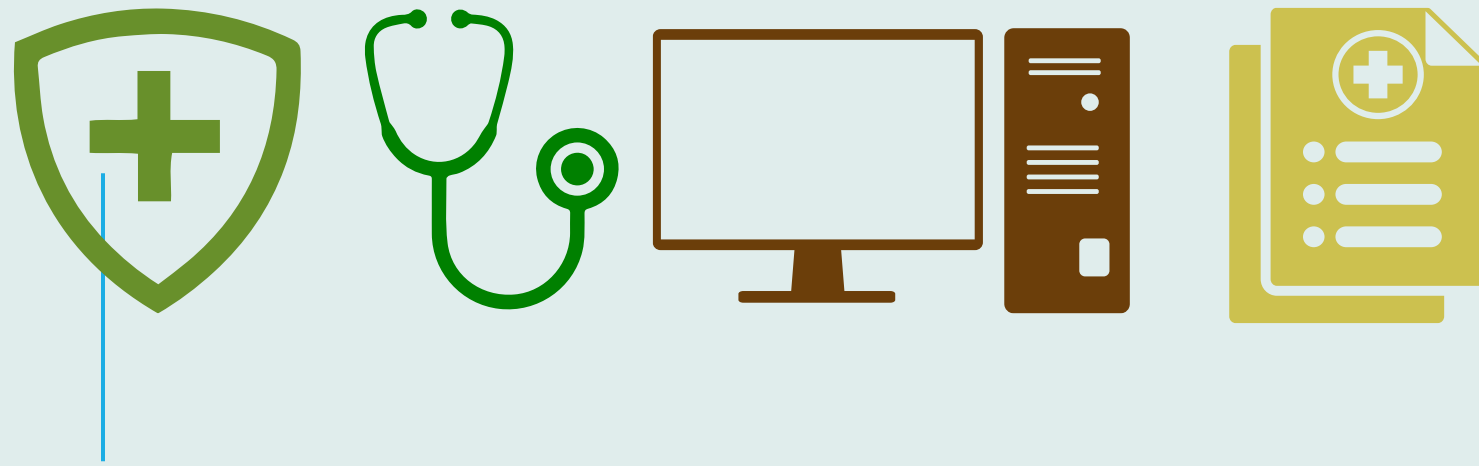




IMPACT OF EMR IMPLEMENTATION ON HOSPITAL WORKFLOWS, DOCTOR'S ADOPTION, AND TRAINING USEFULNESS.

EMR

Electronic Medical Record



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Introduction

Transforming Healthcare through EMR: The Fortis Escorts Hospital Experience

- In today's dynamic healthcare environment, hospitals must not only ensure clinical excellence but also streamline workflows, enhance patient experience, and ensure documentation accuracy.
- Electronic Medical Records (EMR) represent a pivotal shift from traditional paper-based systems to digital documentation, centralizing patient data such as vitals, medications, lab reports, and clinical notes.
- Fortis Escorts Hospital, Jaipur initiated EMR implementation to enhance efficiency, reduce medical errors, and enable coordinated, evidence-based patient care.
- This study focuses on evaluating the early outcomes of EMR adoption across outpatient departments, examining its influence on:
 - Workflow efficiency
 - Doctor engagement
 - Training effectiveness
- With growing emphasis on healthcare digitization in India, this research provides critical insights into real-world challenges, adoption patterns, and strategies for improving EMR integration in clinical practice.



Introduction



Purpose of the Study

To examine the real-world impact of transitioning from paper-based to electronic medical records in a high-volume tertiary care setting.

To evaluate whether EMR implementation at Fortis Escorts Hospital is achieving its intended outcomes of:

- Streamlined workflows
- Enhanced documentation quality
- Improved doctor efficiency and collaboration

To explore staff experiences, particularly those of doctors, regarding:

- Training effectiveness
- Ease of EMR usage
- Integration into daily routines

To identify key bottlenecks and departmental variances in adoption rates that can inform:

- Tailored improvement strategies
- Ongoing support needs
- Policy-level decisions for future EMR rollouts

Ultimately, the study serves as a diagnostic tool for hospital leadership to understand how EMRs are functioning on the ground and what interventions are needed for long-term success.



Research Questions

- 1. How does EMR implementation impact hospital on workflows?**
- 2. How useful was the doctors training in ensuring successful adoption of EMR implementation?**
- 3. What were the key challenges faced during EMR implementation?**

Research Objectives

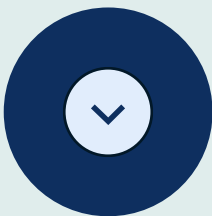
- 1. To analyze the impact of EMR implementation on hospital workflows.**
 - 2. To identify key challenges faced during and after EMR implementation.**
 - 3. To assess the usefulness of doctors training in ensuring successful implementation of EMR**
 - 4. To assess the level of doctors' adoption and satisfaction with use of EMR.**
- 

