

TO ENHANCE NURSING WORKFLOW: ASSESSING CHALLENGES AND IMPROVIZATION WITH THE NAMAH APPLICATION

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Master of Business Administration (MBA)

in

Hospital and Health Management

By

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Under the Supervision and Guidance of

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2024

Certificate of Successful Completion of Internship

To whomsoever it may concern

Ms. Ragini Kishor Dod has completed her internship in athmâ, at the Software Development Centre, Narayana Health, Bangalore, in the period of **1st April 2024 to 28th June 2024**.

During her internship, she worked with the Product team, and her project was **"To Enhance Nursing Workflow: Assessing Challenges and Improvisation with The Namah Application"**.

Ragini's contributions include:

1. The key characteristics of the Namah app and its positive impact on the efficiency of the workforce utilizing the app in terms of turnaround times.
2. The existing constraints that need to be addressed over time to enhance patient care.
3. Input from users regarding their experience with the app.

Her performance is satisfactory, and we wish her the best for her future endeavors.

Yours faithfully,

for **Narayana Hrudayalaya Limited.**,


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DECLARATION BY STUDENT

I hereby declare that this dissertation titled **To enhance Nursing Workflow: Assessing Challenges and Improvisation with the NAMA Application** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

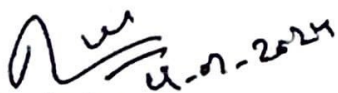

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Name of Student

Date: 4/07/24

CERTIFICATE

This is to certify that dissertation titled. **To Enhance nursing workflow assessing challenges and improvisation with the NAMA application** is a record of the research work undertaken by RAGINI DOD in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.


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ABSTRACT

The NAMAHA application represents a pivotal innovation in healthcare technology aimed at enhancing nursing efficiency and patient care documentation. Developed to streamline various nursing tasks, NAMAHA integrates features such as vital signs recording, patient handover, task management, and digital forms, all designed to optimize workflow and improve accuracy in clinical settings. This project evaluates the implementation and impact of NAMAHA across multiple healthcare facilities, focusing on user satisfaction, usability, and efficiency gains. Through quantitative analysis and user feedback, the study examines how NAMAHA has transformed nursing practices, reducing documentation time, improving patient handover processes, and enhancing overall workflow efficiency. Key findings highlight high user satisfaction with the application's user-friendly interface and the significant reduction in time spent on manual tasks compared to traditional paper-based methods. The project also identifies areas for further enhancement, including the integration of additional features and addressing usability challenges. Ultimately, NAMAHA emerges as a pivotal tool in modern healthcare, facilitating smoother operations and contributing to enhanced patient care outcomes.

Objectives:

Objective No. 1: To understand the challenges face by the nurses andhow namah is contributing to overcome these challenges

Objective No. 2: To identify the existing gaps in Namah's functionalityand workflow from the users perspective.

Methodology:

The methodology of the study involves conducting a structured surveyamong nurses at Narayana Health to assess their experience with the NAMAHA application. The survey will utilize a combination of closed-ended questions with rating scales to measure user-friendliness, satisfaction levels,and adequacy of training received on NAMAHA usage. Open-ended questionswill be used to gather qualitative insights on the specific features of NAMAHAthat nurses find most helpful or challenging for documentation purposes.

Results: Based on the data analysis and user feedback gathered from the NAMAHA project, several key findings highlight the application's impact on nursing efficiency and user satisfaction. The majority of respondents, primarily in the 20-30 age group comprising 62%, reported high satisfaction with NAMAHA's user-friendly interface, rating it an average of 3.96 out of 5. The Patient Handover feature emerged as most critical, with 50% of users finding it invaluable for seamless shift transitions, followed closely by Vital signs recording (34%) spending less than 1 minute entering patient vitals using NAMAHA, compared to 19.3% with paper methods. Similarly, for nursing progress notes, 69.9% completed documentation in under 2 minutes with NAMAHA, compared to 17.4% with paper. Patient handover times were drastically reduced, with 52.7% completing the process in just 30 seconds using NAMAHA, compared to 15.9% with paper-based methods. Overall, these results underscore NAMAHA's role in enhancing workflow efficiency, reducing documentation time, and improving communication among healthcare teams, thereby positively impacting patient care delivery.

