ICU Utilization indicators and Quality indicators in the ICU.

H1: There will be a significant correlation between ICU Utilization indicators and Quality indicators in the ICU.

Chapter 3

RESEARCH METHODOLOGY

Method

A non-experimental cross-sectional research design is been used to examine the relationship between the indicators of the Intensive Care Unit.

Sample

Purposive sampling, a kind of non-probability sampling, was used for data collection from the sample. The sample size for the study was 10, that is, (N=10), since the study utilized the data of 10 months instead of focusing on individual patients.

Variables

The following variables are taken into account for the present study in two broad categories that is, ICU utilization indicators including average daily bed occupancy, bed occupancy rate, bed turnover rate, average length of stay, and the quality indicators including hand hygiene compliance, ICU readmission within 48 hours, VAP rate, CAUTI rate, CLABSI rate, HAPU rate and thrombophlebitis rate.

Exclusion and Inclusion Criteria

Inclusion:

Firstly, the participants must belong to the Intensive Care Unit.

Secondly, both genders are selected for the study.

Thirdly, patients in both the ICUs are included.

Exclusion:

Firstly, NICU patients are excluded from the study.

Secondly, patients from other wards are excluded from the study.

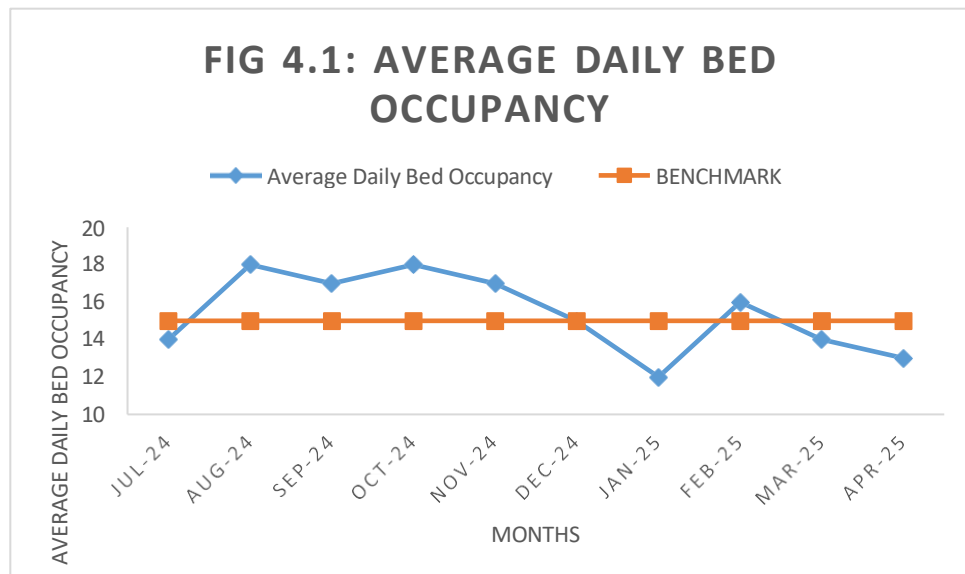
Statistical Tests:

Spearman Rank Correlation is used to examine the relationship between utilization and quality indicators in ICU.