Review of Literature

Study	Year	Country	Sample Size / Setting	Key Findings	Implications
Health Foundation (Report)	2024	UK (NHS)	National-level analysis	EMR usage was hindered by poor design, lack of time, and insufficient training	Strong systems and better training essential—even in mature healthcare systems
Kavandi et al. (Scoping Review)	2024	Global	Review of outpatient EMR studies	Found recurring issues: workflow disruption, lack of training, and resistance	Emphasized co-design, planning, and sustained user support
Mwangi et al.	2023	Kenya	180 staff across 6 hospitals	Only 42% found system user-friendly; main issues: breakdowns and weak IT support	Systems must be tailored, reliable, and backed with on-site IT
Sharma et al.	2023	India – Delhi NCR	500+ healthcare workers in 3 hospitals	Doctors liked EMRs for data access; nurses struggled with added documentation burden	Automation and task-based interface design needed for different roles
Iqbal & Singh	2022	India – Bangalore	Private hospital staff	“Usefulness” mattered more than ease-of-use in adoption	Demonstrating practical benefits is more influential than just simplicity
Nuwas et al.	2022	Tanzania	Referral hospital	EMRs improved records management; lacked infrastructure and IT literacy	Emphasized foundational infrastructure and digital education
Wang et al.	2022	China	1,000+ doctors	78% found documentation better; older staff less satisfied due to digital gap	Age-specific support and interface simplicity are important
Rahman et al.	2021	Malaysia	450 healthcare staff	67% felt training was inadequate; 59% reported workflow disruptions	Role-specific training and visible leadership support are crucial
Thomas et al.	2021	India – Kerala	150 medical officers in a government college	EMRs helped diagnosis (80%), but slow systems frustrated users	Infrastructure upgrades and responsive support needed in busy departments

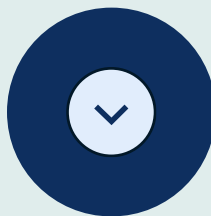
METHODOLOGY

Study Design and Period



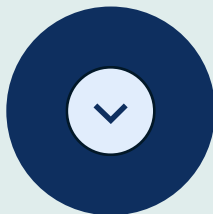
Study Design

Mixed-methods approach
(both quantitative and
qualitative analysis)



Study Duration

Conducted For 2
months



Study Setting

A tertiary care multi-
specialty institution



EMR was implemented across all OPD departments during the study period

METHODOLOGY

Sampling and Data Collection

Study Population

- Quantitative: 20,015 EMR medical cards created during the study period.
- Qualitative: A purposive sample of 50 doctors from different departments who were observed and assisted during EMR use.

Study Instruments and Variables

Quantitative Data Variables

- Department
- Doctor Name
- Completed Medical Cards
- In Progress (partially completed)
- Check-ins (not opened by doctor)

Qualitative Instruments

- Feedback from doctors
- Custom-designed EMR templates

Ethical Considerations

Consent: Verbal consent was obtained from all doctors involved in observations and template interventions.

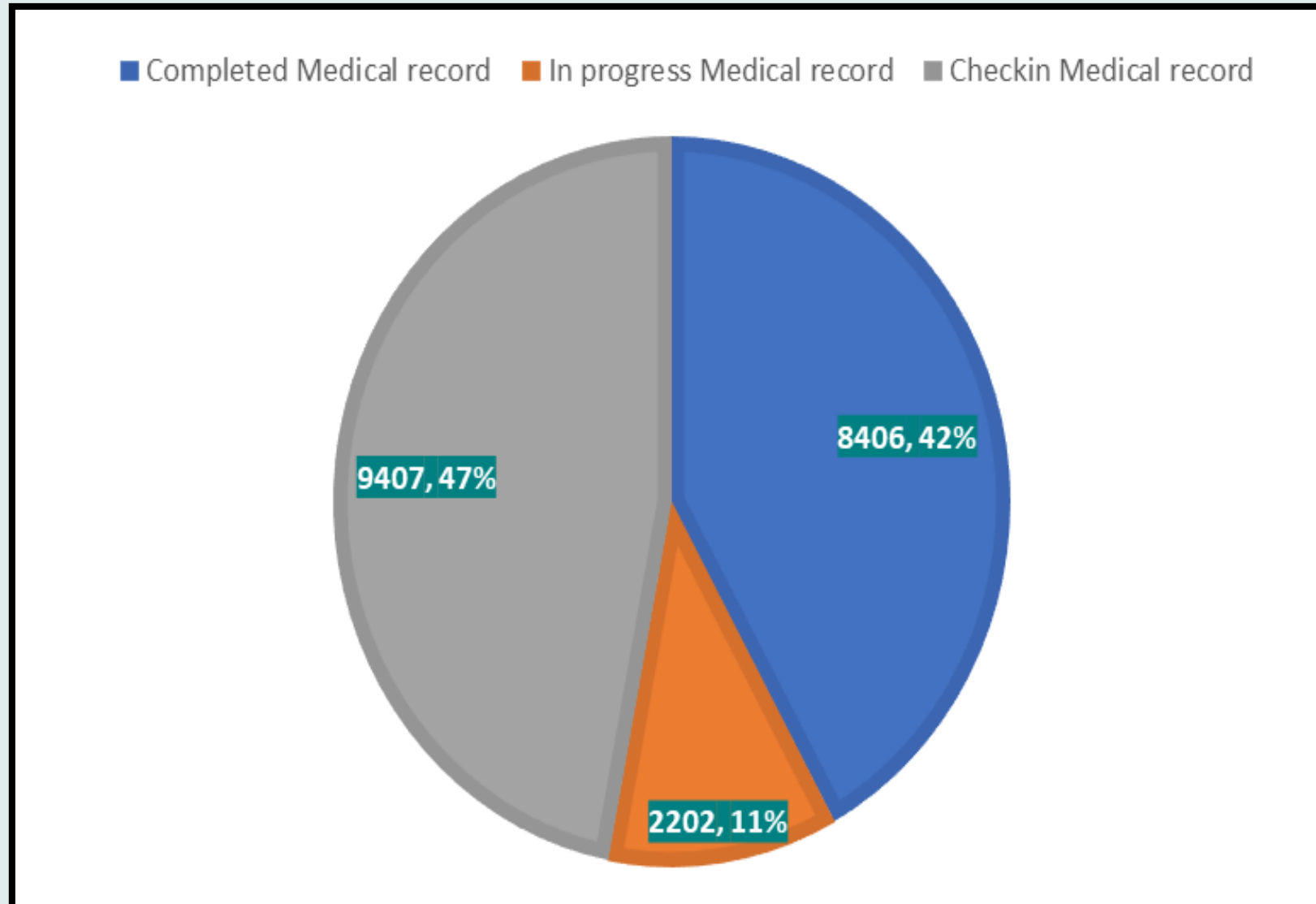
Confidentiality: No personal identifiers were collected; all data anonymized.

