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Original Research Article

Identifying Predictors of Emergency Readmission Within 7 Days of Hospital Discharge: A Prospective Cohort Study

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Abstract: *Early return visits to the emergency department after discharge reflect gaps in transitional care and are associated with increased morbidity, healthcare burden, and costs.* ***Objective:*** *To determine the frequency of emergency department revisits within seven days of discharge and to identify associated clinical and demographic risk factors.* ***Methods:*** *A descriptive study was conducted at the Department of Medicine, Shifa International Hospital, Islamabad, from 5 November 2024 to 5 March 2025. A total of 275 patients discharged from the emergency department were enrolled using consecutive sampling. Patients aged 16 to 85 years, both sexes, were included. Data on demographic characteristics, comorbidities, length of hospital stay, and discharge clinical parameters were collected. Early readmission was defined as a return to the emergency department within seven days of discharge. Evaluated factors included advanced age, prolonged hospitalization, chronic illnesses, fever, tachycardia, anemia, hyponatremia, cognitive impairment, and malnutrition. Data were analyzed using SPSS version 26, with statistical significance set at p≤0.05.* ***Results:*** *Early readmission occurred in 26.2% of patients. Among readmitted individuals, 56.9% were aged 60 or older. Significant associations were observed with hypertension (p=0.001) and cognitive impairment (p<0.001). Nutritional deficits and anemia were highly prevalent among readmitted patients, affecting 69.4% and 65.3%, respectively. No statistically significant association was found between early readmission and gender, place of residence, or socioeconomic status.* ***Conclusion:*** *Older age, chronic medical conditions, cognitive impairment, malnutrition, and anemia are key predictors of early emergency department readmission. Targeted discharge planning, nutritional assessment, and structured post-discharge follow-up may reduce preventable emergency returns and improve patient outcomes.*

Keywords: Aged, Emergency Service Hospital, Hospital Readmission, Malnutrition, Risk Factors

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Introduction

A hospital readmission occurs when a patient is readmitted to the hospital within a specified period after discharge. Different time periods are typically used for this definition. (1) Hospital readmissions among elderly individuals are frequent and often seen as an unfavorable result following discharge. These readmissions are linked to a variety of factors, including advancing age, living circumstances, disease progression, and aspects related to the care process. To help healthcare providers focus more on patients at higher risk of readmission, it is crucial to identify the specific characteristics of these individuals. (2, 3)

Risk stratification tools can identify patients at risk of emergency readmission, but available tools lack strong predictive power. (4) Patients in poor health who take 10 or more medications regularly and live in the community with home care are more likely to be readmitted to the hospital shortly after discharge. (5) Readmissions after acute coronary syndrome are not evenly spread throughout the 30 days following discharge. There is a lack of comprehensive data on the factors predicting all-cause readmission during the early (0-7 days) and late (8-30 days) post-discharge periods for this patient group. (6, 7)

Emergency is always busy and a 24/7 job. It has been observed that many cases involve readmission within a few days of hospital discharge. The literature shows that the frequency of emergency readmission may vary across studies; therefore, no consistent data are available on predictors of readmission. (8) Also, there is no local study done before, which could help us determine the extent of emergency readmission and the predictors that lead to readmission. Therefore, there is a need to conduct a study to get evidence for the local setting and practice. This will help us improve our knowledge and practice. In the future, we will implement regular screening of patients before discharge, after controlling for controllable factors, to prevent complications and readmissions.

Methodology

After obtaining Institutional Review Board approval, this descriptive study was conducted at the Department of Medicine, Shifa International Hospital, Islamabad, from 5 November 2024 to 5 March 2025. Sample size was calculated using the WHO calculator; a sample size of 275 cases was determined with 95% confidence, a 5% margin of error, and a readmission rate of 22.9% in emergency (9). Sample selection was conducted using non-probability, consecutive sampling. We included patients aged 16-85 years, both genders, who presented to the emergency department and were discharged from the hospital after treatment. Patients with missing records or who were admitted to another hospital before were not included in the study. Two hundred and seventy-five patients who fulfilled the selection criteria were enrolled from the emergency department. Informed consent was taken from the attendants. Demographics (name, age, gender, initial Diagnosis on first admission, duration from previous discharge, and current presentation, occupation, socioeconomic status, residence, h/o diabetes (BSR>200 mg/dl), hypertension (P≥140/90 mmHg), cognitive impairment) were noted. If the patient reported being readmitted within 7 days of initial hospital discharge, the emergency readmission was labeled. Then, patients were assessed for predictors of readmission, including age >60, length of hospital stay >5 days, presence of chronic medical condition, fever, Tachycardia on arrival, anemia, hyponatremia at discharge, and

malnutrition. All this information will be recorded in a proforma (attached).