Discussion: The implementation and user feedback of the NAMAHA application offer compelling insights into the integration of digital technologies in healthcare. The project highlights NAMAHA's positive impact on efficiency and Task management (32%). While 98% of users received adequate training, challenges were noted with features like the I/O Chart, found difficult by 41% due to its detailed nature. Efficiency gains were significant, with 84.9%

user satisfaction among nursing professionals, evidenced by high ratings for user-friendliness and significant time savings in tasks like patient vitals entry and nursing progress notes documentation compared to traditional methods. However, challenges such as usability issues with features like the I/O Chart and application loading delays underscore the importance of ongoing research and development. Future efforts should focus on enhancing user experience, expanding functionalities to include ICD drainage sheets and daily skin monitoring forms, and addressing technical barriers to ensure seamless adoption and sustained use of digital healthcare solutions like NAMAHA. These findings contribute to advancing the integration of technology in healthcare, aiming to optimize workflows, enhance patient care, and meet the evolving needs of healthcare providers across diverse clinical settings.

Conclusion: The introduction of the Nursing Automation and Medical Administration Hub (NAMAHA) app presents a comprehensive solution to streamline documentation processes, enhance efficiency, and reduce burnout risks among nurses. By providing a digital platform for recording vital patient information, facilitating communication between healthcare professionals, and optimizing task management, the NAMAHA app aims to alleviate the burden on nurses and promote a sustainable work environment conducive to delivering exemplary cardiac care. The objectives of NAMAHA focus on enabling nurses to spend more time on patient care by minimizing documentation tasks, reducing physical strain through streamlined access to patient information, empowering nurses digitally with mobile access, and ensuring secure storage of patient records.

Keywords: NAMAHA application, Digital technologies in healthcare, User satisfaction, Efficiency, User-friendliness, Time savings, Nursing professionals, Healthcare workflows, cross-sectional study.

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Last but certainly not least, a sincere thank you to all the participants who had kindly given their time and shared their experiences with the survey. Their cooperation was indispensable for the completion of this study, and I appreciate it greatly. I thank my parents & friends for their continuous support & motivation. I perceive this internship as a vital part of my professional development.

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Ragini Dod MBA- HM27

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ABBREVIATIONS

NAMAH	Nursing Automation and Medical Administration Hub
MAR	Medication Administration Record
CCU	Critical Care Unit
AITU	Advanced Intensive Therapy Unit
EHR	Electronic Health Record
HIPAA:	Health Insurance Portability and Accountability Act
EMR	Electronic Medical Record
ICU	Intensive Care Unit
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
CPOE:	Computerized Physician Order Entry
HIT	Health Information Technology
WHO	World Health Organization
FDA	Food and Drug Administration
(MEWS	Modified Early Warning Score
PEWS	Pediatric Early Warning Score
I/O charts	Intake and outtake chart
ICD	Implantable Cardioverter Defibrillator

CHAPTER 1: INTRODUCTION

NAMAH

(Nursing Automation and Medical Administration Hub)

Nursing Automation and Medical Administration Hub (NAMAH) app, a mobile application designed to streamline and optimize documentation processes for the nursing staff at Narayana Health. In response to the formidable challenge of documentation workload faced by nurses, the NAMAH app offers a comprehensive solution aimed at enhancing efficiency and reducing burnout risks by providing paperless vitals recording, nurses can effortlessly input and access patient data, including previous medical history, laboratory reports, radiology scans, and medication details, all within a centralized digital platform. Moreover, the app facilitates various assessments such as pain assessment, skin assessment, and cardiovascular assessment, ensuring thorough documentation without added administrative burdens.

One of its key features includes facilitating quick and accurate handovers to the next shift nurse, promoting seamless continuity of care and minimizing communication errors. With the NAMAH app, nurses at Narayana Health can significantly streamline documentation processes, allowing them to allocate more time to direct patient care and ultimately fostering a sustainable work environment conducive to delivering exemplary cardiac care.