Data Security: All data stored in encrypted systems with restricted access.



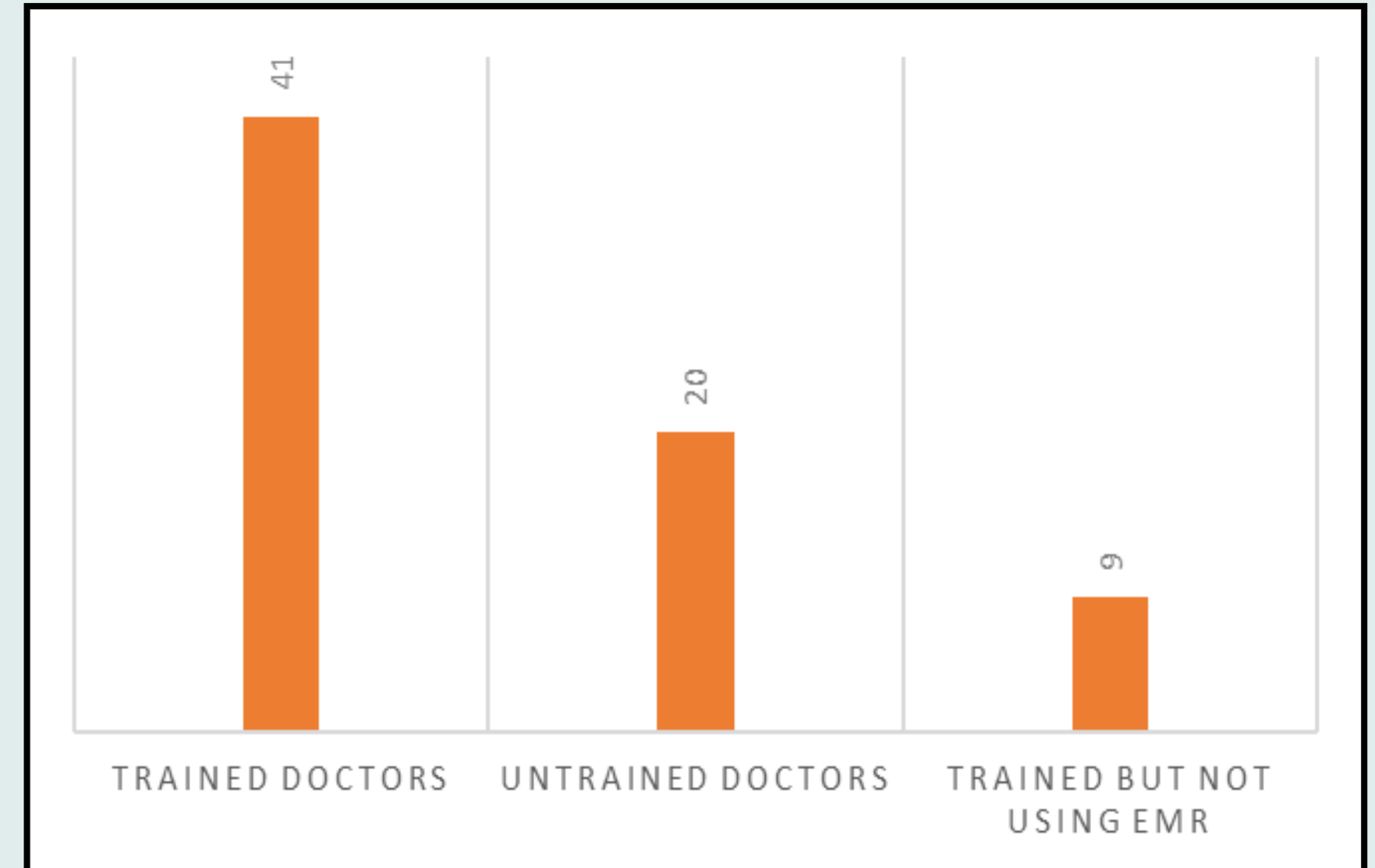
Data Analysis

**EMR medical record distribution
(N=20015)**



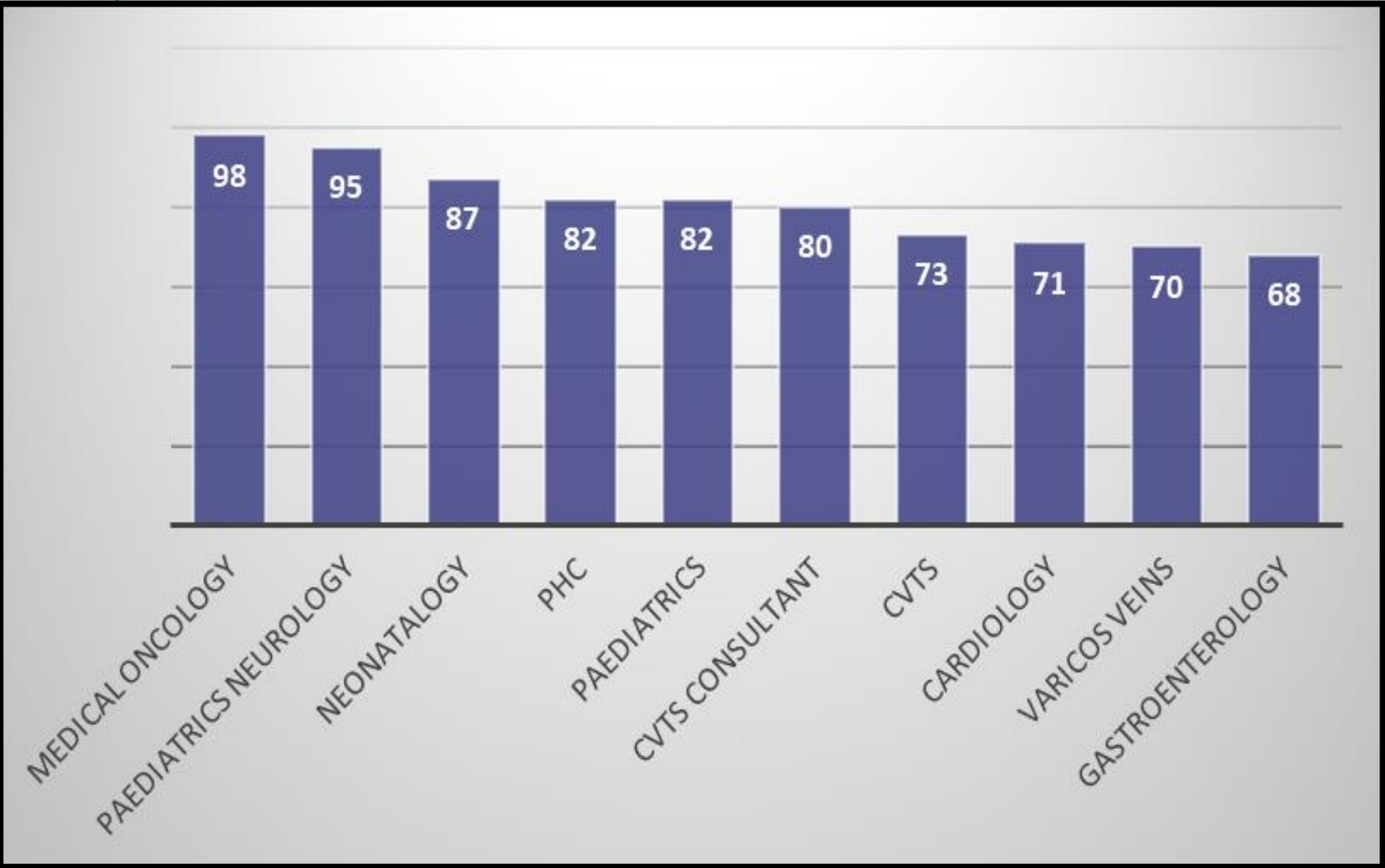
Only 42% of EMR records were completed, while 