

RESEARCH ARTICLE

STUDY OF RATE, CAUSE AND PATTERN OF HOSPITAL READMISSIONS IN EMERGENCY MEDICINE OF A TERTIARY CARE HOSPITAL IN NORTH INDIA

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Manuscript Info

Abstract

Manuscript History Received: 19 November 2023 Final Accepted: 29 December 2023 Published: January 2024 **Introduction:** Hospital readmission rates serve as crucial indicators of healthcare quality, with significant implications for patient outcomes and financial costs. This study aims to investigate the rates, causes, and patterns of hospital readmissions in the emergency medicine department of a tertiary care hospital in North India.

Methodology: A prospective study spanning one year was conducted, involving 4116 patients admitted through emergency medicine. The study analyzed readmission rates at different intervals (7 days, 30 days, 90 days, and 1 year) and considered demographic factors, primary diagnoses, and comorbidities. Data were collected through systematic random sampling and reinforced with semi-structured interviews and administrative records.

Results & Observations: The study revealed varying readmission rates across different time intervals and diagnoses. Gastrointestinal disorders and respiratory diseases consistently exhibited elevated readmission rates. Age, gender, and Charlson Comorbidity Index were identified as significant factors influencing readmission patterns. Patients aged 50-59 years and males demonstrated higher readmission rates. The severity of comorbidities, as measuredbytheCharlson Comorbidity Index, was positivelycorrelated with increased readmission rates.

Discussion: The findings underscore the importance of targeted postdischarge care, disease-specific interventions, and tailored strategies for specific demographics. The study emphasizes the need for enhanced monitoring and interventions, especially in the later stages postdischarge. Patient-centric insights highlight the role of discharge readiness and patient perceptions in influencing readmission dynamics.

Conclusion: This study provides comprehensive insights into the complex factors influencing hospital readmissions in the emergency medicine setting. It emphasizes the necessity for focused interventions, customized care strategies, and all-encompassing approaches to reduce readmission risks. Healthcare institutions are encouraged to prioritize transitional care, interdisciplinary collaboration, evidence-based interventions, and patient-centered care models to optimize patient outcomes and alleviate the economic burden associated with avoidable readmissions.

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Introduction:-

Hospital readmission is defined as a scenario in which a patient, after discharge, is readmitted within a specified timeframe¹. Across numerous healthcare systems, the rate of hospital readmissions (RR) has emerged as a pivotal indicator of the quality of care rendered². The underlying premise for monitoring readmissions is rooted in the belief that they often signify substandard care³. When viewed through the lens of the Donabedian model, this metric can be perceived as an intermediate outcome indicator, acting as a proxy for adverse events or positive outcomes, such as enhanced life expectancy or diminished morbidity⁴. As the focus on readmission rate intensifies, it is becoming increasingly evident that hospital readmission serves as a litmus test for the quality of hospital care⁵.

Statistics for the United States are staggering. Almost 20% of patients find themselves readmitted within 30 days post-discharge, culminating in an astronomical annual expenditure of 17 billion dollars⁶. To curb this trend, Medicare's Hospital Readmissions Reduction Program (HRRP) docked hospitals with a staggering sum exceeding \$500 million in penalties for elevated readmission rates in 2017⁷. Such punitive measures underscore the need for hospitals to recalibrate their strategies and reduce readmissions⁸.

While the global discourse on readmission rates has gained momentum, it is noteworthy that a conspicuous research gap remains in specific geographical contexts. Notably, comprehensive studies addressing hospital readmissions as quality indicators in India are scarce⁹. Recognizing this lacuna and the absence of empirical data from our institution, especially concerning patients admitted through the emergency department, this research endeavours to illuminate the landscape of readmission rates¹⁰. This study was designed to ascertain readmission rates. Furthermore, our objective was to identify and establish the patterns and causes underlying these readmissions¹¹. By undertaking this research, we aim to contribute valuable data that can inform future strategies and interventions in specific healthcare settings¹².

Methodology:-

ToStudyRateofReadmissionsin medical emergency, "a prospective study of one-year duration with effect from 01-01 -2019 was carried out in the medical emergencyby studying admitted patients". Considering the number of patients admitted via emergency medicine, a sample size of 20% was obtained by systematic random sampling, which was calculated by assuming a 5% significance level, the readmission rate of 30% (0.17), and the margin of error(e) was 1.4%, the sample was calculated to be 4116.

The dataset was further divided based on age and diagnosis time frame of readmissions within. (1)7 days (2)30 days (3)90 days (4)1 year. Data collected was reinforced with semi structured Interviews

To study cause and pattern of readmissions, a prospective analysis of the patient files, discharges, and medical history was undertaken, and the data was reinforced with administrative data from the electronic admission register of the hospital.

A dataset comprising primary diagnosis at the time of discharge and primary diagnosis at the time of readmission was compiled among different age groups based on the data collected in a prospective study over a span of 12 months Comorbiditieswere assessed using the Charlson Comorbidity Index (CII).