NAMAH Features

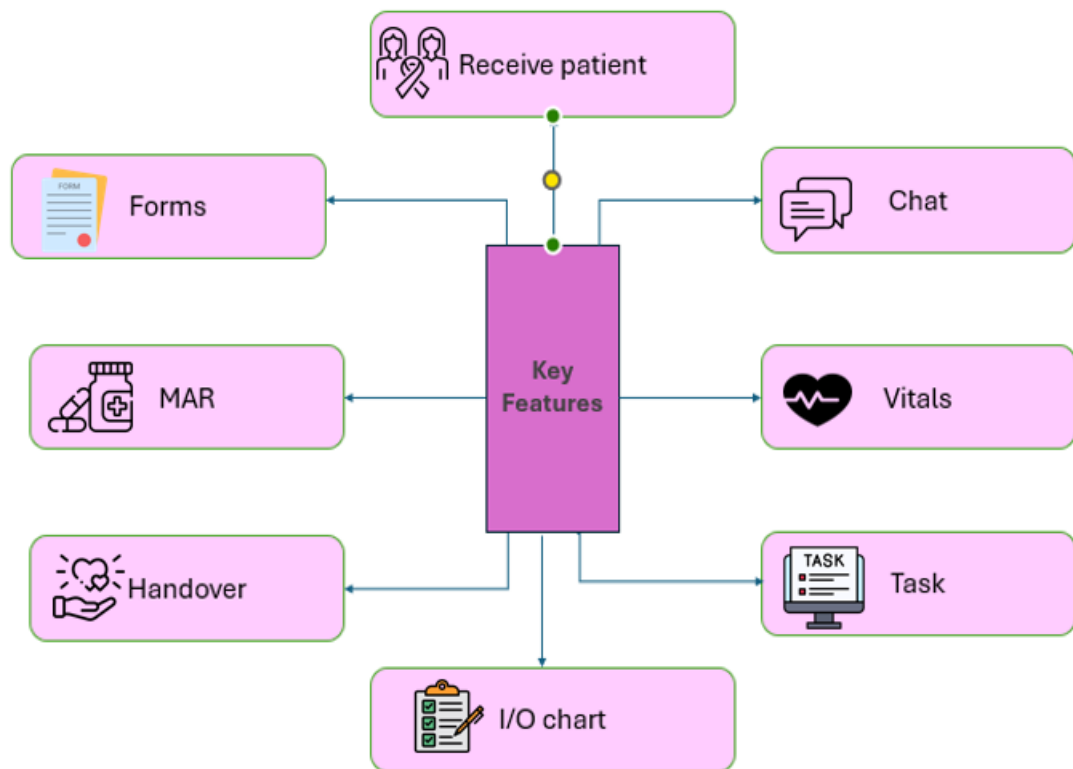


Figure 1: NAMAH Features

Receive Patients: This functionality empowers nurses to efficiently admit new patients to the ward. Like the feature found in the ATHMA platform within the ADT module's "Nursing Station" section, nurses can effortlessly accept patients by scanning their barcodes. This streamlined process significantly alleviates the nurse's workload and reduces the time required to process new patient admissions to the ward.

Tasks : This functionality enables nurses to create and manage tasks, providing them with a helpful reminder system. Nurses can input task details such as date, time, task title, priority, and set up alerts for timely notifications. This feature proves invaluable in alleviating the mental burden on nurses, ensuring they can easily recall and fulfill their assigned tasks, even in demanding and stressful environments.

Chat : NAMA App boasts a highly beneficial feature that streamlines communication between nurses and physicians, enhancing patient care efficiency. This integrated feature enables nurses to directly text physicians within the app, fostering swift communication for patient care activities.

Seamless integration with the AADI App ensures a cohesive and comprehensive healthcare platform.

Vitals: The Vitals Assessment feature in the NAMA App empowers nurses to swiftly record comprehensive patient vital details in a matter of minutes, offering a significant improvement over traditional paper-based method.

Retaining the familiar parameters utilized in conventional systems, this digital feature enhances convenience and expedites the documentation process, ensuring accuracy and efficiency.

Forms: Within the NAMA App, nurses can seamlessly conduct a myriad of assessments digitally, revolutionizing the traditional paper-based approach. This innovative feature encompasses assessments such as the Glasgow Coma Scale (GCS), Skin Assessment, Genitourinary Assessment, Respiratory Assessment, Cardiovascular Assessment, Neurological Assessment, Pain Assessment, Gastrointestinal Assessment, and more.

This digital transformation addresses several challenges associated with conventional methods, including time consuming processes, difficulties in storage, limited accessibility, security concerns, and potential inaccuracies. By transitioning to a digital format, the app not only expedites the assessment process but also offers advantages in terms of secure storage and easy accessibility. The digital platform ensures the accuracy of recorded data, eliminating the risk of manual errors and enhancing the overall quality of patient care. Moreover, the app provides a valuable feature of tracking assessment trends over time as all completed forms are recorded and displayed under the forms feature of the NAMA App.

