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Improving the emergency services using quality improvement project and Donabedian model in a quaternary teaching hospital in South India

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What is already known on this topic?

- Factors affecting the Emergency department's(ED)performance such as waiting time, overcrowding, delays, high turnaround time, wait time to triage, the causes of such phenomenon, the effect on patient outcome and the limited interventions suitable for high-resource setting

What this study adds?

- A successful redesign of the delivery of care through ED Quality Improvement(QI) process and team.
- The study focuses on a low-resource setting, where there is a lack of literature on QI projects using the Donabedian model for process improvement and outcome measurement.
- Therefore, this research outlines the effective implementation of the QI initiative, highlighting its positive outcomes

How this study might affect research, practice or policy?

- This model can be applied to a low-resource setting towards change sustainability from a hospital-wide initiative to improve patient safety and quality.
- An empirical evidence and actionable guide to assist ED of low-resource settings.

Introduction

Primary Goal of quality improvement is to:

- Enhance patient outcomes in Emergency Department (ED)
- Timely and effective care
- Comprehending the challenges, evaluating current performance and implementing quality improvement projects, areas in need of enhancement can be pinpointed and addressed, resulting in better outcomes
- Enhancing emergency patient delivery

Methodology

- Interventional study - Quality improvement
- Follows the Plan-Do-Check-Act (PDCA) cycle guided by Donabedian model
- Descriptive statistics was employed to measure changes in outcomes before and after implementation
- Performance audit was conducted based on patient feedback and stakeholders' input
- Various ED indicators were measured
- Root cause analysis(RCA)
- Two PDCA cycles were implemented over 6 months followed by post implementation evaluation



- Team performed a cause-and-effect analysis to gain support for PDSA cycle
- Identified gaps were discussed and brainstormed
- Drawing from concepts of Donabedian framework,

Figure 1 Donabedian model as a framework for emergency department (ED). ESI, Emergency Severity Index; HAZMAT, hazardous materials; HVAC, heating, ventilation, and air conditioning; STAT, short turnaround time.

PDCA cycle 1

PDCA cycle 2

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Table 1 PDCA cycle 1 strategy details

Action aimed	Action details	Responsibility special point of contact	Timeline
Redesign structural changes	<ol style="list-style-type: none"> 1. Patient arrival area to identify level of urgency 2. Dedicated room space for different levels of triage 3. Dedicated chest pain and stroke priority area 4. Green outpatient department (OPD) for patients requiring ambulatory care 5. Temporary buffer and discharge area for hosting patients who need less treatment, are waiting for transportation, or are going to be admitted to inpatient care 6. Sound absorbing tiles and walls 	<ul style="list-style-type: none"> ▶ Projects and Operations department ▶ Quality assurance department 	May–July
Care transition	<ol style="list-style-type: none"> 1. Handover tools 2. Discharge planning 3. Discharge communication 4. Handover training 5. Dedicated offload nurse for triaging and assessing emergency medical services patients 6. Nurse discharge coordinators 	<ul style="list-style-type: none"> ▶ Clinical team ▶ Nursing team ▶ Quality assurance department ▶ Medical committee 	July–August
Policies, protocols and work instructions	<ol style="list-style-type: none"> 1. Patient triage 2. Patient management/ care protocols 3. Patient transfer and/or referrals 	<ul style="list-style-type: none"> ▶ Clinical team ▶ Nursing team ▶ Quality assurance team 	July–August
Pharmacy turnaround time	<ol style="list-style-type: none"> 1. Pharmacotherapy recommendations 2. Audits by clinical pharmacist tracking patient medication due times for repeat medications, completing medication histories, documenting patient body weight, height and allergies 3. Patient follow-up on culture and sensitivity results, adjusting or discontinuing therapy as needed 	<ul style="list-style-type: none"> ▶ Pharmacotherapeutic committee 	July–August
Training	<ol style="list-style-type: none"> 1. Disaster preparedness and management 2. Skill-based training for paramedical and emergency medicine technician 3. Communication skills training 4. Standard treatment guidelines for emergencies 	<ul style="list-style-type: none"> ▶ Disaster management committee ▶ Nursing team ▶ Medical committee 	May–July
Radiology and lab TAT	<ol style="list-style-type: none"> 1. STAT lab with rapid response capability 2. Point of care testing 3. Effective communication and channels of communication 4. Picture archiving and communication system (PACS) 	<ul style="list-style-type: none"> ▶ Lab committee ▶ Operations department ▶ Quality assurance department 	July–August
Patient throughput	<ol style="list-style-type: none"> 1. Nurse floor coordinator 2. Early assessment investigation and initial treatment (EAI) 3. Additional location for surges 4. Team composition interventions 5. Time to analgesia < 20 min 	<ul style="list-style-type: none"> ▶ Nursing team ▶ Medical committee 	May–July