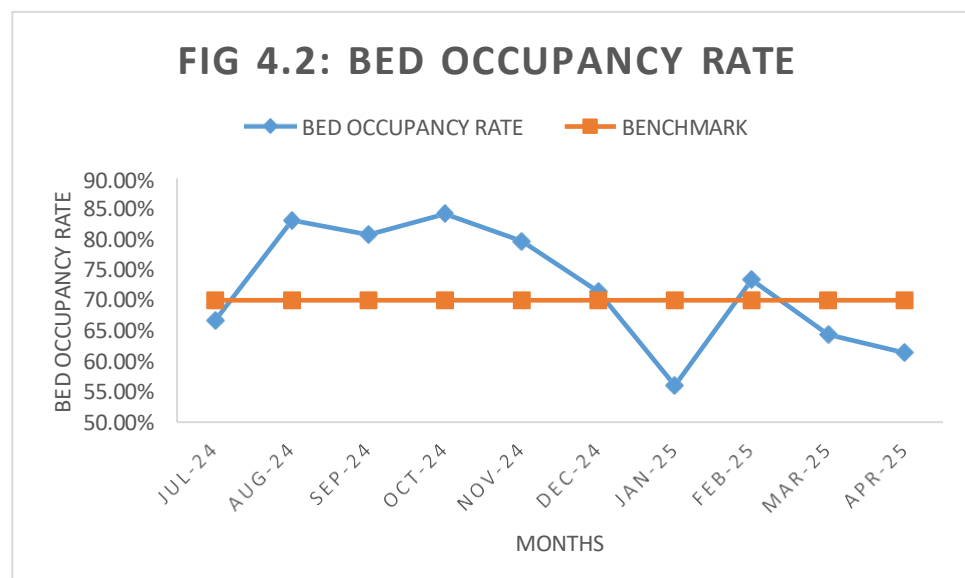
CHAPTER 4

RESULT

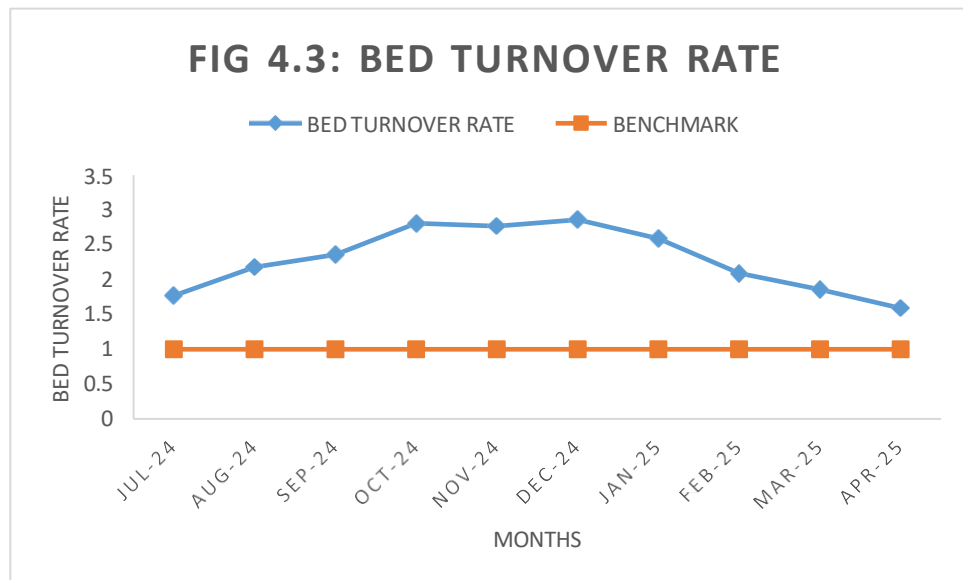
An analysis is carried out to assess, correlate, and predict the outcome variables with the help of the utilization of services. It is worth mentioning that the critically ill patients are the participants from the multispecialty hospital in Madhya Pradesh. The data is collected and assessed for the period of 10 months, and the results are as follows:



