



A STUDY OF FACTORS AFFECTING HOSPITAL READMISSIONS IN A TERTIARY CARE HOSPITAL OF PUNE

Hospital Administration

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ABSTRACT

Introduction: A hospital readmission is an episode when a patient is discharged from a hospital is readmitted within a specified time interval. It imposes financial burden on healthcare system as well as on patients. Patients who are discharged without following proper discharge protocol have higher incidence of readmissions. Various factors have emerged out from the study which influence readmission are categorized as medical factors such as discharge abstracts and claims forms, age, sex, diagnosis, procedures performed etc and nonmedical factors such as marital status, living arrangements, access to care, insurance coverage etc. Readmission rates are used as indicator of quality in health systems. **Objective:** To assess the factors associated with readmissions. **Methods:** Ccross-sectional study. The questionnaire used is "Kaiser Permanente all-cause readmission diagnostic tool". The study was conducted in 600 bedded, tertiary care super speciality hospital located in western Maharashtra. Study was conducted over a period of twenty four months. The sample size works out to be 158 assuming that 50% of patients having a particular factor for readmission and the patients included in the study were the patients with cardiovascular and respiratory diseases who are readmitted after previous discharge with the same diagnosis. **Results:** Out of 158 adults, 72.2% readmission cases were reported in males compared to 27.8% females. 30.4% readmissions were reported in age group 46-60 years. Study shows that 71.5% of patients readmitted belong to medical category, 17.7% were interventional, and 10.8% were surgical. 19% of patients had hypertension associated, 12.7% of the patients had both hypertension and diabetes mellitus. 98.1% of readmissions were related to index hospitalization and 34.8% readmissions were result of complication from index hospitalization. **Conclusion:** It is important to identify patients at higher risk of readmission. In this study, both modifiable and non-modifiable risk factors were identified. It is also concluded that co-morbid conditions are more likely associated with the risk of readmission.

KEYWORDS

Hospital readmission, comorbid conditions, index hospitalization, healthcare provider, non-modifiable and modifiable risk factors, discharge diagnosis

INTRODUCTION

In today's era of advanced medical facilities, the most vulnerable period for patient is transition from hospital to home. Patients who are discharged without following proper discharge protocol have higher incidence of readmissions.

It has been seen that significant number of hospital readmissions do occur often resulting in excessive wastage of healthcare resources. Hence, hospital readmission reduction is one of the greatest challenges in today's advanced health care system. Readmissions also affect quality of patients' life as well as imposes financial burden on healthcare system as well as on patients.

A hospital readmission is an episode when a patient who had been discharged from a hospital is readmitted within a specified time interval. In case of elderly patients, readmissions are mostly unplanned which increase burden on health care systems.

Various factors which influence readmission are categorized as medical factors, and nonmedical factors^[1] Medical factors for which information is readily available from secondary data sources (e.g., discharge abstracts and claims forms), such as age, sex, diagnosis, and procedures performed. Non-medical factors which are indicator of readmission are marital status, living arrangements, access to care, and insurance coverage. Other factors attributed to readmission are patient factors such as lower health literacy, lower socio-economic status, lack of social support, absent or delayed follow up, patient activity level and functional status, inability to obtain medication and other hospital services, hospital related factors such as Premature discharge, inadequate discharge instructions, therapeutic error, adverse drug events and other medication related issues, hospital acquired infections, disease-related, management plan understanding, compliance and adequate follow up and disease related factors e.g Index admission characteristics, co-morbidities, polypharmacy, use of high risk medications. Some more common causes include inappropriate or incomplete treatment, failure of adequate handover from secondary back to primary care, as well as poor social planning, particularly in the elderly^[2] Readmission rates are used as indicator of quality in health systems. Patient readmission in a short time after

discharge from hospital is an indicator for measuring quality of care^[1] In October 2012, the Centers for Medicare and Medicaid Services (CMS) enacted financial penalties on hospitals with higher than average risk-adjusted readmissions^[3] It was suggested that inpatient and outpatient providers and local support organizations must coordinate in order to decrease the burden of readmission. CMS also introduced new reimbursement methods for primary care providers (PCPs) to perform care continuum after discharge.^[4]

AIM

To study the factors affecting readmissions in a tertiary care hospital of Pune.