Data analysis: Data were entered and analyzed in SPSS v. 26. Quantitative variables, such as age and duration from the previous discharge to the current presentation, were reported as means and standard deviations. Qualitative variables like gender, initial Diagnosis on first admission, occupation, socioeconomic status, residence, h/o diabetes, hypertension, cognitive impairment, emergency readmission and predictors (age >60, length of hospital stay>5 days, presence of chronic medical condition, fever, Tachycardia on arrival, anemia, hyponatremia at discharge, malnutrition) were presented as frequency and percentage. Data were stratified for age, gender, initial Diagnosis, duration from previous discharge and current presentation, occupation, socioeconomic status, residence, h/o diabetes, hypertension, and cognitive impairment. Post-stratification, the chi-square test was applied to compare the frequency of emergency readmission and predictors within stratified groups. P-values ≤
0.05 will be considered significant.

Results

The study comprised 275 patients with a mean age of 52.73±21.43 years. The average interval between discharge and potential readmission was approximately 15±9.10 days, highlighting a critical post-discharge period that may require closer follow-up. The gender distribution showed a slight male predominance, with males accounting for 56.4% of the sample. Occupational diversity was evident, with clerks (19.3%) and housewives (18.9%) forming the largest groups, followed by teachers (17.1%), laborers (14.2%), farmers (9.5%), and engineers (10.5%). Notably, 10.5% of participants were unemployed. The most prevalent diagnoses were COPD (19.3%), urinary tract infections (17.8%), stroke (17.1%), and heart failure (16.4%), indicating a dominance of chronic and infectious conditions. The socioeconomic background of the participants was relatively evenly distributed, with 37.5% identifying as middle class, 32.4% as high, and 30.2% as low socioeconomic status. In terms of residence, a majority lived in urban areas (51.6%), followed by rural (30.5%) and semi-urban (17.8%) localities. Among comorbid conditions, diabetes was the most frequently reported (42%), followed by hypertension (34.9%) and cognitive impairment (9.8%). (Table 1) Figure 1 shows that 26.2% (n=72) of patients experienced emergency readmission within 7 days of discharge. This early readmission window suggests underlying vulnerabilities, either clinical or social, that require targeted interventions. Figure 2 identifies specific clinical and demographic factors associated with an increased risk of early readmission. Among these, advancing age, presence of hypertension, and cognitive impairment emerged as critical predictors, aligning with existing literature that emphasizes the compounded impact of chronic diseases and functional decline on post-discharge outcomes. The statistical analysis revealed a significant association between age and readmission (p-value=0.004), with patients aged 60 and older accounting for the majority of readmissions (56.9%). This finding underlines the increased vulnerability of elderly individuals to post-discharge complications, likely due to frailty and multiple comorbidities. Gender was not significantly associated with readmission (p-value=0.475), indicating a relatively balanced risk across sexes. Diagnostic categories showed no statistically significant differences in readmission rates; however, stroke and UTI patients demonstrated comparatively higher proportions among those readmitted, suggesting a potential trend that warrants further investigation. Occupational status did not yield a significant association (p-value=0.234), though employed individuals formed the largest subgroup among readmitted cases. Socioeconomic status also approached but did not reach statistical significance (p-value = 0.078), with higher readmission rates observed among patients from high-income backgrounds, possibly due to greater healthcare access or surveillance bias. Residential setting was not significantly associated with readmission (p-value=0.106), although urban residents constituted a larger share of readmissions. This may reflect urban healthcare-seeking behavior or environmental stressors impacting recovery. Comorbid hypertension demonstrated a strong association with readmission (p-value=0.001), suggesting that cardiovascular instability post-discharge may precipitate recurrent emergency visits. Moreover, cognitive impairment showed the strongest association with readmission (p-value < 0.001), reinforcing the importance of cognitive assessment and support during discharge planning. (Table-7)

