ORIGINAL ARTICLE

Implementing Discharge By Noon (DBN) in a Pediatric Ward: A Quality Improvement Initiative in a Low-Middle Income Country

Rubab Naz[1*], Asma Noreen[1], Haider Abbas[1], Eman Jawed[1], Muhammad Irfan[2], Ihsan Ali[1], Anwarul Haque[1] and Atika Sher[1]

[1]Department of Pediatric and Child Health, Liaquat National Hospital and Medical College, Karachi, Pakistan
[2]Department of Statistics, Liaquat National Hospital and Medical College, Karachi, Pakistan

Abstract

Background: Delayed discharge (DD) from hospitals disrupts patient care, increases healthcare costs, and leads to bed shortages and many hospital-acquired complications. In pediatric settings, especially in low- and middle-income countries, this could further strain already bed-constrained hospitals.

Objective: This study evaluates the efficacy of implementing a structured "Discharge before Noon (DBN)" initiative, using Lean Six Sigma methodology, to improve discharge efficiency and timelines in a pediatric inpatient ward.

Methods: A quasi-experimental design was used. We initiated a quality-improvement project as a multidisciplinary team (consisting of attending physicians, residents, staff nurses, and coordinators) by using the Six Sigma Lean method. Pre-intervention (January 2020 to December 2020) and post-intervention (January 2021 to December 2021) data were analyzed for 300 patients admitted to the pediatric ward (150 per group). The primary outcome was the percentage of DBN, which is defined as "Discharge before 12:59 PM".

Results: The study included 300 pediatric patients with balanced pre- and post-intervention groups (n=150 each). DBN rates increased from 3.3% (pre-intervention) to 15.3% (post-intervention) ($p<0.001$), with median discharge time improving from 19:00 to 16:00 ($p<0.001$). Process efficiency significantly improved, reducing mean discharge time by 38% (from 8.4 hours to 5.2 hours) and discharge summary time by 57% (from 6.8 hours to 2.9 hours). Late discharges (>20:00) decreased by 89% ($p<0.001$). During the study period, fewer than 5% of planned discharges were postponed due to unforeseen medical or administrative reasons, with no significant difference between pre- and post-intervention groups.

Conclusion: Our research demonstrates that a tailored DBN initiative, leveraging multidisciplinary teamwork and Lean Six Sigma, can significantly enhance discharge efficiency in pediatric wards of LMICs. While the improvement is substantial, sustaining these gains will require ongoing reinforcement, technological support, and policy integration. This model offers a scalable framework for similar resource-constrained settings.

Keywords: *Discharge before noon, pediatric, quality improvement, hospital efficiency, multidisciplinary.*

INTRODUCTION

Delayed Discharge (DD) is defined as "when a medically fit patient remains in the hospital as an inpatient" [1]. DD is considered a system-level challenge demanding practical team efforts and coordination between health and social care [2, 3]. DD from hospitals is a major contributor to diminished quality of care worldwide. DD significantly contributes to reduced care quality through multiple mechanisms: increased risk of hospital-acquired infections [4, 5], cancellation of elective procedures, and significant financial burdens on healthcare systems [6]. Several papers have described the increased frustration among families and the high stress levels among staff on DD [7]. Length of Stay (LOS) remains a quality indicator for many hospitals because it is a crucial performance outcome measure. Timely discharges improve efficient patient flow, patient and staff satisfaction, alleviate bed shortage, and reduce length of stay and healthcare costs.

**Corresponding author: Rubab Naz, Department of Pediatric and Child Health, Liaquat National Hospital and Medical College, Karachi, Pakistan, Email: rubabnaz1@gmail.com*
Received: May 17, 2025; Revised: October 22, 2025; Accepted: November 26, 2025
DOI: https://doi.org/10.37184/jlnh.2959-1805.4.16

Hospital discharge of inpatients is a complex process that requires collaboration among multidisciplinary services for a safe and effective transition from hospital to home [4, 6]. Many regulatory authority agencies, such as the Institute of Medicine (IOM) and the Institute for Healthcare Improvement (IHI), have emphasized the importance of discharge planning, identifying reasons for delays, and eliminating barriers [6].