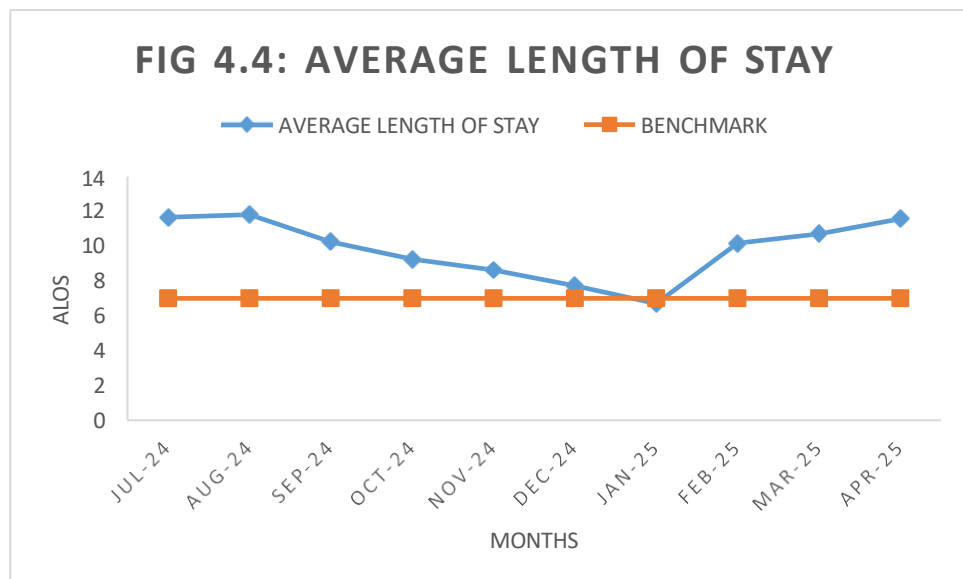
The above data showed the average daily bed occupancy for the period of ten months, and it was observed that four indices fall under the category of non-compliance.



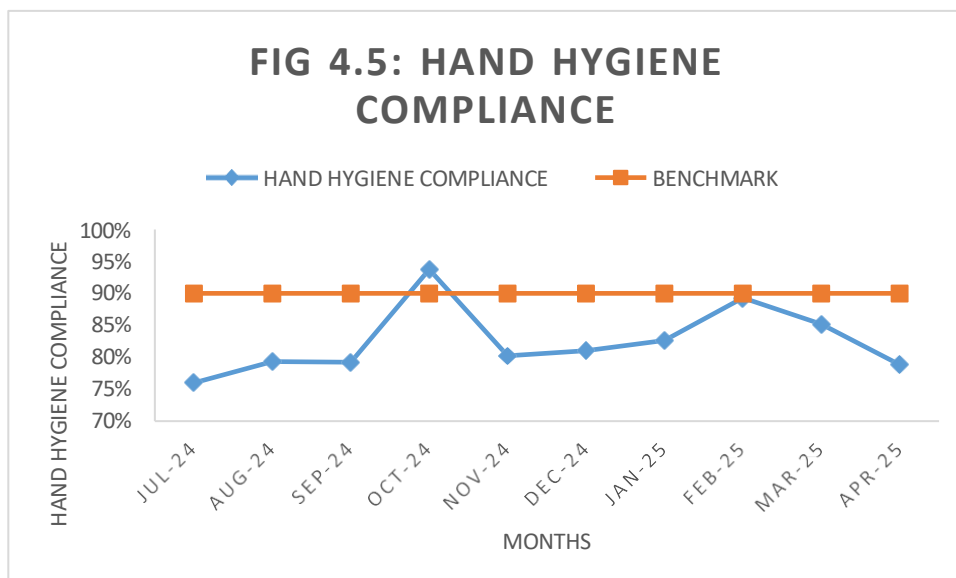
The above graph shows that there is a deviation in bed occupancy rate in four months, and the minimum occupancy is reported in the month of January. It was due to a lower number of inpatient admissions of critically ill patients.