Table 1: Patients' characteristics

	n=275
Age (Years)	52.73±21.43
Duration between two admissions	15.19±9.10
Gender	
Male	155(56.4%)
Female	120(43.6%)
Occupation	
Clerk	53(19.3%)
Engineer	29(10.5%)
Farmer	26(9.5%)
Laborer	39(14.2%)
Teacher	47(17.1%)
Unemployed	29(10.5%)
House wives	52(18.9%)
Diagnosis	
COPD	53(19.3%)
Heart Failure	45(16.4%)
Pneumonia	39(14.2%)
Sepsis	42(15.3%)
Stroke	47(17.1%)
UTI	49(17.8%)
Socioeconomic status	
High	89(32.4%)
Low	83(30.2%)
Middle	103(37.5%)

Residence	
Rural	84(30.5%)
Urban	142(51.6%)
Semi Urban	49(17.8%)
Comorbidity	
Diabetes	118(42.0%)
Hypertension	96(34.9%)
Cognitive impairment	27(9.8%)

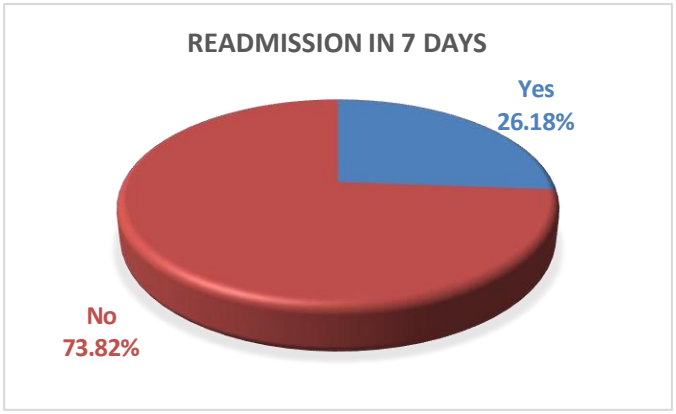

Figure 1: Rate of emergency readmission within 7 days of hospital discharge

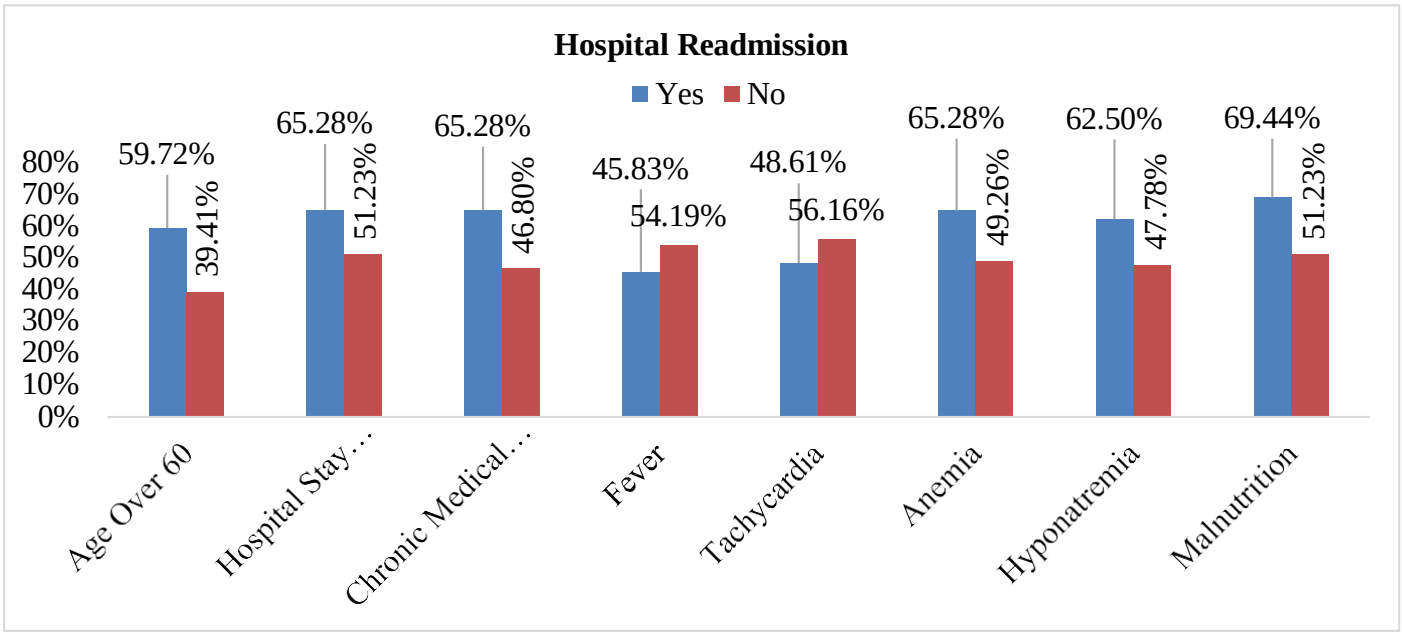

Figure 2: Predictors of emergency readmission within 7 days of hospital discharge.

Table 2: Association of hospital readmission with patients' characteristics

Variables	Categories	Readmission		p-value
		Yes 72	No 203	
Age	18-40	17(23.6%)	74(36.5%)	0.004*
	41-60	14(19.4%)	59(29.1%)	
	>60	41(56.9%)	70(34.5%)	
Gender	Male	38(52.8%)	117(57.6%)	0.475
	Female	34(47.2%)	86(42.4%)	
Diagnosis	COPD	12(16.7%)	41(20.2%)	0.362
	Heart Failure	11(15.3%)	34(16.7%)	
	Pneumonia	6(8.3%)	33(16.3%)	
	Sepsis	12(16.7%)	30(14.8%)	
	Stroke	17(23.6%)	30(14.8%)	
	UTI	14(19.4%)	35(17.2%)	

Occupation	Employed	52(72.2%)	142(70%)	0.234
	House wives	16(22.2%)	36(17.7%)	
	Unemployed	4(5.6%)	25(12.3%)	
Socioeconomic Status	Low	18(25%)	65(32%)	0.078
	Middle	23(31.9%)	80(39.4%)	
	High	31(43.1%)	58(28.6%)	
Residence	Rural	23(31.9%)	61(30%)	0.106
	Semi Urban	7(9.7%)	42(20.7%)	
	Urban	42(58.3%)	100(49.3%)	
Diabetes		35(48.6%)	83(40.9%)	0.255
Hypertension		37(51.4%)	59(29.1%)	0.001*
Cognitive Impairment		21(29.2%)	6(3%)	<0.001*

Discussion