Results & Observations:-

At 7 days readmission in medical emergency, 4(5.1%) of the 79 CKD patients were readmitted, 6(4.1%) of the 147 with heart disease were readmitted, 6(7.4%) of 81 patients with neoplasms were readmitted, 7(6.3%) of 112 patients were readmitted with infections, 4(6.6%) of 61 patients with diabetes and other metabolic disorders were readmitted, 4(6.6%), 4(5.9%) patients with neurological disorders were readmitted at 7 days, 8(9.8%) of the 82 patients with gastrointestinal disorders needed readmission at 7 days and 20 (10%) of the 201 patients with CAP and other respiratory diseases were also readmitted. 6(4.3%) of 140 patients with other ailments were readmitted at 7 days.

Table1:- Readmissionrateasperindexadmissionat7daysinmedicalemergency.				
Diagnosis	No. ofpatients	Readmission rate		
		Ν	%	

CKD	79	4	5.1	
Heartdisease	147	6	4.1	
Neoplasms	81	6	7.4	
Infections	112	7	6.3	
Diabetesandothermetabolicdisorders	61	4	6.6	
Neurologicaldisorders	68	4	5.9	
Gastrointestinaldisorders	82	8	9.8	
Capandotherrespiratorydiseases	201	20	10.0	
Others	140	6	4.3	
Chi-square=8.061;P-value=0.427				

readmission at 30 days was seen in 16.5% CKD patients, 16.3% patients with heart diseases, 16% patients with neoplasms, 17% patients with infections, 16.4% patients with diabetes and other metabolic disorders, 17.6% patients with neurological disorders, 17.1% patients with gastrointestinal disorders, 16.9% patients with CAP and other respiratory diseases while as 12.9% patients with other diseases were also sought readmission at 30 days with a statistically insignificant difference (p 0.994).

Table2:-Readmissionrateasperindexadmissionat30daysinmedicalemergency.				
	No.	Readmission	Readmissionrate	
Diagnosis	ofpatients	Ν	%	
CKD	79	13	16.5	
Heartdisease	147	24	16.3	
Neoplasms	81	13	16.0	
Infections	112	19	17.0	
Diabetesandothermetabolicdisorders	61	10	16.4	
Neurologicaldisorders	68	12	17.6	
Gastrointestinaldisorders	82	14	17.1	
Capandotherrespiratorydiseases	201	34	16.9	
Others	140	18	12.9	
Chi-square=1.437;P-value=0.994				

readmission at 90 days was seen in 20.3% CKD patients, 20.4% patients with heart diseases, 21% patients with neoplasms, 20.5% patients with infections, 19.7% patients with diabetes and other metabolic disorders, 20.6% patients with neurological disorders, 22% patients with gastrointestinal disorders, 21.4% patients with CAP and other respiratory diseases while as 16.4% patients with other diseases also sought readmission at 30 days with a statistically insignificant difference (p 0.991).

Table3:- Readmissionrateas perindexadmissionat90daysinmedicalemergency.				
	No.	Readmissionrate		
Diagnosis	ofpatients	Ν	%	
CKD	79	16	20.3	
Heartdisease	147	30	20.4	
Neoplasms	81	17	21.0	
Infections	112	23	20.5	
Diabetesandothermetabolicdisorders	61	12	19.7	
Neurologicaldisorders	68	14	20.6	
Gastrointestinaldisorders	82	18	22.0	
Capandotherrespiratorydiseases	201	43	21.4	
Others	140	23	16.4	
Chi-square=1.631;P-value=0.991				

readmission at one year was seen in 32.9% CKD patients, 32.7% patients with heart diseases, 33.3% patients with neoplasms, 32.1% patients with infections, 32.8% patients with diabetes and other metabolic disorders, 29.4% patients with neurological disorders, 32.9% patients with gastrointestinal disorders, 33.3% patients with CAP and

other respiratory diseases while as 25.7% patients with other diseases also sought readmission at one year with a statistically insignificant difference (p 0.991).

Table4:- Readmissionrateasperindexadmissionatoneyearinmedicalemergency.				
		Readmissionrate		
Diagnosis	No.	N	%	
	ofpatients			
CKD	79	26	32.9	
Heartdisease	147	48	32.7	
Neoplasms	81	27	33.3	
Infections	112	36	32.1	
Diabetesandothermetabolicdisorders	61	20	32.8	
Neurologicaldisorders	68	20	29.4	
Gastrointestinaldisorders	82	27	32.9	
Capandotherrespiratorydiseases	201	67	33.3	
Others	140	36	25.7	
Chi-square=1.631;P-value=0.991				

Readmission at one year was seen more in patients i.e. aged between 50-50 years (58.1%), followed by 49.2% patients aged >60 years, 40-49 years (32.1%), 30-39 years (29.2%), 20-29 years and 10-19 (19.6%) each while as 16.3% readmission rates were observed in patients aged <10 years. Correlation of age with readmission at one year was found to be statistically significant (p < 0.001).