Hospital discharge is an important biometric for physicians, patients, and their families. Several papers have been published on the various components related to the discharge process in high-income countries for adults [8-10]. White *et al.* (2014) reported a significant improvement in hospital discharge rates for inpatient children from 42% to 80% over 18 months of implementing strategies for early discharge [9]. Wertheimer *et al.* (2014) also reported that 27% of patients were discharged before noon after implementation of an earlier discharge project [10]. However, the data from low and middle-income countries remained scarce [11-13]. This evidence gap is particularly concerning given the bed capacity constraints and staffing challenges characteristic of LMIC healthcare facilities such as those in Pakistan.

We have a limited number of beds in the Pediatric ward of LNHMC. Most discharges occurred after late evening. These delays have resulted in three measurable consequences: (1) decreased parent satisfaction, (2) increased staff frustration and burnout among resident physicians and nurses, and (3) more importantly, it causes "choking of new admissions" [14-16].

To address these challenges, we implemented a Multidisciplinary Quality Improvement Project, "Discharge by Noon (DBN)," in our Paediatric ward, applying Six Sigma principles to streamline discharge processes.

The objective was to assess the impact of this multidisciplinary quality improvement initiative on the discharge before noon (DBN) rate, a key indicator of discharge efficiency, alongside secondary process-time metrics.

MATERIALS AND METHODS

A quasi-experimental (pre- and post-intervention) Quality Improvement (QI) initiative was conducted in a 36-bed pediatric ward from January 2020 to December 2021 with institutional ethical approval (REF letter No. App # 0762 2022 LNH-ERC). Pre-intervention (baseline) data were collected from January 2020 to December 2020. All the doctors, staff nurses, and coordinators were trained in December 2020. The intervention was actively implemented and outcomes measured concurrently during January 2021 to December 2021. We screened and included all children (1 month - 15 years) admitted to the pediatric ward. We excluded patients discharged from NICU/PICU/surgical units, LAMA cases, transfers, deaths, and unplanned midnight discharges (00:00-08:00). The final analytical sample included 300 patients (150 pre-intervention, 150 post-intervention) meeting all eligibility criteria.

The sample size was calculated using the PASS 2021 sample size calculator for two independent proportions. Based on Wertheimer *et al.* (2014), a pre-intervention prevalence of discharge by noon of 11% [10] and an anticipated post-intervention prevalence of 38% [10], with a 90% power and a two-sided significance level (α = 0.05), the estimated sample size was 62 participants per group. To account for potential attrition, a 20% dropout rate was included, yielding a final sample size of 156 participants (78 per group). To further improve the robustness of our findings and follow the subgroup analyses, we ultimately enrolled 150 patients in each group, making the final and total sample size of 300, a common practice in QI studies where practical enrollment often exceeds the minimal statistical requirement. 300 patients (150 pre-intervention, 150 post-intervention) were enrolled *via* consecutive sampling during the study periods (pre-intervention: January 2020 to December 2020; post-intervention: January 2021 to December 2021).

The data were collected retrospectively through medical records and ward logs, capturing discharge times and demographics. Face-to-face surveys were not conducted; all data were extracted from institutional documentation. A multidisciplinary team (consisting of attending physicians and residents, staff nurses and coordinators) was created for this QI initiative, time-based discharge plan. The DBN policy was implemented through repeated teaching sessions of attending physicians, residents, staff nurses and coordinators.

The intervention was structured around the Lean Six Sigma DMAIC framework [13]:

- *Define:* The problem of delayed discharges was defined through baseline data and stakeholder input.
- *Measure:* Pre-intervention metrics (DBN rate, discharge time, process time) were collected.
- *Analyze:* Root causes of delays (*e.g*., fragmented workflows, delayed summary completion) were identified.
- *Improve:* A standardized, time-based discharge protocol was implemented with multidisciplinary roles and clear deadlines.
- *Control:* Weekly audits and feedback sessions were held to sustain improvements.

A standardized, time-based discharge plan was implemented during the Improve phase, involving a multidisciplinary team (physicians, nurses, and a discharge coordinator). The process commenced one day prior, with key milestones: discharge planning at 4 PM, nursing checklist completion (which includes components of medical fitness before discharge, parents' knowledge about discharge plan) by 6 PM, discharge summary preparation (by resident on call) by 8 AM, billing initiation by 10 AM, and parent readiness by noon. Protocol training for staff and weekly progress meetings were conducted to ensure adherence. While 'noon' technically begins at 12:00 hours, it could extend to 1259 hours, as described in previous studies [17].