In this study, the readmission rate within 7 days of hospital discharge to the emergency department was 26.18%. Studies have reported readmission rates within 7 days of hospital discharge ranging from 2.3% to 32.7%. (10-12) In one study, the readmission rate within <7 days was 48.1%, which was higher than that observed in this study (13). The variation in 7-day readmission rates across studies can be attributed to differences in patient populations, hospital protocols, and readmission definitions. Several studies have highlighted factors contributing to early readmissions, particularly those occurring within 7 days of hospital discharge. In this study, the most frequent factor among readmission patients was malnutrition (69.44%), followed by anemia (65.28%), chronic medical condition (65.28%), and hospital stay >5 days (65.28%), hyponatremia (62.50%), and age over 60 years (59.72%). In his study, Jay Pershad identified factors predicting 7-day revisits and readmissions, including age, hospital stay duration, and the presence of chronic medical conditions. (10) These results are in line with the findings of this study, as all these factors were frequently common among patients with readmission.

Age has consistently been identified as a significant predictor of emergency readmission. This finding aligns with other studies showing that older adults are at higher risk of readmission. Local and international studies have reported higher readmission rates among patients aged 60 and older. (12, 14, 15) Studies have focused on specific age groups; however, in this study, we included younger and elderly patients, and we found that 56.9% of elderly patients had a readmission within 7 days. Elderly patients face heightened vulnerability due to various factors, including the natural decline in organ function associated with aging, the use of multiple medications, and the challenges of managing several chronic health conditions simultaneously.

Extended hospital stays, especially those lasting more than 5 days, are commonly associated with a higher likelihood of readmission within 7 days. (16) In this study, among readmitted patients, 65.28% patients had a hospital stay of>5 days.