OBJECTIVE

The Objective of the study is to assess the factors associated with readmissions.

STUDY DESIGN & METHODOLOGY

This was a cross-sectional study. All the readmitted patients / attendants with cardiovascular and respiratory diseases and their primary health care providers were interviewed by means of structured (close ended) questionnaire. The questionnaire used in the study is "Kaiser Permanente all-cause readmission diagnostic tool". The Care Management Institute (CMI) of Kaiser Permanente (KP) developed this Kaiser Permanente All-Cause Readmission Diagnostic Tool for use by operational teams to gain insight into why readmissions occur and how they can further leverage their integrated delivery system to prevent unnecessary readmissions.

Place

The study was conducted in 600 bedded, tertiary care super speciality hospital affiliated to a teaching medical college located in one of the metropolitan cities of western Maharashtra. The hospital runs academic training of undergraduates (MBBS), post graduates (MD/MS) and post doctoral training students.

Presently it caters to a clientele of specialties including cardio-thoracic vascular surgery, interventional cardiology, Tuberculosis centre, Malignant Disease Tertiary Centre (MDTC), Respiratory Medicine.

Time Period

The study was carried over a period of twenty four months.

Sample Size

Sample size is calculated to estimate 95% confidence interval for proportion of patients having a particular factor associated with readmission among cardiology and respiratory patients with 5% absolute error of margin and finite correction (N=250 patients expected to be readmitted in a year). The sample size works out to be 158 assuming that 50% of patients having a particular factor for readmission.

Inclusion Criteria

Patients with cardiovascular and respiratory diseases who are readmitted after previous discharge with the same diagnosis.

Exclusion Criteria

Cardiovascular cases who get converted to surgical cases.

Data Collection & Tools Of Measurement

Formal interview of patients / attendants and their primary health care providers by means of structured (close ended) questionnaire. Medical records and case sheets were also reviewed to identify any missed opportunities in patient care and to assess the likelihood that the readmission could have been prevented.

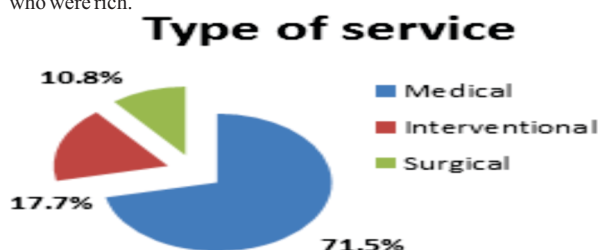
RESULTS

Data was collected by using the “**Kaiser Permanente all-cause readmission diagnostic tool**”, by interviewing 158 patients/ attendants and their healthcare providers and also by reviewing their medical record documents. Data was entered and analysed using SPSS software and reflected as below:

Table 1. Distribution Of Study Population Based On Socio-demographic Profile

S. no.	Characteristics	Number (Percentage)
1	Sex	
	Male	114 (72.2)
	Female	44 (27.8)
2	Age distribution	
	0-15	9 (5.7)
	16-30	15 (9.5)
	31-45	31 (19.6)
	46-60	48 (30.4)
	61-75	44 (27.8)
	above 75	11 (7.0)
3	Caste	
	Hindu	132 (83.5)
	Muslim	14 (8.9)
	Sikh	10 (6.3)
	Christian	2 (1.3)
4	Socioeconomic Status	
	Rich	12 (7.6)
	Middleclass	126 (79.7)
	Poor	20 (12.7)

The studied population consisted of 158 adults, with a mean age 50.1 and median age 55. Readmission cases were reported more in males 72.2% compare to females, 27.8%. A large number of readmission cases, 30.4% were reported in age group 46-60 years, followed by 27.8% of the cases in age group 61-75 years. Out of total 158 patients who were readmitted, more than 80% were Hindus and 8.9% were Muslims. Majority of the patients readmitted were from middle class, 79.7%, followed by 12.7% patients who were poor, and 7.6% patients who were rich.



