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Enhancing Patient Safety in a Tertiary Care Hospital Through Continuous Quality Improvement: Reducing Discharge Medication Errors Across All Wards

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Abstract

To enhance patient healthcare by implementing a consistent daily discharge prescription audit, integrating quality improvement initiatives led by clinical pharmacists in clinical areas, and ensuring regular monitoring. Over a 15-month period, a clinical pharmacist conducted daily reviews of discharge medication order sheets across all wards on a random basis. Upon detecting an error, immediate intervention was carried out during the audit, and the error was reported to the respective department head and medical administration. This facilitated targeted training for the concerned staff to prevent recurrence and improve overall medication safety. The Quality Improvement Project was implemented from July 2023 to September 2024. Analysis of defined parameters identified key root causes of discharge medication errors, including incorrect drug orders, omitted prescriptions, incorrect dosage strength, incorrect frequency, and therapeutic duplication. As a result of the intervention, discharge prescription errors were reduced from 13% to 1.82%. This quality improvement project across all wards has facilitated the early detection of discharge prescription errors, leading to continuous improvements in prescribing practices. Consequently, it has contributed to enhancing patient safety throughout the treatment process.

Keywords: Continuous Quality Improvement Project, Rational Discharge paper Prescription Audit, Medication errors.

1. Introduction

Discharge Prescription audit is an important process that checks for quality improvement in patient health care by Quality Improvement Project.[1-5] . Patient-Care-Quality improvement has been implemented through Discharge paper prescription audit of in-patients. Discharge Prescription audit is most important part of health-care system whereby the right dose- of - the right medicine - to- the right patient - at- right time -with right-route of administration is delivered.1-5. Patient safety gets compromised whenever there

is an error like Discharge prescription errors like therapeutic duplication, incorrect strength/ frequency/ dosage form in the patient final discharge paper sheet.

2. Aim & Objective:

The primary aim & Objective of the study was to continuously identify and eliminate poor or deficient practices while minimizing patient harm through the early detection and prevention of discharge medication errors across all wards, achieved through daily prescription audit rounds.

3. Methodology:

Over a fifteen-month period, a clinical pharmacist conducted daily reviews of discharge medication order sheets and drug prescriptions across all wards on a random basis. Whenever an error was identified, immediate intervention was carried out during the audit, and the issue was reported to the respective department head, medical administration, and nursing in-charge for staff training. The project was then structured into the following three phases for focused implementation.

A) Phase 1 (problem identification)

Clinical pharmacist was assigned to review Randomly Discharge medication order sheets on daily basis at all wards following checklist Parameters to ensure that right drug was given to right patient,

Discharge prescription auditing for improving patient care:

- Patient information: Name, Age, Sex, Weight.
- Doctors Information: Name, Registration number, and Signature.
- Medicine Information: Prescription written in capital letters, route of administration, strength, frequency, time of administration, therapeutic duplication, and legibility of the prescription.

All the above sub-types of Discharge medication errors were classified according to the severity of the consequence it caused, using the definitions provided by Hartwig, Denger, and Schneider. The severity of the Medication error could range from a potential error that did not reach the patient (level A), up to an error that resulted in patient death (level I). Discharge Prescription error % was determined as the ratio of the number of Discharge prescription errors to the total number of audited Discharge medication orders.

B) Phase 2 (Discharge papers -problem elimination)

- Maintained the report department-wise & Assigned members of the department heads to review the error-prone area.
- Streamline different Discharge medication errors Parameters through continuous Training sessions for Doctors and Nurses.
- Standardization of practice with proper corrective and preventive actions.

C) Phase 3 (Discharge Paper – Ensuring Sustainability):

- Regular discharge prescription audit rounds were conducted by the clinical pharmacist to establish a systematic review and verification process.
- This initiative aimed to enhance patient safety and sustain improvements through the ongoing implementation of the quality improvement project.
- Medical officers after preparing the discharge summary started getting the discharge prescription checked by the senior assigned staff nurse for verification of the contents.

4. Result:

Over three thousand Discharge prescriptions were audited by Clinical Pharmacist from July 2023 to Se-

ptember 2024. Errors in audit findings are classified as per NCC MERP (National Coordinating Council for Medication Error Reporting and Prevention). Improvement observed due to daily Discharge papers audits, and we could improve in overall Discharge Medication Errors from 13% to 1.82%.