HAZMAT, hazardous material; HVAC, heating ventilation airconditioning; PDCA, Plan-Do-Check-Act; STAT, short turn around time.

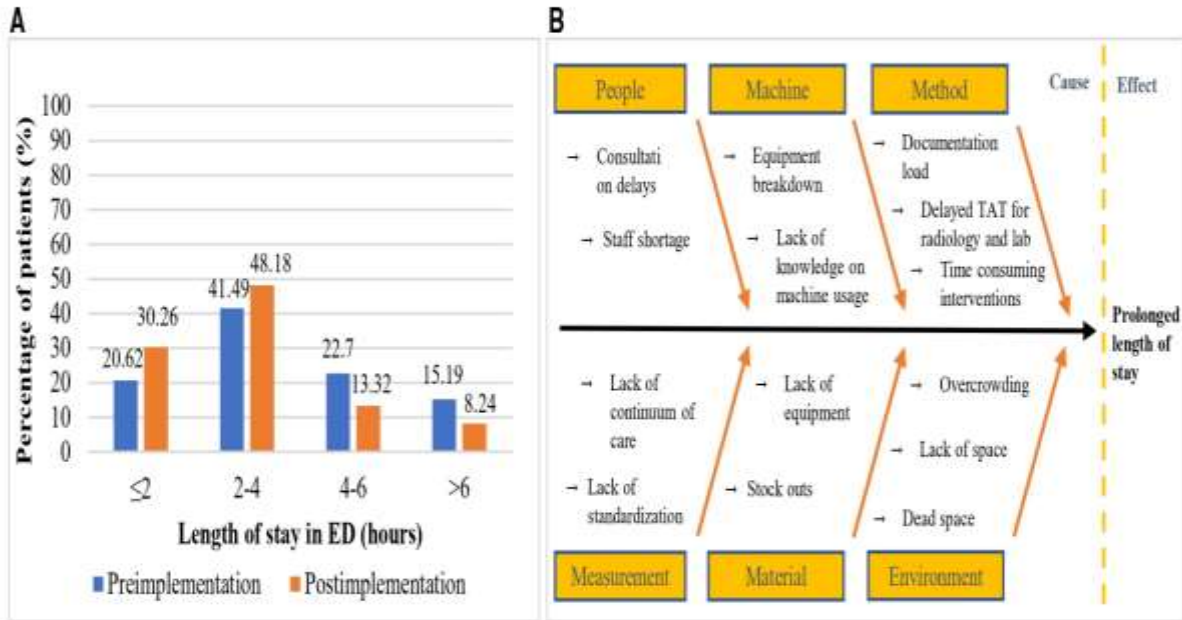
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Table 2 PDCA cycle 2 strategy details