Graph 1. Distribution Of Study Population Based On Type Of Service

Table 2 presents the chronic conditions from which the patients suffer. 19% of patients had hypertension associated, 12.7% of the patients had both hypertension and diabetes mellitus, 10.1% had CKD and a small number had heart failure (3.8%) and cardiovascular disease (3.8%).

It was observed that the principal diagnosis for which 18.3% of the patients were admitted to hospital was heart failure, followed by coronary artery disease in 15.8% of the patients. A small number of patients reported with pneumonia, bronchial asthma, 5.7% and less than 5% of patients presented with MI, CABG.

It was observed that their functional status shows that 16.5% patients were fully dependent, 53.2% patients were somewhat dependent and 30.4% patients were not dependent during index hospitalization discharge.

In case of readmissions, almost one-fourth of the patients suffered from heart failure, 8.9% from SSI and coronary artery disease, 7% from COPD. This is similar to index hospitalization where prevalence of heart failure and coronary artery disease is maximum.

Out of total 158 patients, it was observed that in 98.1% of the patients readmission diagnosis was related to index hospitalization and in 34.8% of patients, readmission was a result of complication from index hospitalization.

On face to face interview with patients or their caregivers, 68.4% responded that readmission was scheduled ahead of time. According to patients, almost 84.8% of them were informed and explained about discharge instructions by hospital staff, whereas, 14.2% patients were not explained about these instructions.

On taking interview of healthcare providers, it was found that 71.5% of patients were readmitted after and 28.5% were admitted before their scheduled follow up date. It was also found in the study that healthcare providers would have already predicted these readmissions in 22.8% of cases. Out of 158 patients, Healthcare providers discussed with 147 (93%) patients/caregivers regarding their health and course of treatment.

Table 2 Category (within Days) Wise Readmissions

Category	Frequency	Percentage (%)
< 30 days	23	14.55
31-90 days	75	47.46
91-180 days	39	24.68
> 180 days	21	13.29
Total	158	100

Table 2 shows different categories of readmissions, it was seen in the study that 14.55% patients were readmitted within 30 days of discharge, majority of the patients were readmitted within 90 days of discharge.

It was found in the study that maximum Length of stay (LOS) was 70 days and the duration between index discharge and readmission was 7 days. The minimum length of stay was found to be 2 days and the duration between its index discharge and readmission was 98 days. Factors which came out of the study are classified into Non-modifiable risk factors and Modifiable risk factors. Non-modifiable risk factors are mainly socio-demographic factors which influence readmission risk and cannot be modified by any means. However modifiable risk factors are risk factors that can be potentially controlled or treated by interventions.

Table 3 Results Of The Factors Studied Into Non-modifiable And Modifiable Risk Factors

Non-modifiable risk factors (Socio-demographic determinants)	Modifiable risk factors
Higher Age	Prior admission
46-60 yrs (30.4%)	Heart failure (18.3%)
Male gender (72.2%)	Longer Length of stay
Poor living conditions	Poor discharge planning
Middle class (79.7%)	
Poor overall condition	Inadequate discharge instructions
	• Contact info if problem arises (Not included)

	• Unable to understand discharge instructions • Info about diet (Not included – 30%)
Functional disability	Clinical instability at the time of discharge Somewhat dependent – (84%)
Lack of social support	Type of intervention Medical intervention (71.5%)
	Chronic condition Hypertension (30%)
	Readmission Diagnosis • Heart Failure (24%) • Related to index admission (98%) • Result of complication from index admission (34.8%)
	Doctor's Perspective • Heavy workload leads to limited contact between doctor and caregiver. • Lack of social support. • Non compliance with discharge instructions • Non compliance with medication prescribed • Lack of transportation for follow-up • Lack of family support • Various personal and social issues
	Patient's perspective • Lack of discharge preparedness • Non-adherence with discharge medications because of anxiety about side effects, non-availability of medicines, expensive medications.

DISCUSSION :

There are several key findings from this study. Readmissions in the acute care in this cohort were due to wide range of diagnosis. These diagnoses were related to the same index admission diagnosis in over more than 90% of cases.