47% were never opened by doctors, indicating limited engagement.

Doctors Classification (OPD)-EMR Training and Usage



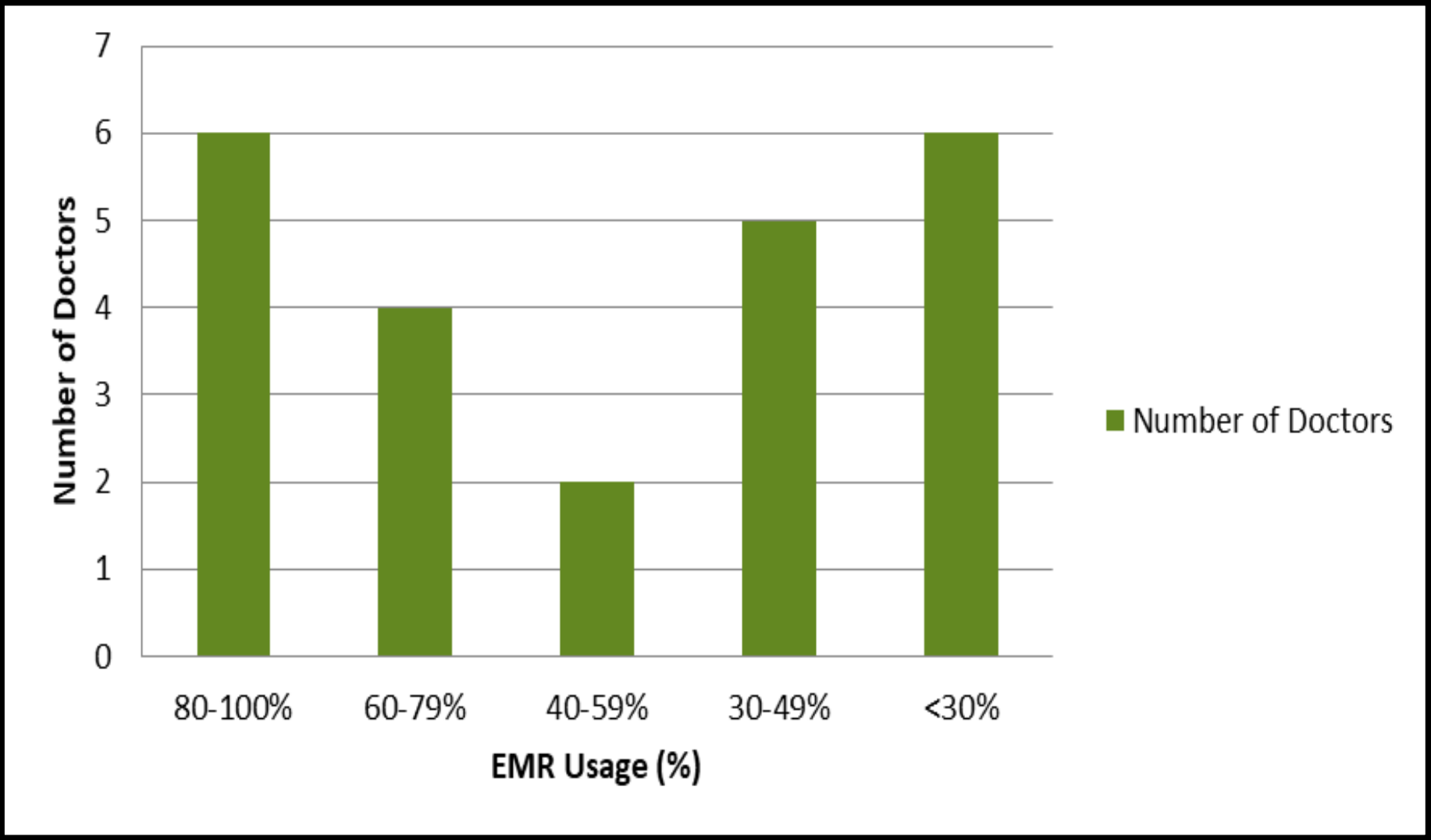
Despite training, 18% of doctors did not use EMR, revealing a significant post-training adoption gap.