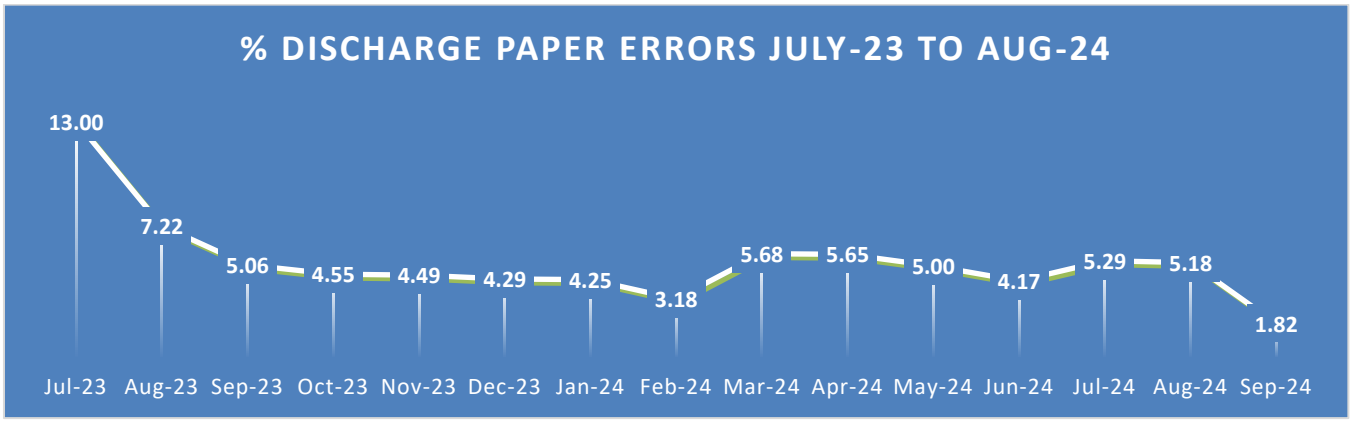

Fig.1- Graph Discharge Prescription Medication error

	Jul-23	Aug-23	Sep-23	Oct-23	N0v-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24
Total In month	**26**	**13**	**9**	**9**	**11**	**9**	**9**	**7**	**10**	**13**	**10**	**7**	**12**	**13**	**4**
Total Dis-charge pa-per Au-dited	**200**	**180**	**178**	**198**	**245**	**210**	**212**	**220**	**176**	**230**	**200**	**168**	**227**	**251**	**220**
%	**13.00**	**7.22**	**5.06**	**4.55**	**4.49**	**4.29**	**4.25**	**3.18**	**5.68**	**5.65**	**5.00**	**4.17**	**5.29**	**5.18**	**1.82**

Tabel.1- Discharge Prescription Medication error Summary report in Tabel format

The analysis in Figure 1 & Table 1 indicates a surge in discharge prescription medication errors in July 2023, coinciding with the initiation of the quality improvement project. This increase was attributed to the introduction of physical verification of discharge medication orders against the medicines available with patients.

From March 2024 onward, a slight rise in errors was observed, primarily due to the implementation of the new OHUM software. The most common root causes of errors identified in the final discharge prescriptions included:

- Incorrect medication strength

- Incorrect frequency of administration
- Omitted medication orders
- Incorrect medication orders

Action Taken:

Based on department-wise reports provided by the clinical pharmacist, the medical administration team instructed all RMO doctors and department heads to adhere to safe practices while preparing final discharge medication orders. To mitigate errors, training sessions were conducted for Consultants and RMO doctors, supported by discussions in clinical risk management committee meetings. Medical Officers developed the system of maker and checker after writing the discharge medications and before handing over to patients. Software-related points were asked to develop from the vendor side as per the need of the error free system. As a result of these interventions, discharge prescription medication errors improved by 11.18% by September 2024. Ongoing training sessions continue to ensure further improvement in prescription accuracy and patient safety.

5. Discussion

A) Statement of Principal Findings

The study highlights that discharge prescription errors are a significant patient safety concern, with an initial error rate of 13%. Through the implementation of a structured discharge prescription audit, the error rate was successfully reduced to 1.82%. The most frequent types of errors included incorrect medication strength, incorrect frequency, omitted medication orders, and improper medication orders. The systematic audit process, combined with immediate corrective actions and staff training, played a crucial role in enhancing prescription accuracy and patient safety.

B) Strengths & Limitations

Strengths:

The study was conducted over an extended period (15 months), allowing for a comprehensive evaluation of trends and improvements. A systematic approach involving all stakeholders (clinical pharmacists, RMOs, consultants, and medical administration) ensured multidisciplinary engagement and accountability. Implementation of real-time interventions, including training sessions and software modifications, contributed to sustained improvements in prescription accuracy. The "maker and checker" system introduced an additional layer of verification, reducing preventable errors before discharge.

Limitations:

The study was conducted in a single tertiary care hospital, which may limit the generalizability of findings to other healthcare settings. Although software modifications were made to reduce errors, system-based errors may still persist due to human factors. The study relied on manual audits, which, despite being effective, may introduce variability in detection rates depending on the auditor's diligence and experience.

C) Interpretation with the Context of the Wider Literature

Discharge prescription errors have been widely recognized as a prevalent issue in patient safety literature. Studies have reported similar error types, including incorrect drug dosages, omitted medications, and transcription errors. Research suggests that involving clinical pharmacists in medication reconciliation significantly improves prescription accuracy and patient outcomes. This study aligns with prior findings that pharmacist-led audits can act as a safeguard against medication errors. The decrease from 13% to 1.82% mirrors results from global studies demonstrating the effectiveness of continuous quality improvement (CQI) programs in minimizing prescribing errors.

D) Implications for Policy, Practice & Research

Policy: Hospitals should integrate routine discharge prescription audits into their standard operating procedures to minimize medication errors and improve patient safety.

Practice: Regular training sessions for healthcare professionals on prescription writing and medication reconciliation should be mandatory. The implementation of a "maker and checker" system should be institutionalized to ensure a final layer of verification.

Research: Further studies should explore the long-term impact of discharge prescription audits across multiple healthcare institutions. Additionally, research can evaluate the effectiveness of AI-driven prescription verification tools in reducing human errors.

6. Conclusion

The implementation of a structured discharge prescription audit led to a significant reduction in medication errors, reinforcing the importance of continuous quality improvement initiatives in healthcare. The integration of real-time interventions, training, and multidisciplinary collaboration ensured that corrective actions were promptly implemented, fostering a culture of patient safety. The findings underscore the necessity of ongoing audits and educational programs to sustain and further improve discharge prescription practices in hospital settings. This quality improvement initiative has instilled a “Do-it-Right” attitude among healthcare professionals in the superspeciality tertiary care hospital, reinforcing a commitment to excellence in patient safety and medication management.

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