Handover: The NAMA App's Handover feature revolutionizes the shift transition process for nurses, significantly streamlining and expediting it compared to the cumbersome paper-based documentation method. In just a few minutes, nurses can efficiently complete the handover process, ensuring a seamless transfer of patient care responsibilities. To facilitate this, the nurse simply selects the colleague to whom they are handing over the patient.

The feature includes a user-friendly question-and-response form, mirroring the parameters of the conventional paper-based handover form. In addition to the standard details, nurses have the flexibility to input their nursing notes and provide specific instructions for the incoming nurse. This comprehensive approach ensures that critical information is transferred accurately, enhancing communication and continuity of care.

MAR: The MAR feature in NAMA App offers nurses a streamlined and efficient way to request medications from the pharmacy without the need for physical prescriptions or visits.

It includes Features: Medication Indent, Medication Acknowledgement.

I/O Chart; Intake and Output (I/O) charts are vital tools used by nurses for meticulous documentation of a patient's fluid balance in medical settings. The chart meticulously records all sources of fluid intake, including oral fluids, intravenous fluids, tube feedings, and medications, along with various outputs such as urinary excretion, stool output, vomitus, and drainage. Each entry is meticulously timestamped to track when fluids are administered or eliminated, typically measured in milliliters for accuracy. These charts are essential for monitoring changes in fluid status, detecting early signs of dehydration or fluid overload, and facilitating effective communication among healthcare providers regarding a patient's fluid management needs.

They serve as a cornerstone in ensuring patients receive appropriate hydration and therapeutic interventions tailored to their individual health conditions.

1.1: Research problem:

The nursing staff encounters a formidable challenge concerning the documentation workload. Amidst the hospital's dynamic clinical environment, characterized by a substantial caseload of cardiac surgeries and critical procedures, nurses shoulder the responsibility not only of delivering meticulous patient care but also of maintaining comprehensive documentation. This documentation burden is further intensified by the imperative for precise record-keeping to uphold quality care standards and meet stringent regulatory requirements. Consequently, nurses face heightened pressures to allocate significant time and attention to documenting patient assessments, treatment plans, medication administration, and vital signs accurately. The cumulative effect of these demands poses a tangible risk of burnout among the nursing staff.

1.2: Objectives

Objective No. 1: To understand the challenges face by the nurses and how namah is contributing to overcome these challenges.

Objective No. 2: To identify the existing gaps in Namah's functionality and workflow from the perspective of its users.

1.3: Aim

The aim of this study is to investigate how the NAMAHA app helps nurses at Narayana Health handle their heavy workload of documenting patient care length of the patient stay. We want to understand the challenges nurses face with documentation and how NAMAHA makes their job easier.

The study also looks at any issues users have with NAMAHA's features and workflow to find ways to improve it. we hope to find ways to make NAMAHA more helpful and make sure nurses can focus more on patient care and less on paperwork.

CHAPTER 2: REVIEW OF LITERATURE

S. No	Author and Year	Title/ Objectives of the study	Study	Key Findings
1.	Pan Minghao1* and GaoWei (12 march 2022)	Determinantsof the behavioral intention to use a mobile nursing application by nurses in China	Cross-sectional	1.Study examinedwhat factors influence nurses’behavioral intention of a mobile nursing app.
		.		2 . A s expected, performance expectancy, social influence, facilitating condition, self-efficacy and perceived incentives had a positive significant effect on nurses’ behavioral intention to use a mobile nursing app.
2.	Smith etal., (2020)	Impact of Mobile Health Applications on Nursing Efficiency: Systematic Review"	Cross-sectional	1 . Mobile healthapplications were found to generally improve nursing efficiency by reducing documentation time, enhancing access to patient information, and facilitating communication among health care teams.

				However, challenges such as usability issues and integration complexities were noted, highlighting the need for tailored implementation strategies and ongoing support.
3.	Lee and Kim, 2018	Adoption of Mobile Health Technology in Healthcare: This review examines that factor influencing the adoption of mobile health technologies including adaption of mobile health technologies including mobile applications among healthcare professionals .	Cross-sectional	1. Factors such as perceived usefulness, ease of use, technical support, and organizational readiness significantly influence the adoption and sustained use of mobile health technologies. 2. Successful adoption is associated with improved patient care outcomes, 3. Enhanced communication and streamlined clinical workflows.