Most consistent Department wise EMR -Completed Percentage



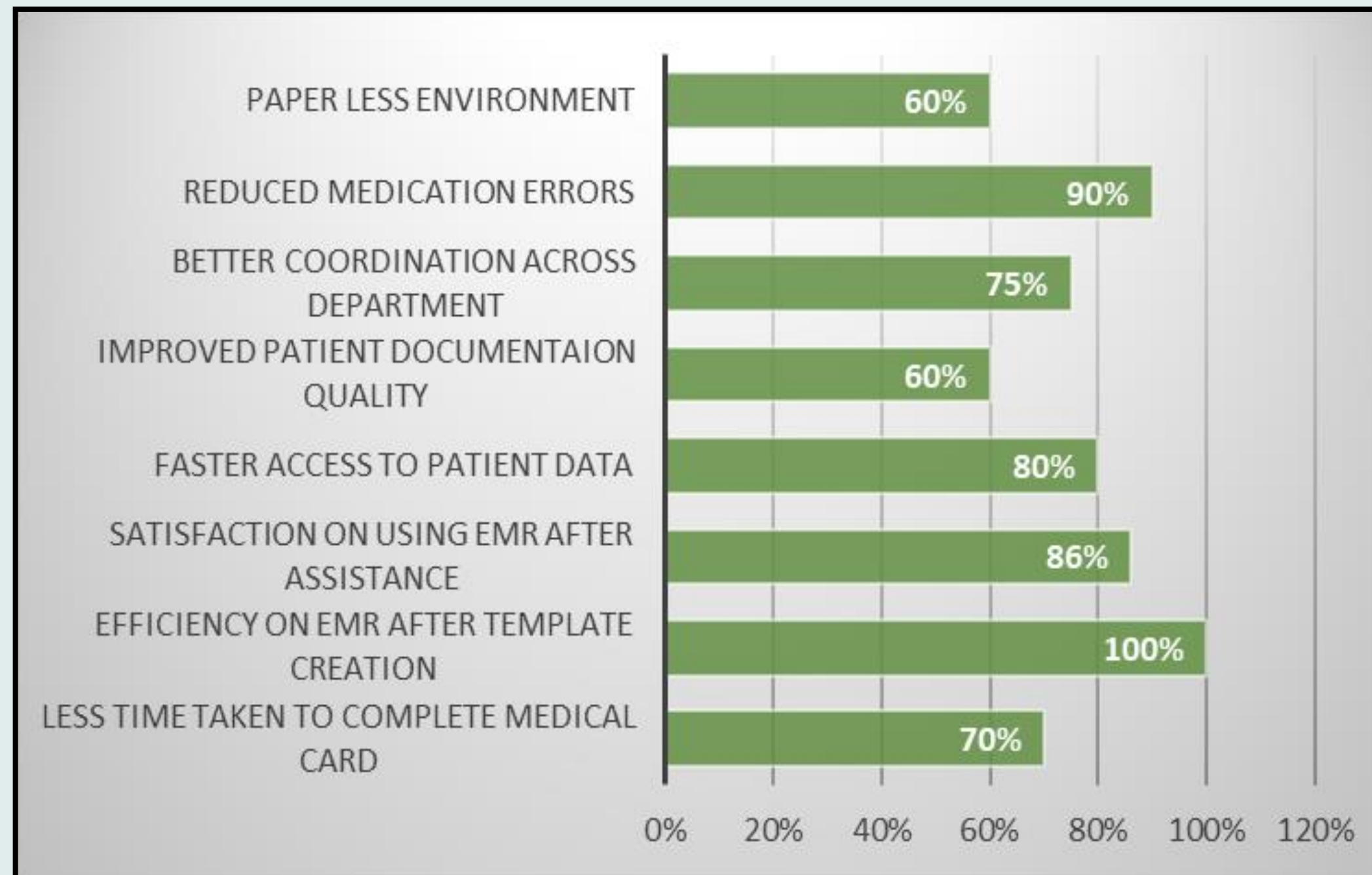
EMR completion rates vary widely by department, suggesting inconsistent adoption and need for department-specific interventions.