The study tool comprised a piloted, standardized data collection sheet auditing: (1) discharge timing (primary outcome: departure before 12:59), (2) process delays, and (3) demographic/clinical variables. The tool was piloted for clarity before implementation.

Data were analyzed using SPSS version 26. Frequency and percentages were computed for categorical variables. Numerical variables were summarized as medians with interquartile ranges (IQRs) because they were non-normally distributed. Normal data were expressed as mean ± standard deviation. The normality assumption was tested with the Shapiro-Wilk test. Continuous variables (discharge times, LOS) were compared before and after the intervention using Mann-Whitney U tests. An independent t-test was used when the data were normally distributed. Categorical variables (DBN rates) were compared before and after the intervention using Chi-square or Fisher's exact tests. Significance was set at $p<0.05$. Process time reductions were calculated as percentage changes.

RESULTS

Patient Demographics and Clinical Characteristics

This study included 300 pediatric patients admitted to a tertiary care hospital's paediatric ward, with balanced pre-intervention (n=150) and post-intervention (n=150) cohorts. Our demographic analysis revealed that both groups had similar baseline characteristics, with a median age of 3.0 (IQR: 1.0-5.0) years and male predominance (61.7%). The median hospital stay was 2 days (IQR: 1.0-3.0). There were no statistically significant differences in age distribution, treatment type, or insurance status between the groups (all $p > 0.05$), thus supporting the validity of our comparative analysis (**Table 1**).

During the study period, fewer than 5% of planned discharges were postponed due to unforeseen medical or administrative reasons, with no significant difference between pre- and post-intervention groups.

DBN Intervention's Relative Effectiveness

The intervention achieved comparable DBN success across all demographic subgroups (all $p > 0.05$), with no significant differences by age, gender, or insurance status, as shown in Table **2**. By implementing the DBN initiative, significant improvements in discharge efficiency were observed. In the pre-intervention period, only 3.3% of patients (n=5) achieved discharge before noon, whereas in the post-intervention group, it increased to 15.3% (n=23), representing a 4.5 fold improvement (OR: 5.02, 95% CI: 1.86-13.56, $p<0.001$) (**Fig. 1**).

The analysis revealed a significant reduction in median discharge time from 19.00 hours (IQR: 16.00-20.00) to 16.00 hours (IQR: 14.00-17.00) and in mean discharge process time from 8.4 hrs to 5.2 hrs, resulting in 38% faster discharges following the DBN intervention ($p<0.001$). The mean discharge

Table 1: Descriptive characteristics of the study population, including demographic, clinical, and discharge process variables.

Variables	Pre-Intervention (n=150)	Post Intervention (n=150)	Total (n=300)	p-value
Gender, n (%)				
Male	87 (58)	98 (65.3)	185 (61.7)	0.191
Female	63 (42)	52 (34.7)	115 (38.3)	
Age(years), Median (Q3 - Q1)	4.0 (1.0-6.0)	2.0 (1.0-5.0)	3.0 (1.0-5.0)	-
Age Group, n (%)				
<1 year	14 (9.3)	0 (0)	14 (4.7)	<0.001
1-5 years	78 (52)	115 (76.7)	193 (64.3)	
>5 years	58 (38.7)	35 (23.3)	93 (31.0)	
Hospital Stay, Median (Q3 - Q1)	2.0 (1.0-3.0)	3.0 (2.0-4.0)	2.0 (1.0-3.0)	-
Hospital Stay Group, n (%)				
<3 days	101 (67.3)	60 (40)	161 (53.7)	<0.001
3-7 days	44 (29.3)	82 (54.7)	126 (42.0)	
>7 days	5 (3.3)	8 (5.3)	13 (4.3)	
Treatment Type, n (%)				
Medical	105 (70)	140 (93.3)	245 (81.7)	<0.001
Surgical	45 (30)	10 (6.7)	55 (18.3)	
Type of Insurance, n (%)				
Self-pay	92 (61.3)	90 (60)	182 (60.7)	0.906
Insurance	58 (38.7)	60 (40)	118 (39.3)	

Table 2: Comparison of patients discharged before and after noon across various demographic and clinical risk factors.