4.	Wang et al., 2020	Usability of Mobile Applications in Healthcare: This systematic review evaluates the usability aspects of mobile Applications used in healthcare, focusing on user Experience and interface design.	Cross-sectional	1. Usability issues such as complex interfaces, lack of training, and technical glitches can hinder the effective use of mobile applications by healthcare professionals. 2. Improving usability through user-centered design and iterative testing are crucial for enhancing adoption and optimizing the impact of mobile applications on patient care.
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5.	Li et al., 2021	Factors Influencing Nurses' Adoption of Mobile Health Applications: This review investigates the factors influencing nurses' adoption of mobile health applications, focusing on behavioral determinants and organizational factors.	Cross-sectional	1. Key determinants influencing nurses' adoption include perceived usefulness, ease of use, training and support, organizational policies, and compatibility with clinical workflows. 2. Addressing these factors is essential for promoting the effective adoption and sustained use of mobile health applications among nurses, ultimately enhancing patient care outcomes.
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CHAPTER 3: METHODOLOGY

3.1: Research Methodology

The methodology of the study involves conducting a structured survey among nurses at Narayana Health to assess their experience with the NAMAHA application. The survey will utilize a combination of closed-ended questions with rating scales to measure user-friendliness, satisfaction levels, and adequacy of training received on NAMAHA usage. Open-ended questions will be used to gather qualitative insights on the specific features of NAMAHA that nurses find most helpful or challenging for documentation purposes. Additionally, questions will inquire about the time taken by nurses to enter nursing progressive notes and perform patient handovers using NAMAHA.

The survey will be distributed in the form of Microsoft forms by generating a QR Code to ensure ease of access and timely responses from a representative sample of nurses across different wards or departments within Narayana Health. Participation will be voluntary and anonymous to encourage honest feedback. Data analysis will involve quantitative methods such as descriptive statistics to summarize ratings and time taken for documentation tasks.

3.1.1 Research Question:

- Q1. How user-friendly is the NAMAHA application perceived to be by nurses at Narayana Health?
- Q2. What are the challenges faced by nurses and what are their improvisations that can be done to overcome the limitations.

3.1.2 Study Design: Cross-sectional study.

3.1.3 Type of study: Primary Research

3.1.4 Study Setting:

This study was conducted in the Narayana health, Bangalore.

NH Two units-

**Narayana institute of cardiac sciences (NICS),
International wing.**



3.1.5 Research Procedures/Approach:

The research procedures and approach undertaken for the NAMA project involved a comprehensive and structured methodology aimed at evaluating the application's impact on nursing practice and user satisfaction. Surveys were distributed among nursing staff to quantify user perceptions regarding NAMA's usability, efficiency, and overall satisfaction. These surveys included Likert-scale questions to gauge user experiences with different features such as patient handover, vitals recording, and nursing progress notes. Open-ended questions provided qualitative insights into specific challenges faced and suggestions for improvement.

Table 3.1: Overall description of the sample selected from each Department.

SR.NO	DEPARTMENT	ACTIVE COUNT	SAMPLE TAKEN
1.	1 st Floor Ward	17	5
2	2 nd Floor Ward	21	4
3	3th Floor Ward	28	3
4	4 th floor Ward	24	4
5	5 th Floor A Ward	36	4
6	5 th Floor B Ward	58	5
7	6 th Floor Ward	43	4
8	AITU-1 ST Floor	108	8
9	AITU-2 nd Floor	139	5
10	AITU-4 th Floor	44	7
11	AITU-6 th Floor	38	9
12	International Wing	57	13
13	CCU	117	28

3.1.6 Study Populations:

All the 730 identified Nurses from the NICS block and International wing who have been using NAMAHA application.

3.1.7 Sample Size:

The total sample Size of the study is 140 nurses. Sample includes nurses from various department and wards at Narayana Health, encompassing both general wards and specialized units such as the Advanced Intensive Therapy Units (AITU), International Wing, and Critical Care Unit (CCU). Each department or unit contributed a specific number of nurses to the total sample, reflecting the diversity of roles and responsibilities within the healthcare facility.

3.1.8 Study Tools: Structured questionnaires, interviews, focus group discussions, and surveys.

3.1.9 Duration of study: 3 months

3.1.10 Sampling Technique:

Simple random sampling was done

3.1.11 Data Analysis Plan:

- **Software:** Statistical analysis will be conducted using EXCEL, MICROSOFT FORM.
- **Descriptive Statistics:** Descriptive statistics will be used to summarize the characteristics of the study sample, dataset, percentages, visualization and summarization, Qualitative analysis.