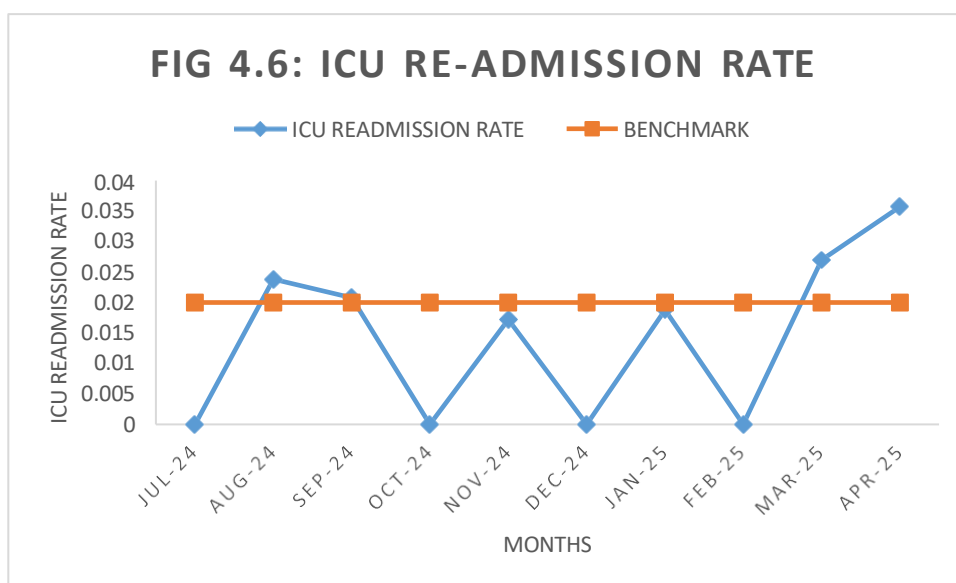
The above data resulted in the bed turnover rate within the recommended period falling under the category of NABH compliance.



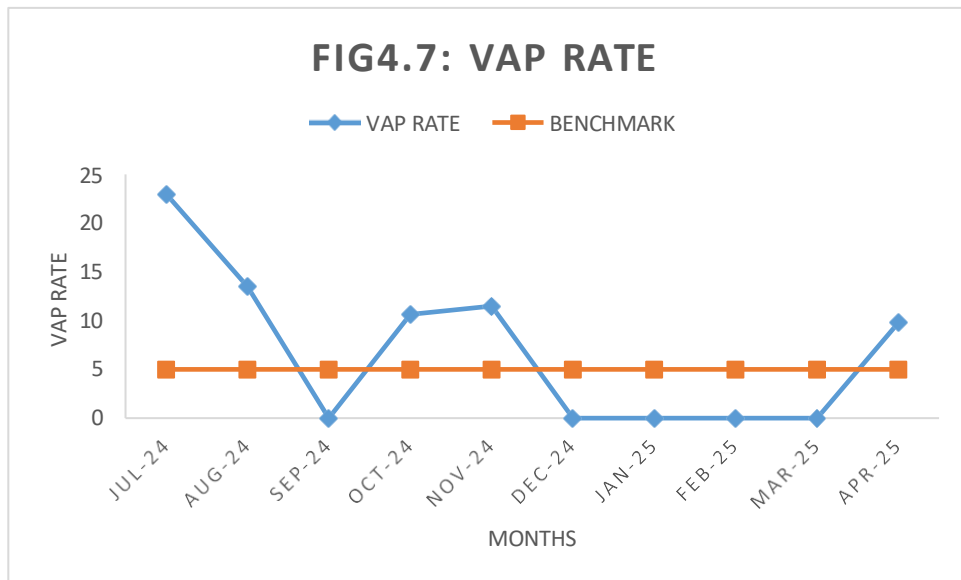
It was observed from the above graph that, average length of stay falls under the category of non-compliance for the majority of the indices. One of the reasons was the patients who suffered from brain injury required more time to recover.