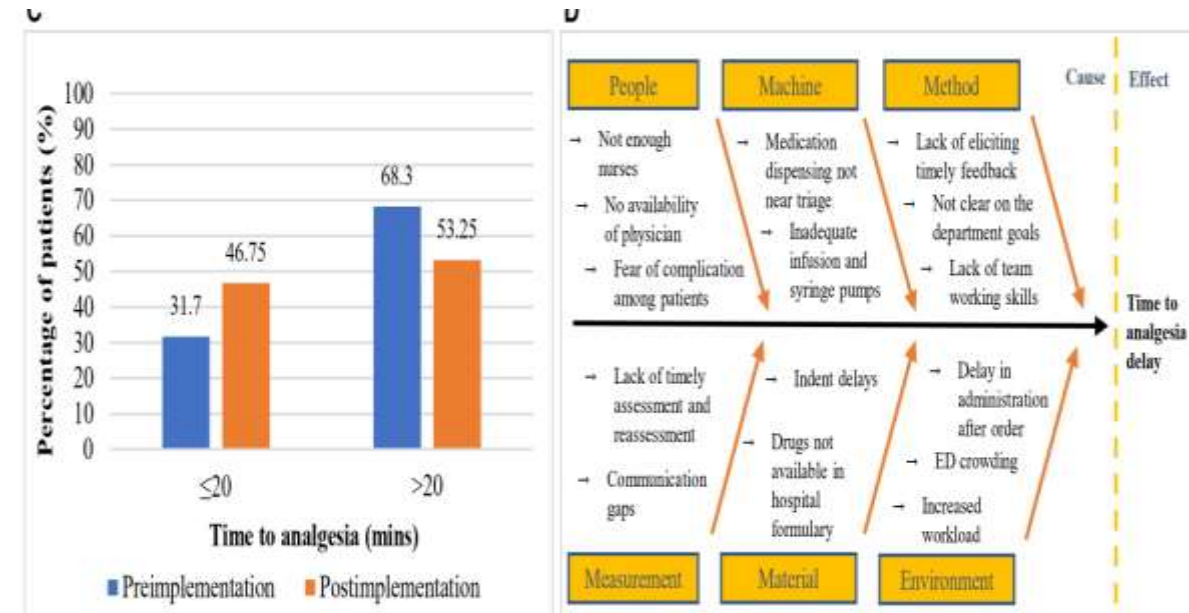
Action aimed	Action details	Responsible	Timeline
Professional development	<ol style="list-style-type: none"> 1. Customer service training 2. Resolution of expectations and negotiating agreement 3. Skills audit and feedback benchmarks 4. Workshops 	<ul style="list-style-type: none"> ▶ External support ▶ Quality assurance department ▶ Human resource department 	August–September
Communication and technology	<ol style="list-style-type: none"> 1. Process-driven checklist 2. E test requisition and radiology scheduler 3. Prehospital communication for ambulance 4. Critical report alert system 5. Monitoring frequency of communication and audit for failed communication 6. Communication scheme for example, whiteboard, text, cell phones 	<ul style="list-style-type: none"> ▶ Information technology team ▶ External vendors 	August–September

PDCA, Plan-Do-Check-Act.