3.1.12 Data Collection and Management:

In evaluating the NAMAHA application at Narayana Health, the data collection involves structured surveys to gather both quantitative and qualitative feedback from nurses. The approach towards sampling method ensures diverse departmental representation, including CCU and specialized units, to capture comprehensive perspectives. Ethical considerations, such as informed consent and confidentiality, are strictly followed to protect participant privacy.

This includes Statistical software supports descriptive analysis to identify user perceptions and trends, guiding strategic improvements to enhance NAMAHA's usability and effectiveness in patient care at Narayana Health.

3.2 Hypothesis:

Cross-sectional study:

- **Null Hypothesis (H0):** There is no significant difference in nurses' perceived challenges before and after implementing the NAMAHA application at Narayana Health.
- **Alternative Hypothesis (H1):** There is a significant improvement in nurses' ability to manage documentation workload and enhance patient care after implementing the NAMAHA application at Narayana Health.
- **Null Hypothesis (H0):** There is no significant perception of gaps in NAMAHA's functionality and workflow among its users at Narayana Health.
- **Alternative Hypothesis (H1):** There are significant gaps perceived in NAMAHA's functionality and workflow among its users at Narayana Health.

3.3 **Operational Definitions:**

- **EHR Integration**

EHR integration is the process of enabling medical record to be accessed across electronic software solutions. This means that medical records with personal information, medical history, and other related clinical and claims data are aggregated within a centralized location.

- **Medication Administration**

Medication administration: the direct application of a prescribed medication—whether by injection, inhalation, ingestion, or other means—to the body of the individual by an individual legally authorized to do so.

- **Regulatory Compliance**

Regulatory compliance is an organizations adherence to law, regulations, guidelines, and specifications relevant to its business processes.

- **Quality care standard**

Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes.

- **Streamlined Documentation**

A streamlined documentation process ensures that all stakeholders have access to the same information. This can help to improve communication between team members, reduce the risk of errors, and ensure that everyone is on the same page.

Centralized digital platform

Centralized systems are systems that use client/server architecture where one or more client nodes are directly connected to a central server.

3.4 Ethical Considerations:

Informed Consent:

Before participation in the study, all participants will be provided with detailed information about the purpose, procedures, risks, and benefits of the study. Informed consent will be obtained from each participant, ensuring that they understand their voluntary participation and their right to withdraw from the study at any time without consequence.

Protection of Participant Confidentiality:

Measures will be implemented to protect the confidentiality and privacy of participants. Data collected will be anonymized and stored securely, with access limited to authorized research personnel only. Participants will be assured that their responses will be kept confidential and will not be shared with anyone outside of the research team.

Voluntary Participation:

Participation in the study will be entirely voluntary, and participants will not face any coercion or pressure to participate. They will be informed that they can decline to participate or withdraw from the study at any point without consequence.

Respect for Cultural Sensitivities:

The study will be conducted with sensitivity to the cultural norms, beliefs, and practices of the communities involved, particularly considering the diverse backgrounds of migrant workers. Researchers will seek to build rapport and trust with participants, respecting their cultural traditions and preferences throughout the research process.

CHAPTER 4: RESULTS

4.1 Age form analysis:

18-20 years old: This age group makes up 28% of the respondents. These individuals are likely younger, possibly including nursing students or early-career nurses who are starting out in their profession. **20-30 years old:** The largest group at 62%, this age range represents most respondents. These individuals are likely to be early to mid-career nurses who are actively engaged in patient care and are the primary users benefiting from the NAMAHA app's features.

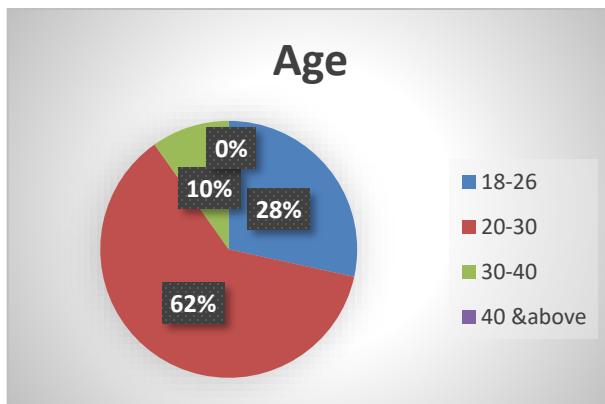


Figure 4.1.1: Age Group of Respondent (nurses)