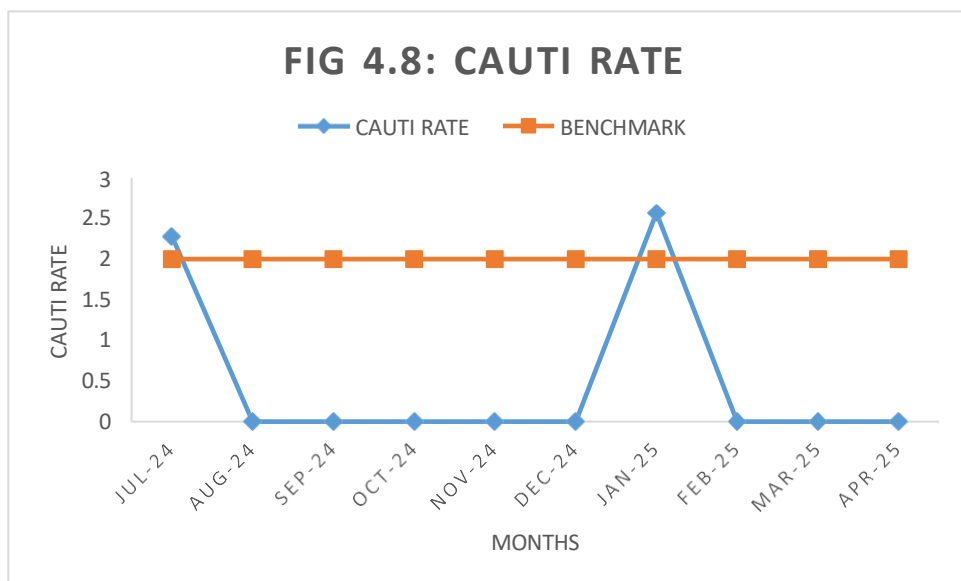
The above graph shows the requirement of hand hygiene training for the staff, as the majority of the data displayed non-compliance. One of the reasons was patient load on the staff due to the unavailability of sufficient nursing staff.



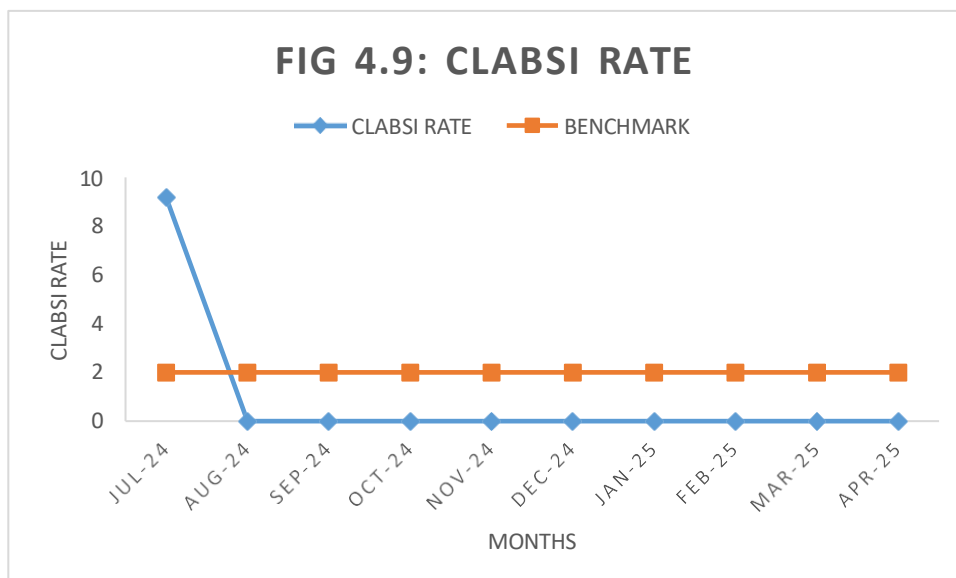
The above data showed major changes in readmission rates of patients; besides this, it falls under the compliance category. Although recently deviation was observed mainly due to the inability of the informants to after the patients.