Variables	Pre-Intervention (n=150)			Post-Intervention (n=150)		
	Discharge by Noon		p-value	Discharge by Noon		p-value
	Yes	No		Yes	No	
Gender, n (%)						
Male	3 (60)	84 (57.9)	1.000	14 (60.9)	84 (66.1)	0.640
Female	2 (40)	61 (42.1)		9 (39.1)	43 (33.9)	
Age Group, n (%)						
<1 year	0 (0)	14 (9.7)	0.787	0 (0)	0 (0)	0.286
1-5 years	2 (40)	76 (52.4)		20(87)	95 (74.8)	
>5 years	3 (60)	55 (37.9)		3 (13)	3 2(25.2)	
Hospital Stay Group, n (%)						
<3 days	4 (80)	97 (66.9)	1.000	10 (43.5)	50 (39.4)	0.928
3-7 days	1 (20)	43 (29.7)		12 (52.2)	70 (55.1)	
>7 days	0 (0)	5 (3.4)		1 (4.3)	7 (5.5)	
Treatment Type, n (%)						
Medical	4 (80)	101 (69.7)	1.000	20 (87)	120 (94.5)	0.183
Surgical	1 (20)	44 (30.3)		3 (13)	7 (5.5)	
Type of Insurance, n (%)						
Self-pay	4 (80)	88 (60.7)	0.649	14 (60.9)	76 (59.8)	1.000
Insurance	1 (20)	57 (39.3)		9 (39.1)	51 (40.2)	

Chi-square/Fisher exact test was applied, P-value<0.05, considered significant.

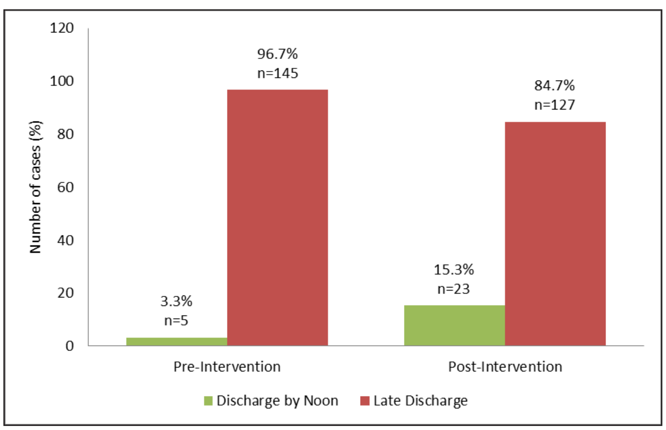

Fig. (1): Distribution of patients for Discharge by Noon (DBN) according to groups.

summary time was also reduced by 57% (from 6.8 hrs to 2.9 hrs) in the post-intervention group (**Table 3**). After DBN implementation, discharge timing from a pre-intervention peak at 17:00-20:00 (n=112) shifted to 12:00-15:00 (n=89) post-implementation, with 89% reduction in late discharges (>20:00) from 27 to 3 cases (p<0.001) (**Fig. 2**).

DISCUSSION

The findings of our study suggest that implementing a multidisciplinary Discharge Before Noon (DBN) initiative significantly improved discharge efficiency in our pediatric ward, as evidenced by a 4.5-fold increase in noon discharges from 3.3% to 15.3% (p<0.001) and a reduction in median discharge time by 3 hours. Though these findings are consistent with international standards, they also highlight the distinct struggles faced by hospitals in low- and middle-income countries (LMICs). These insights contribute to the literature in several critical ways. For instance, while our absolute DBN rate is far below the 38-80% reported in higher-income settings (White *et al.*, 2014; Wertheimer *et al.*, 2014) [9, 10], the magnitude of improvement exceeds typical gains in similar interventions, likely due to our particularly low baseline performance. This suggests that even with modest investments in discharge processes, significant impacts can be made in LMICs where discharge delays are commonplace.

Table 3: Comparison of discharge metrics before and after DBN intervention.