Chronic medical conditions are another predictor of hospital readmission among patients. Samar Fatima, in her study, reported that among hypertensive (73.3%) and diabetic (56%) patients, the frequency of readmission was significantly higher. (14) These results support our findings, as in this study, 48.6% diabetic and 51.4% hypertensive patients had readmission. Chronic medical conditions are strong predictors of readmission within 7 days of hospital discharge, particularly among patients with multiple comorbidities. (15) In this study, 65.28% patients with chronic medical conditions had readmission. This finding is supported by other studies as well. (10)

Anemia and malnutrition are significant predictors of readmission rates within seven days of hospital discharge, particularly in vulnerable populations such as older adults and children. Research indicates that malnutrition at the time of admission correlates with higher rates of unplanned readmissions and mortality shortly after discharge. This relationship underscores the importance of nutritional assessment in clinical settings. (13, 17) In this study, 65.28% of patients were anemic, and 69.44% were malnourished, and 69.44% were readmitted within 7 days, indicating that these two factors are leading predictors of readmission. Patients with malnutrition were at an increased risk for both early and late readmissions. (11) Malnutrition in elderly patients upon hospital admission is a key factor in predicting both readmission and mortality, occurring in the immediate and later stages after discharge. (17) Nutritional risk was a significant factor in predicting readmission for older patients, indicating that evaluating and improving nutritional status during hospitalization may help lower early readmission rates. (18)

A readmission within 7 days of discharge is often considered a marker of inpatient care, yet the specific factors contributing to rapid readmissions remain unclear. These early readmissions may be more strongly associated with modifiable risk factors during the initial hospital stay. By identifying these risk factors, targeted interventions could be implemented to reduce the likelihood of readmission. (19) Identifying this high-risk group of patients early could offer opportunities for intervention and improved care coordination during discharge. Preventing readmission and mortality post-hospitalization is complex, but focusing on high-risk patients can help reduce readmissions. Discharge plans should address both acute conditions and underlying comorbidities. Including palliative care, home healthcare, and rehabilitation, along with a follow-up within 4-5 days, is crucial. Implementing these steps before discharge, as per hospital policy, can reduce risks.

This study has several limitations. The sample size of 275 patients may not fully reflect the broader population, and larger studies across multiple centers would help improve the generalizability of the results. As a cross-sectional study, it only offers a snapshot of the data, preventing causal relationships from being drawn. Additionally, reliance on self-reported information could introduce bias or inaccuracies. Excluding patients with incomplete records or those treated at other hospitals may have led to selection bias. Furthermore, the study's focus on a single hospital may limit the generalizability of its findings to other healthcare settings.

Conclusion

Early readmissions were common, affecting more than one-quarter of discharged patients, with older adults accounting for the most significant proportion. Hypertension and cognitive impairment were also prominent among readmitted cases, highlighting key risk factors. Strengthening discharge planning and follow-up for high-risk patients, especially older individuals and those with chronic or cognitive conditions, may help reduce preventable early readmissions and improve overall care outcomes.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate were obtained from the relevant department. (IRBEC-24)

Consent for publication

Approved

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Conflict of interest

The authors declared no conflict of interest.