Age group	Respondent	Percentage%
18-26	29	28%
20-30	63	62%
30-40	10	10%
40 & above	0	0%

30-40 years old: This group constitutes 10% of the respondents. They may include more experienced nurses who have been in the profession for some years and are adapting to new technologies like the NAMAHA app. **40 years and above:** According to the data, there were no respondents in this age group. This could indicate either a lack of older nurses using the app, or it might reflect a demographic trend within the specific context of the study.

4.2 Years of Nursing Experience

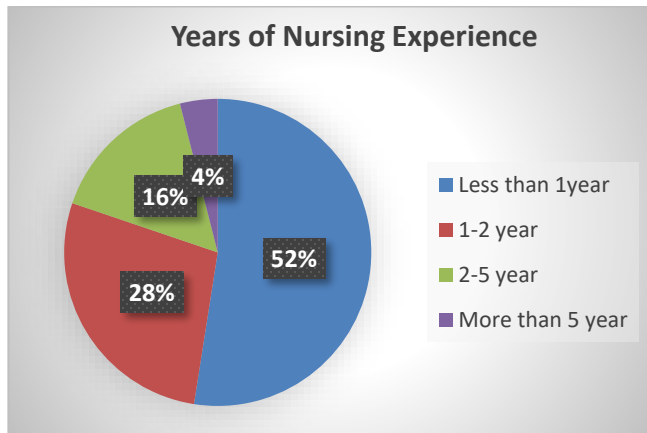


Figure 4.2.1: Year of Nursing Experience

Less than 1 year: 52% of respondents have less than 1 year of experience. These are likely new nurses who are early in their careers and are adapting to tools like the NAMAHA app as they start their professional journey.

1-2 years: 28% of respondents have between 1 to 2 years of experience. They are still relatively early in their careers but may have more familiarity with nursing practices and digital tools compared to those with less experience.

2-5 years: 16% of respondents have between 2 to 5 years of experience. These nurses are gaining more experience in patient care and may have encountered various documentation challenges that the NAMAHA app aims to address.

More than 5 years: 4% of respondents have more than 5 years of experience. These are likely more seasoned nurses who have been in the field longer and may have adapted to traditional documentation methods.

4.3 How user-friendly do you find the Namah application?

This bar chart visually represents the distribution of user ratings regarding the user-friendliness of the Namah application. It shows that most users (71% as mentioned) rated the application between 4 and 5, indicating a high level of satisfaction with its user-friendliness.

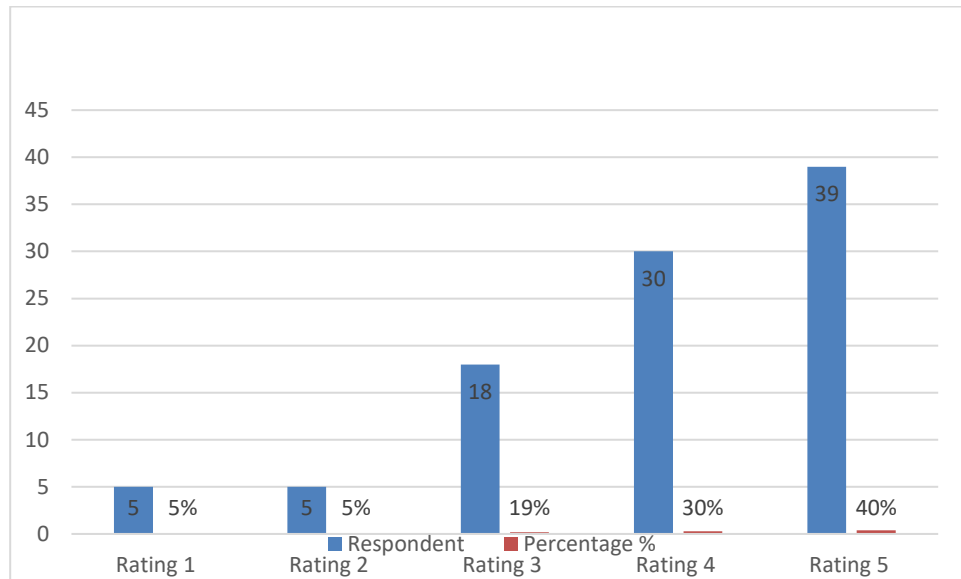


Figure 4.3.1: User Friendly NAMAH application.