Socio-demographic Factors -

In this review, socio-demographic factors were reported by most studies. In our study, the prevalence of readmissions was found to be higher in old age patients. This is similar to findings in other studies where older age has been reported to associate with higher readmission rates^[5]. The possible reason is that older patients suffer from more health issues than younger patients, such as comorbidities and polypharmacy^[5]. Gender-related social behaviors may play a role in the different readmission patterns^[6]. Evidence showed that poor physical and psychological health outcomes, including hospital readmissions, were associated with socioeconomic status disadvantage (e.g., low income, limited education, substandard neighborhoods)^[7-9]. Lower socioeconomic status was reported to indirectly affect health by causing more stress, exposure to worse physical or social environments, unhealthy lifestyles, or limited access to healthcare resources^[10].

Index Hospitalization -

It has been shown in our study that the length of stay of index admissions can also influence readmissions^[11]. A longer stay may indicate a more complicated underlying situation and may expose the patient to more risks^[12].

Co-morbidities, Conditions, Lab Tests, And Medications -

It is very evident in this study that co morbidities play a very important role in readmission. Most common comorbid conditions associated with principle diagnosis in this study are Hypertension, Diabetes mellitus, Renal disease and cardiovascular diseases. This is similar to findings of previous studies where there was more prevalence of chronic diseases such as heart failure, diabetes, renal impairment, and chronic lung disease associated with higher readmission rates^[13,14].

Diagnosis During Readmission -

In our study, almost one-fourth of the patients suffered from heart failure, 9.3% from SSI, 8% from coronary artery disease, and 6.7% from COPD.

In one of the studies, the principle diagnoses of 30 day readmissions were neoplasm (16.8%) infection (10.9%) heart failure (4.9%) liver disorders (4.4%) and gastrointestinal disorders (3.6%). However,

when only avoidable readmissions were assessed in these studies, the diagnoses which emerged were infection (11.6%) neoplasm (8.4%) and heart failure (7.1%)^[15].

Discharge Process -

Poor discharge instructions have several negative consequences for patients and care facilities. In our study, 81% patients were given discharge instructions to their caregiver and 19% were not. One of the most important discharge summary components is the patient/family discharge instructions. Alper et al. (2017) suggested that this component should be brief and contain valuable, critical information that patients/families/caregivers can use to manage symptoms after leaving the hospital^[16]. Many physicians also believed that better communication between patient and staff could decrease hospital readmissions.

Functional Status At The Time Of Discharge -

It was found in our study that 16.5% patients were fully dependent, 53.2% were somewhat dependent and 30.4% were independent at the time of index hospitalization discharge. In previous studies, high proportion of readmission was observed in patients with low functional status during discharge. The highest rate of readmission, 28.7%, was found in low functioning medical patients in a study^[17].

Doctor's / Physician's Perspective -

A heavy workload was also a reason for the limited contact between the hospital and the patient or caregiver by telephone during office hours. Some of the physicians were contented with the amount of personal touch they had with the patients, whereas, others wanted more amount of contact and communication when treating complicated patients or those needing medication changes.

Patient's Perspective -

During the transition from hospital to home, almost 50% readmitted patients reported experiencing challenges which contributed to readmission. The most commonly reported issues contributing to readmission were lack of discharge preparedness and non-adherence with discharge medications.

CONCLUSION:

In this study, several factors have emerged which are significantly associated with readmission within few days / months of discharge. These associations covered individual as well as system-level factors. Individual factors involved a mix of socio-demographic factors, illness, health and system factors are related to healthcare utilization prior to index admission, and clinical and organizational determinants related to the index admission. In this study, both non-modifiable and modifiable risk factors were identified. It is also concluded that certain diagnoses or co-morbid conditions are more likely to be associated with the risk of readmission. Medication non-compliance and failure to follow dietary instructions and inability to comply with discharge instructions are also other readmission related factors. It is important for hospitals to identify patients at higher risk of readmission. Certain methods which can be used to identify patients at high risk of readmission are predictive models or advanced age, polypharmacy, decreased functional status etc. The main conclusion of this study shed light on the importance of communication feedback loop with post-acute care facilities, discharge planning and instructions, community based care transition programs, use of EHRs, and patient socio-demographic factors.

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