Number of Doctors by EMR Usage Percentage



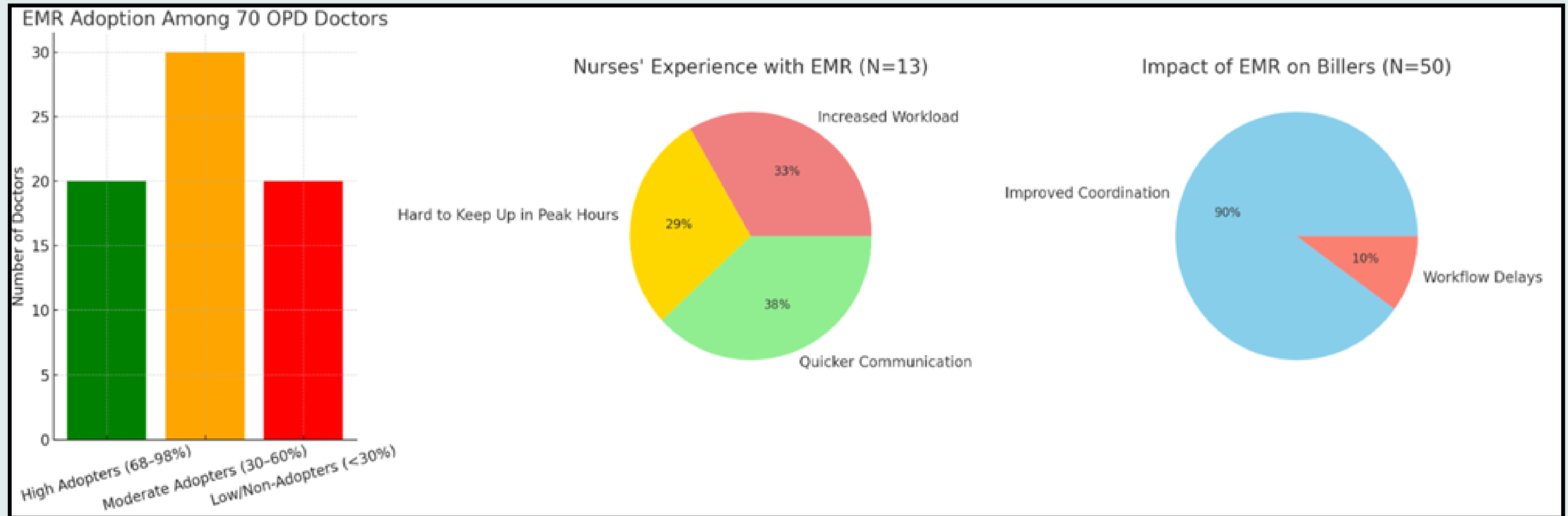
Doctors' usage is polarized, with some using EMRs heavily and others barely using them, reflecting unequal comfort and commitment.

Perceived Improvements after EMR Training and Assistance: Doctor Feedback%



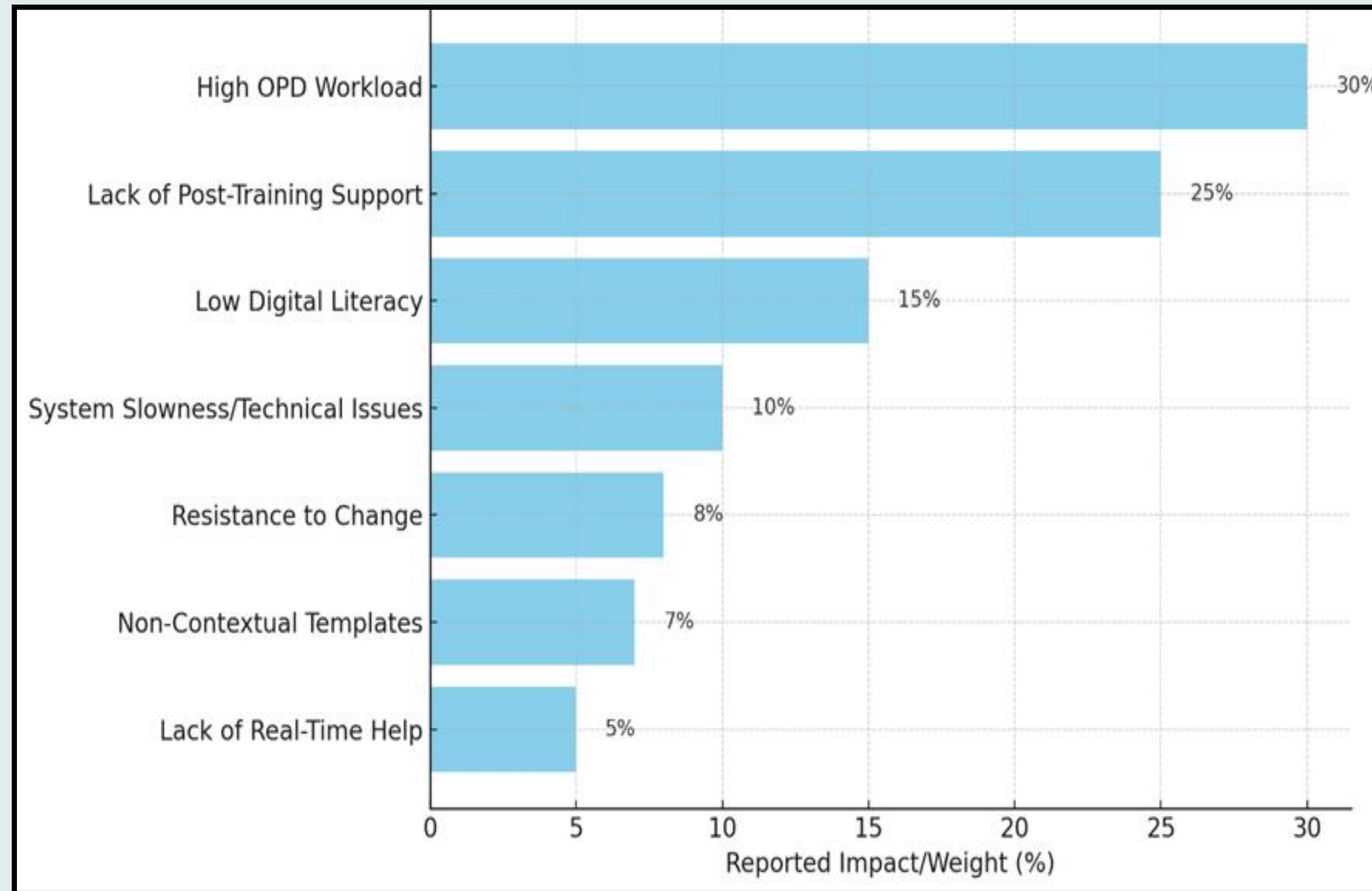
Doctors reported major gains in efficiency and reduced errors after receiving template support and hands-on assistance.