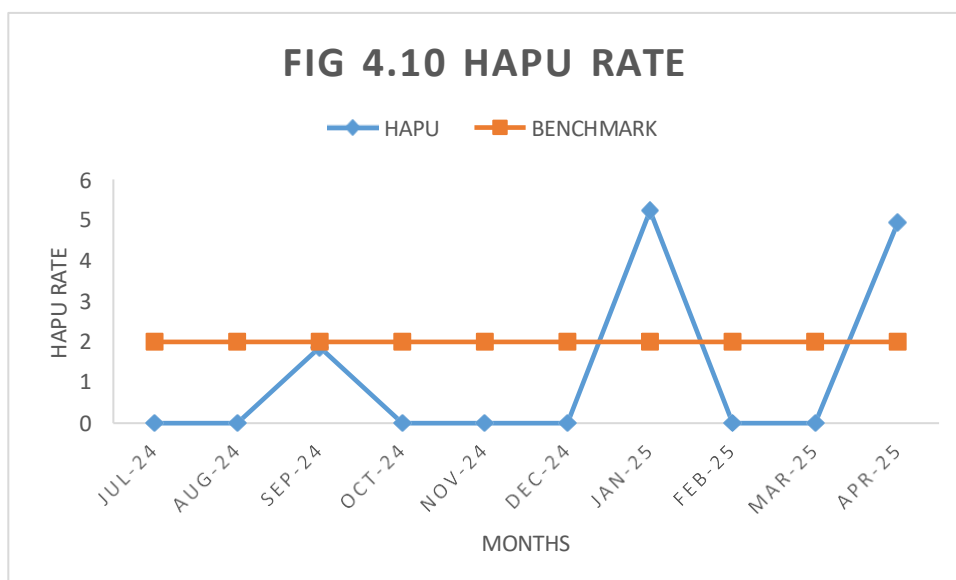
It was clearly observed that, there are remarkable improvement in the infection rates of ventilated patients. But, again more attention is required in terms of nurse patient ratio, proper surveillance and documentation, hand hygiene practices and Endotracheal tube care.



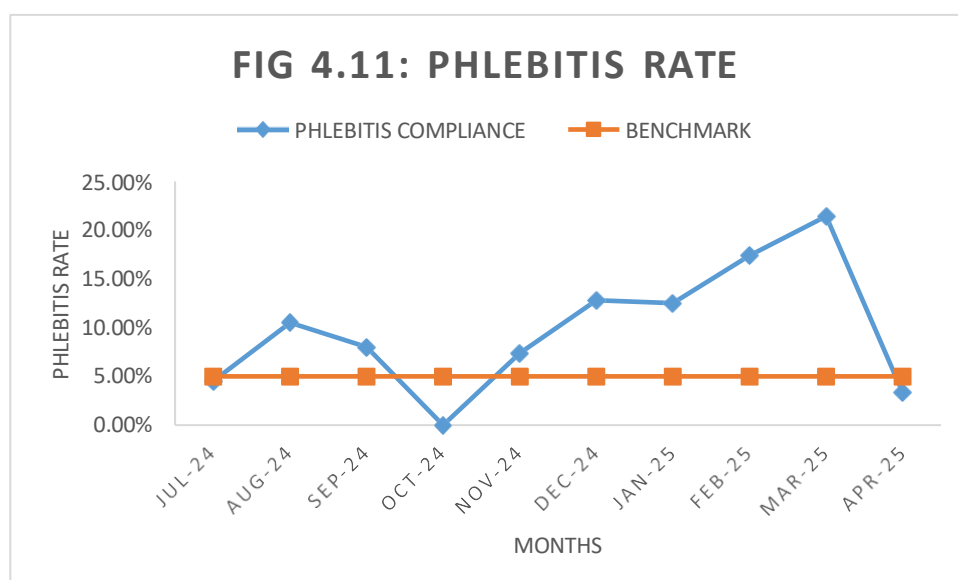
Based on the above data, it was observed that there is a remarkable improvement in the CAUTI rates by providing adequate training to the staff as a result, the majority of the data comes under compliance recommended by NABH.