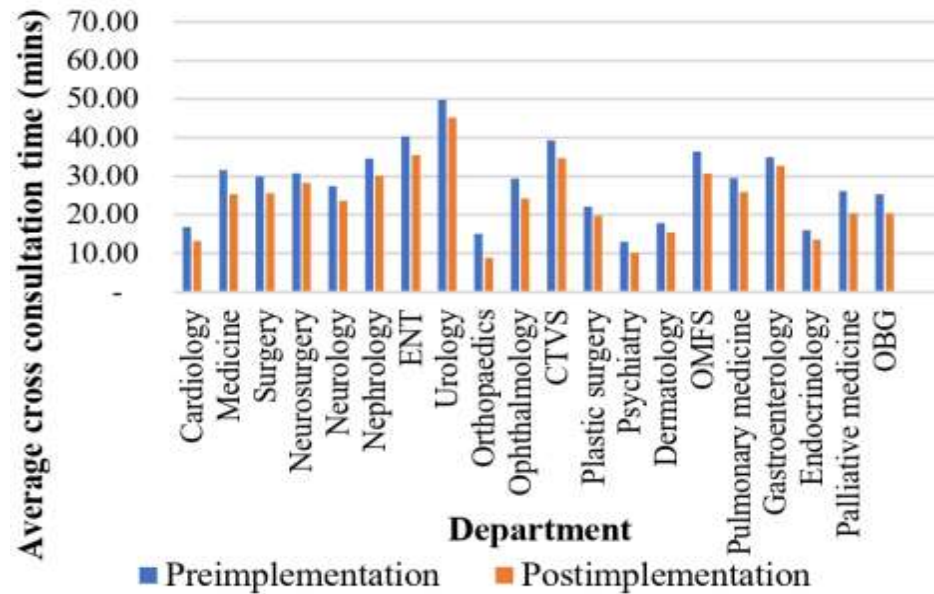
LOS in ED and factors affecting



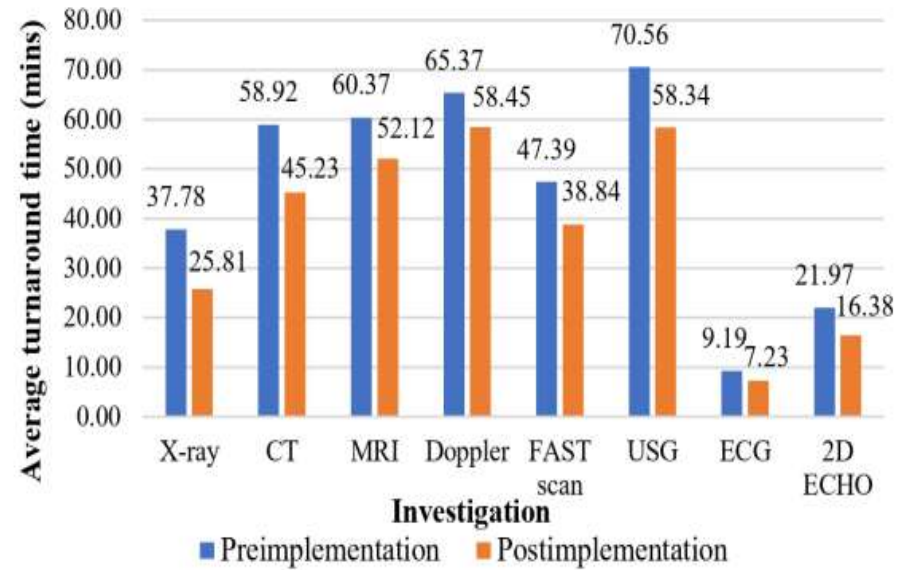
Time to analgesia in minutes & factors affecting