EMR experience among different users



While most users saw benefits in coordination and speed, nurses noted increased workload and billers cited occasional delays.

Reasons for Doctors Non-Engagement in EMR Usage



High patient load, poor usability, lack of ongoing support, and resistance to change were key barriers to EMR adoption.

Discussion

1. The EMR rollout led to moderate adoption, with only 42% of 20,015 outpatient entries fully completed. Departments like Cardiology, Pulmonology, and Pediatric Neurology saw high compliance (68–98%) due to leadership support and use of customized templates.
2. However, ENT, Gynaecology, Neurosurgery, and Physiotherapy lagged due to lack of engagement, digital resistance, and absence of tailored workflows. While training was provided to 50 doctors, 18% never used the EMR, reflecting that training alone was insufficient without real-time support.
3. Technical issues like system slowness, frequent logouts, and interface complexity were major deterrents. Departments that received real-time helpdesk assistance and workflow-specific templates outperformed others, highlighting the need for adaptive, user-centered design and cultural readiness for digital transformation.
4. Furthermore, user feedback showed that rigid template structures and excessive click paths interfered with patient interaction time, reinforcing behavioral resistance among clinicians. Peer influence and department-specific leadership were crucial; departments with digital champions recorded higher EMR usage.
5. Additionally, feedback from nurses and billers indicated improved coordination but also reported increased workload during high OPD volumes. These findings underscore that successful EMR integration extends beyond software—it must be a clinical-cultural shift supported by responsive IT, customized interfaces, and ongoing mentorship. Future EMR strategies must align with the clinical realities of each department to ensure consistent, long-term adoption.

Many doctors use certain phrases which can be represented as challenges.

Not user-friendly → *Still not user-friendly, even after multiple tries.*

Time-consuming → *Feels unnecessarily time-consuming for basic tasks.*

I spend more time on the screen than with the patient → *I end up spending more time on the screen than with the patient—exactly what I feared.*

Too many clicks – not intuitive → *Too many clicks—it’s just not intuitive to use.*

Entering vitals and orders takes more time than expected → *Entering vitals and orders takes longer than expected—everything feels delayed.*

The system crashes frequently / sometimes the system hangs or logs me out → *The system crashes frequently or hangs—sometimes even logs me out randomly.*

I still use both paper and EMR in parallel → *I’m still stuck using both paper and EMR at the same time—it’s chaotic.*

Templates are rigid – can’t write freely like on paper → *Templates are rigid—I miss the flexibility of writing freely like on paper.*

There was no proper training before implementation → *There was no proper training before they implemented it—we were just expected to figure it out.*

Tech people don’t understand clinical needs → *Tech people just don’t get what we need in a clinical setting.*

Good for documentation, bad for workflow → *Sure, it’s good for documentation—but terrible for real clinical workflow.*

I need a scribe or assistant to handle the EMR while I see patients → *Honestly, I need a scribe or assistant just to manage the EMR while I focus on the patient*

Templates

Add Annotation

Investigation Results

Investigation Results

Start writing...

Diagnosis

Diagnosis

DIAGNOSIS	TYPE	STATUS
There are no records to display		

Cancel

Save as Draft

Saha

Age: 45Y 4M 25D

A No Known Allergy

INIA

Delete

NIA

Delete

NAL HERNIA

Delete

Delete

Delete

CITIS

Delete

Delete

Delete

CESS

Delete

Delete

Systemic
Examination:

TENDERNESS RUQ / EPIGASTRIUM

Diagnosis:

Cholelithiasis



Prescription:

TABLET MEFTAL SPAS (MEFENAMIC ACID+DICYCLOMINE) 250MG+10MG
TABLET PANTOCID (PANTOPRAZOLE) 40MG

Investigation:

PROTHROMBIN TIME, PLASMA (3892-SRL)
GLUCOSE RANDOM, PLASMA (1302R-SRL)[1302R]
HEPATITIS B SURFACE ANTIGEN, SERUM (RAPID)(2470-SRL)

Use Template

Clinical Presentation

Clinical Presentation

PRESENTATION

DURATION

REMARK

There are no records to display

History of Clinical Presentation

≡

Patient History

Patient History Note 

This section will not appear on printout

Does patient have allergy? *

☐ Yes

☒ No known allergy

Allergy

Cancel

 Save as Draft



Mr. Naveen Kumar Agarwal

UHID: 13081064 Age: 59Y 3M 4D



Search Medication



Favorites



Prescription History

Search profile & medication name

Create New Prescription Favourites

MEDICATION NAME	DOSAGE	DURATION	INSTRUCTIONS
☐ TABLET VALENTAS (SACUBITRIL+VALSARTAN) 24MG+26MG	Oral - Twice A Day	Until Next Review	
☐ TABLET VALENTAS (SACUBITRIL+VALSARTAN) 49MG+51MG	1 TABLET Oral - Twice A Day	Until Next Review	
☐ TABLET ARNOZA (SACUBITRIL+VALSARTAN) 24MG+26MG	1 TABLET Oral - Twice A Day	Until Next Review	
☐ TABLET ARNOZA (SACUBITRIL+VALSARTAN) 49MG+51MG	1 TABLET Oral - Twice A Day	Until Next Review	
☐ TABLET ARNOZA-200 (SACUBITRIL+VALSARTAN) 97MG+103MG	1 TABLET Oral - Twice A Day	Until Next Review	
☐ TABLET ARNEY (SACUBITRIL+VALSARTAN) 24MG+26MG	1 TABLET Oral - Twice A Day	Until Next Review	
 Add Into Prescription Delete			