Metric	Pre-Intervention	Post-Intervention	p-value
DBN Achievement, n (%)	5 (3.3)	23 (15.3)	<0.001
Discharge Summary Time (hours), mean ± SD	6.8 ± 2.5	2.9 ± 1.2	<0.001
Discharge Time (24-hr clock), median (IQR)	19:00 (16:00-20:00)	16:00 (14:00-17:00)	<0.001
Total Discharge Process Time (hours), mean ± SD	8.4 ± 3.1	5.2 ± 2.0	0.003

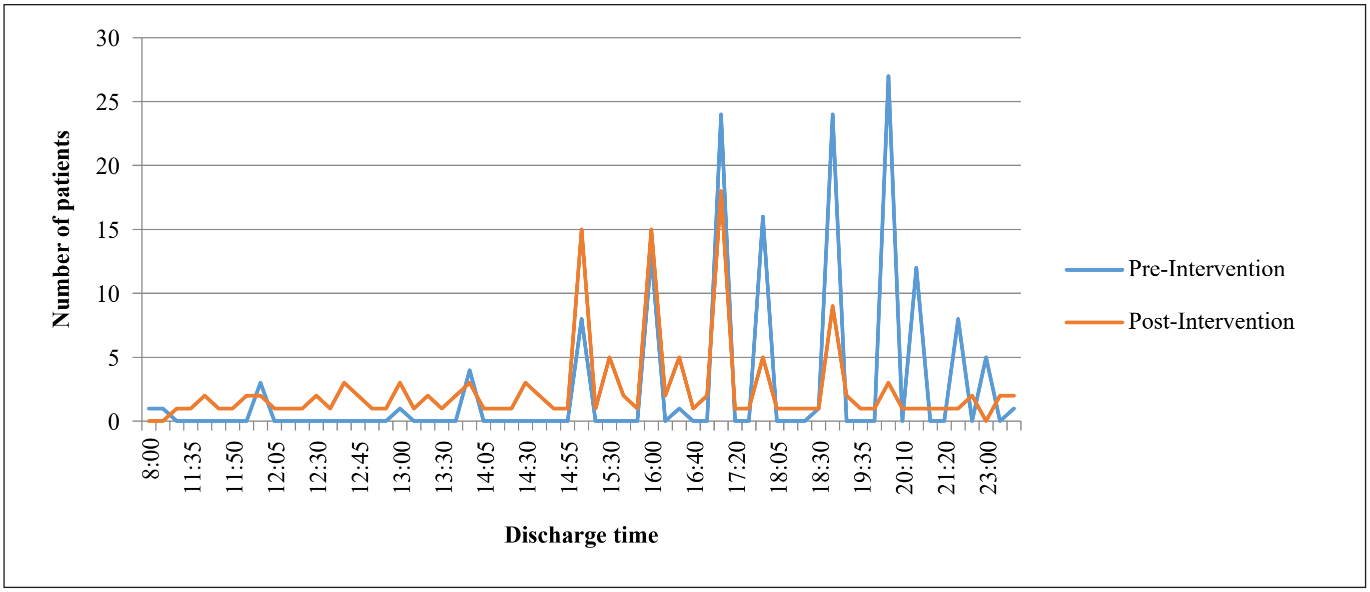

Fig. (2): Discharge time (patient left from ward) of patients for pre- and post-intervention groups.

Our successful intervention can be attributed to three crucial factors. First, the multidisciplinary approach – involving attending physicians, residents, staff nurses, and coordinators - addressed the fragmentation of care that contributes significantly to discharge delays, 35-50% as observed by Wu *et al*., 2016 [18]. Interestingly, resident physicians emerged as key change agents, adding nuance to the traditional emphasis on nurse-led teams (White *et al*., 2014) [9]. Second, the operational definition of "Discharge Before Noon" (DBN) as departure before 12:59 hours balanced precision and practicality, allowing for the completion of final discharge tasks while creating a measurable endpoint. This approach contrasts with more rigid "hard-stop" methods that often fail in real-world settings (Wertheimer *et al*., 2014) [10]. Finally, our study demonstrates that lean Six Sigma methodology as described by El-Eid *et al*. (2015) and dos Santos Zimmermann *et al*. [8, 13], can be successfully adapted to resource-limited environments, as it can be seen by a remarkable 38% reduction in the mean discharge process time (8.4 to 5.2 hours) and a 57% (6.8 to 2.9 hours) decrease in discharge summary completion time. However, there might be some modifications for better improvements.

Despite these improvements, our study still faced some unique challenges. While we managed to significantly reduce late-night discharges (>20:00) by 89%, 11% of discharges still occurred in the evening due to unavoidable delays, such as specialist consultations and testing - systemic constraints well documented in LMIC hospitals (da Silva *et al*., 2014) [19].