Cross consultation time



TAT for investigations



Average transfer time from ED and factors affecting

Clinical Correlation between type of compliant and diagnosis

ED patient revisits and left without being seen and factors affecting it

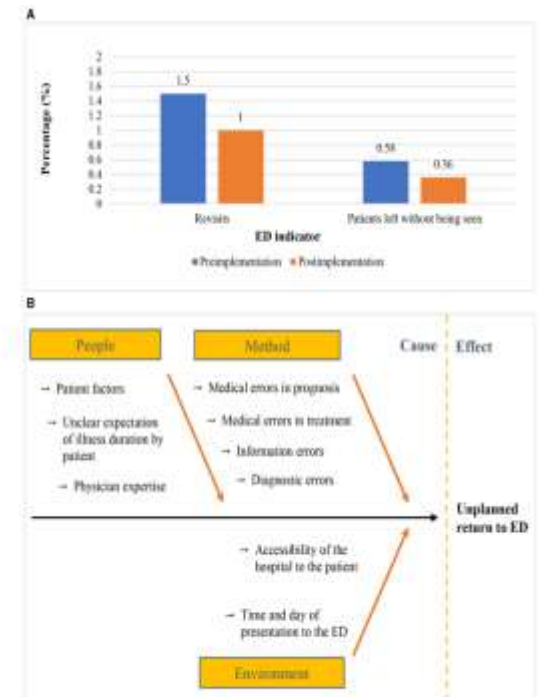
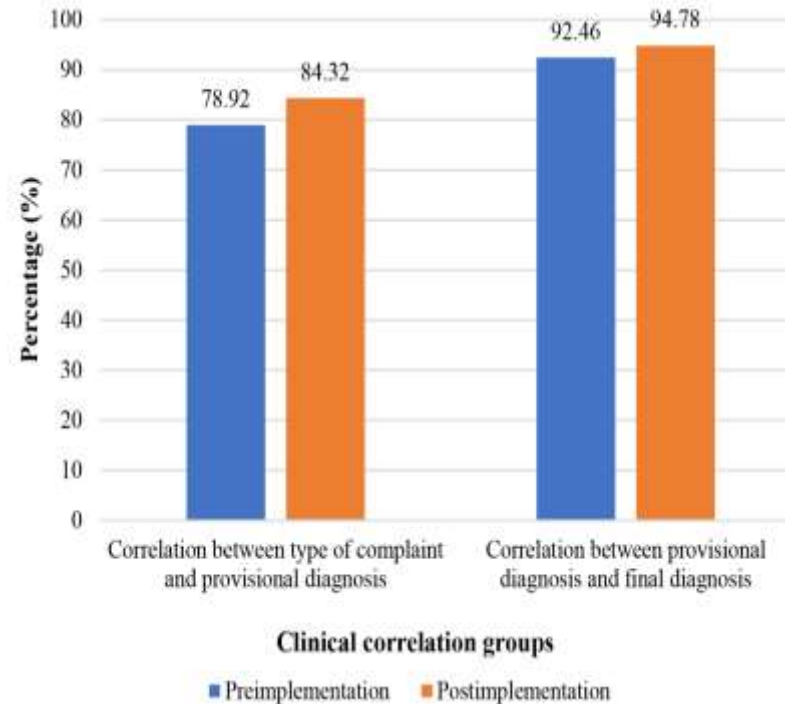
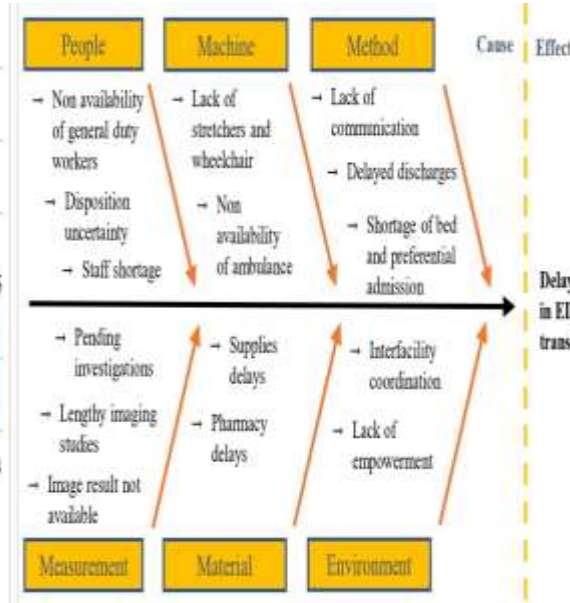
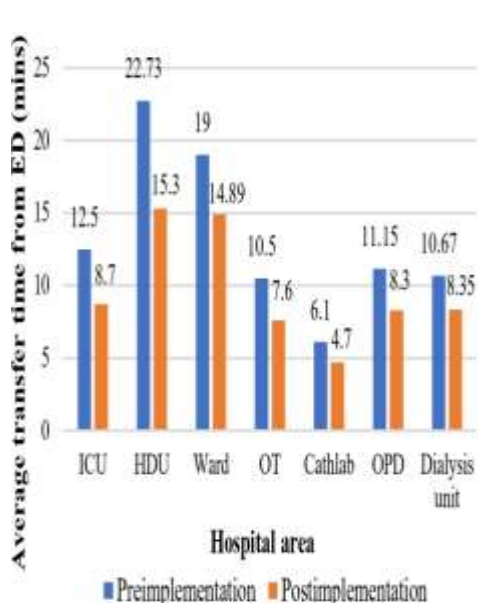


Figure 4. Analysis of emergency department (ED) patient revisits and patients left without being seen. (A) Percentage of revisits and patients left without being seen preimplementation and post implementation. (B) Cause-and-effect diagram for unexpected ED return visits within 72 hours.

Conclusion

- Through comprehensive assessments, performance audits and RCAs the project team identified key areas for improvement
- The study highlighted the importance of effective communication , teamwork and standardized protocols in enhancing ED efficiency and patient care
- The study serves as a valuable contribution to the literation on QI in low resource settings

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