Table5:- Readmissionrateaccordingtoageat1year.				
		Readmissionrate		
Age(Years)	No.ofpatients	Ν	%	
<10	657	107	16.3	
10-19	489	96	19.6	
20-29	571	112	19.6	
30-39	473	138	29.2	
40-49	683	219	32.1	
50-59	527	306	58.1	
≥60	895	440	49.2	
Total	4295	1418	33.0	
Chi-square=427.58;P-value<0.001(Statisticallysignificant)				

Correlation of readmission rate with gender was found to be statistically significant (p < 0.001) with majority of patients were males 38.8% (n=917) against 25.9% (n=501) females

Table6:- Readmissionrateaccordingtogenderat I year.				
		Readmissionrate		
Gender	No.ofpatients	Ν	%	
Male	2362	917	38.8	
Female	1933	501	25.9	
Total	4295	1418	33.0	
Chi-square=80.05;P-value<0.001(Statisticallysignificant)				

Readmission as per Charlson Comorbidity Index (CCI), the more the score increased is the readmission rate with 57.7% (n=312) having severe CCI (>5) followed by 45.8% (n=214) having moderate CCI (3-4)scores.

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	No.	Readmissionrate		
CCIScore	ofpatients	N	%	
NoCCI(0)	2046	413	20.2	
MildCCI(1-2)	1241	479	38.6	

ModerateCCI(3-4)	467	214	45.8	
SevereCCI(≥5)	541	312	57.7	
Total	4295	1418	33.0	
Chi-square=353.13;P-value<0.001(Statisticallysignificant)				

A total of 1418 patients at SKIMS were interviewed for this survey during the period of 1 year. All of them had been readmitted to the hospital within 7 days,30 days, 90 days ,1 year of discharge from the hospital to their home, A theme that emerged was discharge readiness. While some of the respondents stated they were discharged "too soon," they acknowledged that they were aware that they had a right to appeal the discharge decision, but did not opt for that choice. It appeared that patients do not challenge the doctor's discharge decision

Discussion:-

The study offers a thorough investigation into hospital readmissions from a medical emergency standpoint, emphasizing various timeframes, patient demographics, and primary diagnoses¹³. Several critical insights emerge from this comprehensive analysis.

Firstly, the differential readmission rates across specific time intervals (7 days, 30 days, 90 days, and 1 year) underscore the importance of targeted post-discharge care¹⁴. Confirming the critical early post-discharge period (3-7 days) for readmissions, as seen in Jacobs et al. (2018) and Nguyen et al. (2014), highlights the need for targeted interventions during this timeframe The escalating rates over extended periods indicate potential gaps in transitional care, highlighting a pressing need for enhanced monitoring and interventions, especially in the later stages post-discharge¹⁵.

Secondly, disease-specific analyses reveal varying vulnerabilities across different medical conditions¹⁶. Notably, gastrointestinal disorders and respiratory diseases consistently exhibited elevated readmission rates. The study aligns with Nguyen et al. (2014) by identifying COPD, pneumonia, and heart failure as vulnerable areas, suggesting tailored post-discharge strategies for these high-risk groups Such findings necessitate specialized post-discharge care protocols and proactive management strategies tailored to specific diagnoses to mitigate avoidable readmissions¹⁷.

Moreover, demographic variables, including age and gender, significantly influence readmission patterns¹⁸. The pronounced susceptibility observed among elderly patients underscores their heightened vulnerability and emphasizes the imperative for age-specific interventions¹⁹.

Furthermore, the Charlson Comorbidity Index elucidates the intricate interplay between comorbidities and readmission rates²⁰. The escalating readmission rates corresponding to higher CCI scores accentuate the multifaceted challenges posed by concurrent health conditions. Addressing comorbidities comprehensively and integrating holistic care approaches is paramount to curbing readmissions effectively²¹.

Lastly, the patient-centric insights elucidate the pivotal role of discharge readiness and patient perceptions in influencing readmission dynamics²². Enhancing patient engagement, fostering transparent communication, and promoting shared decision-making can empower patients, optimize discharge planning, and augment post-discharge outcomes.

Conclusion:-

In conclusion, This study offers a study of hospital readmissions in the medical emergency setting, outlining multifaceted factors and trends that impact readmission rates. The results emphasize the necessity for focused interventions, customized care strategies, and all-encompassing approaches to successfully reduce readmission risks..

To curtail readmissions, healthcare institutions must prioritize enhancing transitional care, fostering interdisciplinary collaboration, implementing evidence-based interventions, and investing in patient-centred care models²⁶. Moreover,

continuous monitoring, rigorous evaluation of readmission metrics, and iterative refinement of care protocols are essential to optimize patient outcomes, enhance care quality, and alleviate the burgeoning economic burden associated with avoidable readmissions²⁷. Ultimately, by addressing the identified gaps and leveraging the insights garnered, healthcare systems can forge pathways toward fostering resilience, improving patient experiences, and advancing equitable, high-quality care delivery across diverse patient populations²⁸.

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