Cancel

EMR Implementation Feedback Questionnaire – For Doctors

Section A: Background Information

1. Department/Specialty: _____
2. Years of Clinical Experience:
☐ <1 year ☐ 1–3 years ☐ 4–6 years ☐ >6 years
3. Have you previously used any EMR system before this implementation?
☐ Yes ☐ No
4. Did you attend the EMR training sessions organized by the hospital?
☐ Yes ☐ No

Section B: EMR Training & Learning Curve

5. Did you receive training for EMR before its implementation?
☐ Yes ☐ No
6. Rate the quality of EMR training provided:
☐ Excellent ☐ Good ☐ Average ☐ Poor ☐ Not Applicable
7. Did the training prepare you well for daily clinical documentation using EMR?
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
8. How confident were you in using the EMR system after the training?
☐ Very Confident ☐ Somewhat Confident ☐ Neutral ☐ Not Confident
9. Did you face challenges while adapting to EMR in your daily routine?
☐ Yes ☐ No
If Yes, please specify: _____

Section C: Workflow & Clinical Impact

10. How has EMR affected the time you spend on clinical documentation?
☐ Reduced ☐ No Change ☐ Increased

11. Do you feel EMR has improved the accuracy of clinical notes and prescriptions?
☐ Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree
12. Has EMR made it easier to access patient history, labs, and investigations?
☐ Yes ☐ No ☐ Partially
13. Has EMR improved communication with other departments (e.g., radiology, pharmacy)?
☐ Yes ☐ No ☐ Not Sure
14. Do you find the EMR interface intuitive for entering clinical information?
☐ Very Easy ☐ Easy ☐ Neutral ☐ Difficult ☐ Very Difficult
15. Are there any clinical tasks that have become more time-consuming with EMR?
☐ Yes ☐ No
If Yes, please specify: _____

Section D: Satisfaction, Support & Suggestions

16. Overall, how satisfied are you with the EMR system?
☐ Very Satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very Dissatisfied
17. Do you feel EMR has contributed to better patient care outcomes?
☐ Yes ☐ No ☐ Not Sure
18. Do you receive timely IT support when facing technical issues with EMR?
☐ Always ☐ Often ☐ Sometimes ☐ Rarely ☐ Never
19. Would you recommend any improvements in EMR training for doctors?
20. What features would you like added or improved in the current EMR system?
21. Additional feedback or observations regarding EMR usage in clinical practice:

Recommendations

Short-Term Recommendations (0-3 Months)

Recommendation	Explanation
Conduct monthly EMR orientation refreshers	Helps reinforce training and address specific user concerns post-implementation.
Provide real-time IT support during OPD hours	Ensures immediate troubleshooting during peak usage times.
Use simplified, department-specific Customized templates for OPD documentation	Reduces unnecessary input fields and streamlines note entry for faster documentation.

Mid-Term Recommendations (3-6 Months)

Recommendation	Explanation
Add multiple tab viewing within a single EMR page	Improves navigation and efficiency by allowing users to view lab reports, notes, and prescriptions simultaneously.
Improve EMR font sizes and color contrast across modules	Enhances readability and user comfort, especially for senior clinicians.
Ensure seamless login/logout and auto-save features	Prevents session timeouts and data loss, enhancing user confidence.
Conduct quarterly EMR usage audits by department	Tracks usage, identifies low-adoption areas, and facilitates targeted improvement efforts.
Launch dashboards with doctor-wise EMR usage and completion rates	Encourages accountability and visualizes progress department-wise.
Improve system responsiveness through hardware and internet upgrades	Reduces lag and improves doctor satisfaction during documentation.
Organize peer-led EMR training workshops in each department	Fosters adoption through trusted peer support and department-specific demonstrations.
Enable in-EMR user feedback collection pop-up	Gathers real-time insights into usability and system issues for iterative improvements.
Integrate EMR use into performance reviews for consultants	Encourages regular use by making EMR part of formal evaluation.

Long-Term Recommendations (7-12 Months)

Recommendation	Explanation
Introduce EMR stylus pens to OPD consultants	Supports better touchscreen interaction and speeds up handwritten notes capture.
Introduce voice-assisted dictation for EMR documentation	Reduces typing workload and supports faster data entry in OPDs.
Assign EMR champions in every department	Provides ongoing support, drives adoption, and bridges gaps between IT and clinical workflows.
Integrate AI-based clinical decision support in EMRs	Offers alerts, drug interactions, and diagnostic suggestions for safer and faster care.
Redesign EMR interface annually based on usability feedback	Ensures the system remains intuitive, modern, and aligned with clinical needs.
Standardize EMR Customizable templates across hospital branches	Supports data consistency and enhances inter-facility coordination.
Develop mobile/tablet-based EMR documentation interface	Enables bedside documentation, improving real-time data capture and reducing retrospective entries.

Strengths and Limitations of the Study

Strengths:

- **Large sample size of 20,015 outpatient records analyzed post-EMR rollout, providing a comprehensive quantitative foundation.**
- **Inclusion of 50 real-time observed doctors across departments for behavioral insights.**
- **Mixed-method approach allowed triangulation between data usage patterns and clinician feedback.**
- **Practical, real-world setting in a high-volume tertiary care hospital, enhancing the study's external validity.**

Limitations:

- **Short study period (2 months) limited the ability to assess long-term adoption trends or system sustainability.**
- **Focused primarily on doctors; excluded in-depth data from nurses, administrative staff, and patients.**
- **No baseline data pre-EMR rollout, making it difficult to compare progress against historical benchmarks.**

Study restricted to OPD Department.(First phase)

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THANK YOU