LIMITATIONS

There are several limitations to our study. As a single-center study, our results may not generalize to other settings, particularly those with different staffing ratios or patient populations. The majority of medical cases (81.7%) in our cohort restrict understanding of surgical patient workflows. The short follow-up period of only 12 months in our study prevents assessment of whether improvements will be sustained over time, an important consideration given that discharge efficiency initiatives often show waning effects without ongoing reinforcement (Kane *et al*., 2016) [6].

CONCLUSION

Our research demonstrates that a tailored DBN initiative, leveraging multidisciplinary teamwork and Lean Six Sigma, can significantly enhance discharge efficiency in pediatric wards of LMICs. While the improvement is substantial, sustaining these gains will require ongoing reinforcement, technological support, and policy integration. This model offers a scalable framework for similar resource-constrained settings.

RECOMMENDATIONS

Future directions should focus on two critical areas. First, as demonstrated by Sklansky *et al*. (2019) [20], technology integration through Electronic Health Records (EHR) alerts could help sustain gains by providing real-time feedback on pending discharge tasks. Second, as there is a predominance of medical (*versus* surgical) cases in our cohort (81.7%), tailored approaches for surgical patients, potentially incorporating family-centered education models (Walter & Robb, 2019) [12], may help close the current medical-surgical disparity.

ETHICAL APPROVAL

Ethical approval was obtained from the Institutional Review Committee of Liaquat National Hospital and Medical College, Karachi (REF letter No. App # 0762-2022 LNH-ERC). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/ or national research committee and the Helsinki Declaration.

CONSENT FOR PUBLICATION

Written informed consent was taken from the parents or legal guardians.

AVAILABILITY OF DATA

The data set may be acquired from the corresponding author upon a reasonable request.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge all the people who worked and helped us in this study, especially the staffs, ward coordinators and the residents.

AUTHORS' CONTRIBUTION

AH: concepts, design, and literature search, AN: initial draft and design, HA and IA: data acquisition and manuscript drafting, RN, EJ, and IZ: data and statistical analysis, RN and AH: manuscript design, and drafting, RN, and AS: critical review and revision. All authors read and approved the final article.

GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work the author(s) limitedly used ChatGPT (GPT-4, OpenAI) to get language suggestions and do minor proofreading in some parts of the manuscript. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the published article.