It was clearly interpreted that data showed no deviation from compliance rates, as a result of which zero infection rates are consistent throughout the period.



It was observed that, at two indices, the bed sores come under the non-compliance rates. One of the main reasons was improper documentation and handovers among the nursing staff.



The above graph shows that the majority of the indices fall under non-compliance suggested by NABH guidelines. As a result of which investigations are done, which are followed by proper monitoring of critically ill patients that leading to maintaining the phlebitis infection rates in critically ill patients.

After assessing the above data and identifying the compliances and non-compliances based on the NABH compliance rates. The present study focused on studying the relationship between utilization indicators and quality outcomes of the ICU.

For the same, the data was entered into the Statistical Package for Social Sciences (SPSS) for performing the statistical analysis, the following results were obtained. Table 4.1 demonstrates the results of the Shapiro-Wilk Test, which is used for testing normality of the data for the ten variables.

Table 4.1: Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Average Daily Bed Occupancy	.175	10	.200*	.933	10	.475
Bed Occupancy Rate	.181	10	.200*	.939	10	.543
Bed Turnover Rate	.381	10	.000	.640	10	.000
Average Length of Stay	.172	10	.200*	.919	10	.350
Hand Hygiene Compliance		10	.200*	.892		
ICU Readmission Rate	.259	10	.056	.860	10	.077
VAP Rate	.303	10	.010	.812	10	.021
CAUTI Rate	.478	10	.000	.539	10	.000
CLABSI Rate	.524	10	.000	.366	10	.000
HAPU	.141	10	.200*	.939	10	.542
Phlebitis Compliance	.181	10	.200*	.965	10	.841

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

It is evident from Table 4.1 that the p-values for Average daily bed occupancy, Bed occupancy rate, Average length of stay, Hand hygiene compliance, rate of HAPU, and Thrombophlebitis compliance are significant at the 0.05 level of significance ($p = 0.47, 0.54, 0.35, 0.18, 0.54 \text{ \& } 0.84 > 0.05$). On the other hand, the p-values were insignificant for Bed turnover rate, ICU re-admission rate, VAP rate, and CAUTI rate at a 0.05 significance level. As a result, it can be concluded that the data is not normally distributed.

The relationship between ICU Utilization Indicators and Quality Indicators in the ICU is analysed using the Spearman Rank Correlation test, as the data doesn't meet the assumptions of normality.

Table 4.2: Spearman Rank Correlation Test

		HHC	RAR	VAP	CAUTI	CLABSI	HAPU	PHL
ADBU	Correlation Coefficient	.208	-.240	.347	-.589**	-.234	-.549**	-.252
	p-value	.564	.505	.326	.073	.515	.100	.483
	N	10	10	10	10	10	10	10
BOR	Correlation Coefficient	.188	-.300	.350	-.545	-.174	-.515	-.316
	Sig. (2-tailed)	.603	.399	.321	.103	.631	.128	.374
	N	10	10	10	10	10	10	10
BIR	Correlation Coefficient	.426	-.440	-.076	.152	-.272	-.1.72	-.143
	Sig. (2-tailed)	.219	.203	.835	.675	.447	.636	.694
	N	10	10	10	10	10	10	10
ALOS	Correlation Coefficient	-.568**	.440	.502	-.159	.414	-.186	-.220
	Sig. (2-tailed)	.087	.204	.139	.662	.235	.606	.542
	N	10	10	10	10	10	10	10

Note: **Correlation is significant at the 0.1 level (2-tailed).

Table 4.2 represents Spearman Rank Correlation. It can be observed from the table that a significant negative correlation exists between the Average daily bed occupancy and CAUTI rate and HAPU rate of ICU patients, with a Spearman's rho coefficient of 0.589 and 0.549 at a 0.1 level of significance. Additionally, there is a significant negative correlation between the Average length of stay and Hand hygiene compliance of ICU patients, with a Spearman's rho coefficient of 0.568 at a 0.1 significance level. The impact

of average daily bed occupancy on CAUTI rate is analysed with the help of regression analysis.