Author Contribution

ETR (Resident)
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Review of Literature, Data entry, Data analysis, and drafting articles.
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Study Design, manuscript review, and critical input.
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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Dhaliwal JS, Dang AK. Reducing hospital readmissions. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan. Available from: StatPearls Publishing.
2. Pedersen MK, Meyer G, Uhrenfeldt L. Risk factors for acute care hospital readmission in older persons in Western countries: a systematic review. JBI Database Syst Rev Implement Rep. 2017;15(2):454-485. https://doi.org/10.11124/JBISRIR-2016-003267
3. Glans M, Kragh Ekstam A, Jakobsson U, Bondesson Å, Midlöv P. Risk factors for hospital readmission in older adults within 30 days of discharge: a comparative retrospective study. BMC Geriatr. 2020;20(1):467. https://doi.org/10.1186/s12877-020-01874-5
4. Sieck C, Adams W, Burkhart L. Validation of the BOOST risk stratification tool as a predictor of unplanned 30-day readmission in elderly patients. Qual Manag Health Care. 2019;28(2):96-102. https://doi.org/10.1097/QMH.0000000000000206
5. King L, Harrington A, Nicholls S, Thornton K, Tanner E. Towards reduction of preventable hospital readmission: older people and family members' views on planned self-management of care at home. J Clin Nurs. 2023;32(15-16):4599-4613. https://doi.org/10.1111/jocn.16492
6. Cholack G, Garfein J, Krallman R, Feldeisen D, Montgomery D, Kline-Rogers E, et al. Predictors of early (0 to 7 days) and late (8 to 30 days) readmission in a cohort of acute coronary syndrome patients. Int J Med Stud. 2022;10(1):38-48. https://doi.org/10.5195/ijms.2022.1058
7. Cholack G, Garfein J, Errickson J, Krallman R, Montgomery D, Kline-Rogers E, et al. Early (0 to 7 days) and late (8 to 30 days) readmission predictors in acute coronary syndrome, atrial fibrillation, and congestive heart failure patients. Hosp Pract (1995). 2021;49(5):364-370. https://doi.org/10.1080/21548331.2021.1976558
8. Koch JJ, Beeler PE, Marak MC, Hug B, Havranek MM. An overview of reviews and synthesis across 440 studies examines the importance of hospital readmission predictors across various patient populations. J Clin Epidemiol. 2024;167:111245. https://doi.org/10.1016/j.jclinepi.2023.111245
9. Menditto VG, Fulgenzi F, Bonifazi M, Gnudi U, Gennarini S, Mei F, et al. Predictors of readmission requiring hospitalization after discharge from emergency departments in patients with COVID-19. Am J Emerg Med. 2021;46:146-149. https://doi.org/10.1016/j.ajem.2021.04.055
10. Pershad J, Jones T, Harrell C, Ajayi S, Giles K, Cross C, et al. Factors associated with return visits at 7 days after hospital discharge. Hosp Pediatr. 2020;10(4):353-358. https://doi.org/10.1542/hpeds.2019-0207
11. Sharma Y, Miller M, Kaambwa B, Shahi R, Hakendorf P, Horwood C, et al. Factors influencing early and late readmissions in Australian hospitalised patients and investigating the role of admission nutrition status as a predictor of hospital readmissions: a cohort study. BMJ Open. 2018;8(6):e022246. https://doi.org/10.1136/bmjopen-2018-022246
12. Armitage MN, Srivastava V, Allison BK, Williams MV, Brandt-Sarif M, Lee G. A prospective cohort study of two predictor models for 30-day emergency readmission in older patients. Int J Clin Pract. 2021;75(9):e14478. https://doi.org/10.1111/ijcp.14478
13. Adania ET, Faria Junior GS, Franzoni NR, Pimentel SK. Emergency room readmission: an avoidable problem? Analysis and stratification of readmissions in a trauma reference center. Rev Col Bras Cir. 2024;51:e20243704. https://doi.org/10.1590/0100-6991e-20243704-en
14. Fatima S, Shamim S, Raffat S, Tariq M. Hospital readmissions in internal medicine specialty: frequency, associated factors and outcomes. Pak J Med Sci. 2021;37(7):2008-2013. https://doi.org/10.12669/pjms.37.7.3575
15. Dafrallah S, Akhloufi MA. Factors associated with unplanned hospital readmission after discharge: a descriptive and predictive study using electronic health record data. BioMedInformatics. 2024;4(1):219-235. https://doi.org/10.3390/biomedinformatics4010014
16. Maali Y, Perez-Concha O, Coiera E, Roffe D, Day RO, Gallego B. Predicting 7-day, 30-day, and 60-day all-cause unplanned readmission: a case study of a Sydney hospital. BMC Med Inform Decis Mak. 2018;18:1. https://doi.org/10.1186/s12911-017-0580-8
17. Sharma Y, Miller M, Kaambwa B, Shahi R, Hakendorf P, Horwood C, et al. Malnutrition and its association with readmission and death within 7 days and 8-180 days postdischarge in older patients: a prospective observational study. BMJ Open. 2017;7(11):e018443. https://doi.org/10.1136/bmjopen-2017-018443
18. Iversen MKF, Buhl A, Schnieber A. Nutritional risk predicts readmission within 30 and 180 days after discharge among older adult patients across a broad spectrum of diagnoses. Clin Nutr ESPEN. 2024;61:288-294. https://doi.org/10.1016/j.clnesp.2024.03.027
19. Finn A, Naqvi R, Selvaraj V, Dapaah-Afriyie K. Rapid (7-day) readmissions to an inpatient medical service at a tertiary, academic medical center. Brown Hosp Med. 2022;1(2):36124. https://doi.org/10.56305/001c.36124