REFERENCES

1. Micallef A, Buttigieg SC, Tomaselli G, Garg L. Defining delayed discharges of inpatients and their impact in acute hospital care: a scoping review. Int J Health Policy Manag 2022; 11(2): 103-11. DOI: https://doi.org/10.34172/ijhpm.2020.94 PMID: 32610822
2. Bryan K. Policies for reducing delayed discharge from hospital. Br Med Bull 2010; 95: 33-46. DOI: https://doi.org/10.1093/bmb/ldq020 PMID: 20647227
3. Rojas-García A, Turner S, Pizzo E, Hudson E, Thomas J, Raine R. Impact and experiences of delayed discharge: A mixed-studies systematic review. Health Expect 2018; 21(1): 41-56. DOI: https://doi.org/10.1111/hex.12619 PMID: 28898930
4. Rosman M, Rachminov O, Segal O, Segal G. Prolonged patients' in-hospital waiting period after discharge eligibility is associated with increased risk of infection, morbidity and mortality: a retrospective cohort analysis. BMC Health Serv Res 2015; 15: 246. DOI: https://doi.org/10.1186/s12913-015-0929-6 PMID: 26108373
5. Aggarwal K, Singh B, Banker H, Stoltzfus MT, Hong J, Anamika FNU, *et al*. Exploring the ramifications of delayed hospital discharges: impacts on patients, physicians, and healthcare systems. Cureus 2024; 16(5): e61249. DOI: https://doi.org/10.7759/cureus.61249 PMID: 38939266
6. Kane M, Weinacker A, Arthofer R, Seay-Morrison T, Elfman W, Ramirez M, *et al*. A multidisciplinary initiative to increase inpatient discharges before noon. J Nurs Adm 2016; 46(12): 630-5. DOI: https://doi.org/10.1097/nna.0000000000000418 PMID: 27851703
7. Hamline MY, Speier RL, Dai Vu P, Tancredi D, Broman AR, Rasmussen LN, *et al*. Hospital-to-home interventions, use, and satisfaction: a meta-analysis. Pediatrics 2018; 142(5): e20180442. DOI: https://doi.org/10.1542/peds.2018-0442 PMID: 30352792
8. El-Eid GR, Kaddoum R, Tamim H, Hitti EA. Improving hospital discharge time: a successful implementation of six sigma methodology. Medicine (Baltimore) 2015; 94(12): e633. DOI: https://doi.org/10.1097/MD.0000000000000633 PMID: 25816029
9. White CM, Statile AM, White DL, Elkeeb D, Tucker K, Herzog D, *et al*. Using quality improvement to optimize paediatric discharge efficiency. BMJ Qual Saf 2014; 23(5): 428-36. DOI: https://doi.org/10.1136/bmjqs-2013-002556 PMID: 24470173
10. Wertheimer B, Jacobs REA, Bailey M, Holstein S, Chatfield S, Ohta B, *et al*. Discharge before noon: an achievable hospital goal. J Hosp Med 2014; 9(4): 210-4. DOI: https://doi.org/10.1002/jhm.2154 PMID: 24446232
11. Hunter M, Peters S, Khumalo N, Davies MA. Analysis of patient flow and barriers to timely discharge from general medical wards at a tertiary academic hospital in Cape Town, South Africa. BMC Health Serv Res 2024; 24(1): 287. DOI: https://doi.org/10.1186/s12913-024-10806-6 PMID: 38448938
12. Walter L, Robb M. Promoting discharge readiness through staff education: a family-centered approach. J Nurses Prof Dev 2019; 35(3): 132-6. DOI: https://doi.org/10.1097/nnd.0000000000000519 PMID: 30762841
13. dos Santos Zimmermann G, Bohomol E. Lean Six Sigma methodology to improve the discharge process in a Brazilian intensive care unit. Rev Bras Enferm 2023; 76(3): e20220538. DOI: https://doi.org/10.1590/0034-7167-2022-0538 PMID: 37436235
14. Balasundaram M, Porter M, Miller S, Sivakumar D, Fleming A, McCallie K. Increasing parent satisfaction with discharge planning: an improvement project using technology in a level 3 NICU. Adv Neonatal Care 2022; 22(2): 108-18. DOI: https://doi.org/10.1097/anc.0000000000000841 PMID: 33534225

15. Everall AC, Guilcher SJT, Cadel L, Asif M, Li J, Kuluski K. Patient and caregiver experience with delayed discharge from a hospital setting: a scoping review. Health Expect 2019; 22(5): 863-73.
DOI: https://doi.org/10.1111/hex.12916 PMID: 31099969

16. van den Ende E, Schouten B, Pladet L, Merten H, van Galen L, Marinova M, *et al*. Leaving the hospital on time: hospital bed utilization and reasons for discharge delay in the Netherlands. Int J Qual Health Care 2023; 35(2): mzad022.
DOI: https://doi.org/10.1093/intqhc/mzad022 PMID: 37148301

17. Orewa GN, Feldman SS, Hearld KR, Kennedy KC, Allyson G. Using Accountable Care Teams to Improve Timely Discharge: A Pilot Study. Qual Manag Health Care 2022; 31(1): 22-27.
DOI: https://doi.org/10.1097/qmh.0000000000000320 PMID: 34354033

18. Wu S, Tyler A, Logsdon T, Holmes NM, Balkian A, Brittan M, *et al*. A quality improvement collaborative to improve the discharge process for hospitalized children. Pediatrics 2016; 138(2): e20143604.
DOI: https://doi.org/10.1542/peds.2014-3604 PMID: 27464675

19. da Silva SA, Valácio RA, Botelho FC, Amaral CFS. Reasons for discharge delays in teaching hospitals. Rev Saude Publica 2014; 48(2): 314-21.
DOI: https://doi.org/10.1590/S0034-8910.2014048004971 PMID: 24897053

20. Sklansky DJ, Butteris S, Shadman KA, Kelly MM, Edmonson MB, Nackers K, *et al*. Earlier hospital discharge with prospectively designated discharge time in the electronic health record. Pediatrics 2019; 144(5): e20190929.
DOI: https://doi.org/10.1542/peds.2019-0929 PMID: 31604828