Chapter 5

DISCUSSION

Based on the above results, it can be inferred that among ICU utilization indicators, bed turnover rate showed the highest compliance in comparison to other indicators, whereas average length of stay is a matter of concern from the point of view of compliance rates.

In addition, in the case of quality indicators, CAUTI rate and CLABSI rate manifested the best output, which are the results of proper training, documentation, and monitoring of patients by the staff. Further, ICU re-admission within 48 hours, HAPU rate, and phlebitis rate in ventilated patients still need to improve a little. Whereas, a lot of attention is required for ensuring hand hygiene practices among the staff for improving hand hygiene compliance, which may further help to enhance other quality indicators. In this way, the present study has manifested the results of the objectives to assess and monitor the ICU utilization indicators and quality indicators.

Another objective of the study was to explore the relationship between ICU Utilization indicators and Quality indicators in an Intensive Care Unit. The Pearson Rank Correlation test was performed to test the hypothesis “there will be a significant correlation between ICU Utilization indicators and Quality indicators in the ICU.” Based on the obtained results, it can be observed that the Spearman’s rho coefficients for CAUTI rate and HAPU rates with average daily bed occupancy were -.589 and -.549 respectively which were significant at 10 percent level of significance (rho coefficient = -.589, $p = 0.073 < 0.1$; rho coefficient = -.549, $p = 10$). This means that there exists a significant negative correlation between average daily bed occupancy and CAUTI rates, and also between average daily bed occupancy and HAPU rates of critically ill patients in the ICU. Although this relationship is difficult to understand, one of the reasons could be in case of higher occupancy, better supervision and monitoring was done, the staff and incharges are more accountable during audits by the hospital staff (Table 4.2).

Additionally, results also showed there exists a significant negative correlation between average length of stay and hand hygiene compliance of critically ill patients at a 10 percent significance level (rho coefficient = -.568, $p = 0.087 < 0.1$). This means that as the number of days for the particular patient increases, the hand hygiene practices by the staff decreases that is, the staff become less vigilant towards the patient in terms of hand hygiene. Therefore, it can be concluded that the present study accepts the first hypothesis,

which was “there exists a significant correlation between ICU Utilization indicators and Quality indicators in the ICU” (Table 4.2).

Strengths of the Study

The study was conducted in a real healthcare setting, that is, the ICU of a tertiary-level hospital.

The incorporation and assessment of utilization indicators and quality indicators have made the study more reliable and valid.

The inclusion of care bundles helps to assess the compliance and non-compliance rates of the utilization and quality indicators.

The analysis with the use of Spearman rank correlation and linear regression helps to statistically verify the significance of the relationships and effect among the variables.

Limitations of the Study

The present study was able to reach successful findings with the help of the participants, statistical tools, and tests used, but apart from this, there were certain limitations, which are as follows:

The study included a small sample size, that is, a period of 10 months (N=10).

The study included only the critically ill patients in the Intensive Care Unit.

The data was collected with the help of questionnaires only, and any sort of qualitative method, such as an interview, case study, etc., was not used in the study.

The research does not provide any kind of intervention for the participants.

Chapter 6

CONCLUSION

Based on the above results and discussion, it can be concluded that the bed turnover rate, CAUTI rate and CLABSI rate fall under the category of compliance whereas, little attention need to be given on the average length of stay, ICU readmissions within 48 hours, HAPU and phlebitis rates however, majority of hand hygiene compliance fall under non-compliance.

Further, after the analysis, it was found that there exists a statistically significant negative correlation between average daily bed occupancy and CAUTI rate, average daily bed occupancy and HAPU rate, and average length of stay and hand hygiene compliance. Therefore, it can be concluded that the hypothesis “there exists a significant correlation between ICU Utilization indicators and Quality indicators in the ICU” is been accepted.

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