Rating	Respondent	Percentage %
Rating 1	5	5%
Rating 2	5	5%
Rating 3	18	19%
Rating 4	30	30%
Rating 5	39	40%

Average Rating	3.96
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Total Average Rating

The average rating of **3.96** indicates that, on average, users rated the user-friendliness of the Namah application close to 4 (which corresponds to a positive rating). This suggests that most users find the application quite user-friendly, as the average rating is approaching the higher end of the rating scale (which ranges from 1 to 5).

The distribution of ratings shows that while there were a few lower ratings (1 and 2), the bulk of responses were higher (3, 4, and 5), indicating a generally positive perception of the app's user-friendliness among the respondents. This average rating helps gauge overall satisfaction with the application's usability and user interface, reflecting how well it meets the needs and expectations of its users in terms of ease of use and navigation.

4.4: Most Help full Feature

The Patient Handover feature stands out as the most critical for ensuring smooth transitions and communication between nursing shifts, as indicated by the highest percentage of respondents

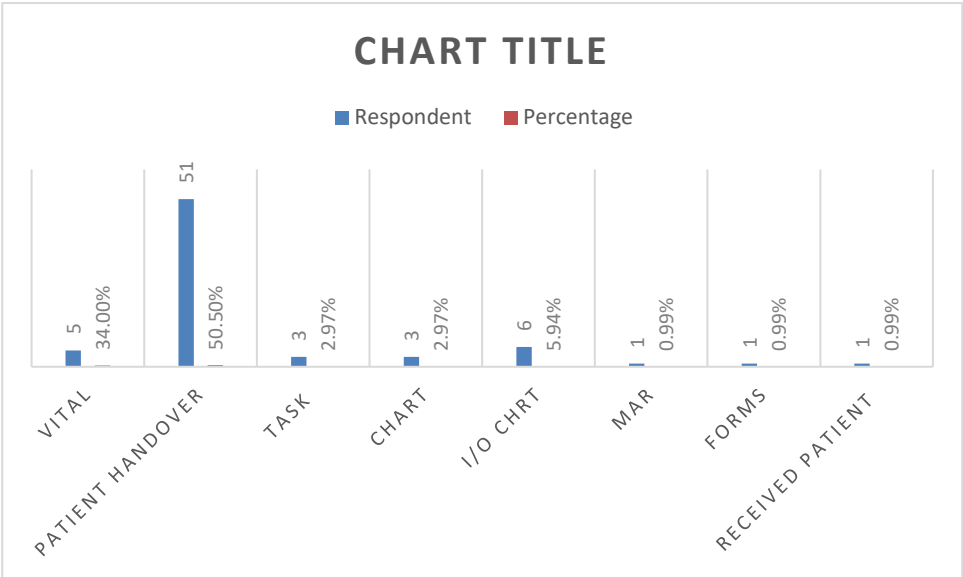


Figure 4.4.1: Most Helpful Feature

Vital signs recording, task management, communication (via chat), and specific documentation tools like I/O charts and MARs also play significant roles in facilitating efficient and accurate patient care documentation.

Vital: Respondents: 34%

The Vital feature is considered most helpful by 34% of respondents. This feature likely enables nurses to record and access vital signs such as blood pressure, pulse rate, temperature, etc., digitally.

Patient Handover: Respondents: 50%

The Patient Handover feature is highly valued, with 50% of respondents finding it most helpful. This feature facilitates the transfer of patient information between nursing shifts, ensuring continuity of care.

Task: Respondents: 32%

The Task feature is identified as helpful by 32% of respondents. This feature likely includes functionalities for assigning and tracking nursing tasks and responsibilities, ensuring that all patient care tasks are managed efficiently and effectively. Functionalities for assigning and tracking nursing tasks and responsibilities.

Received Patient: Respondents: 1%

The Received Patient feature is considered helpful by 1% of respondents. This feature may involve documenting information when a patient is admitted or transferred into the care of the nursing staff, ensuring that all necessary details are recorded for continuity of care.

4.5 : Adequate training

Yes, I received adequate training: 98% of respondents indicated that they received adequate training on how to use the Namah application. This high percentage suggests that the majority of users feel well-prepared to utilize the application effectively in their work.

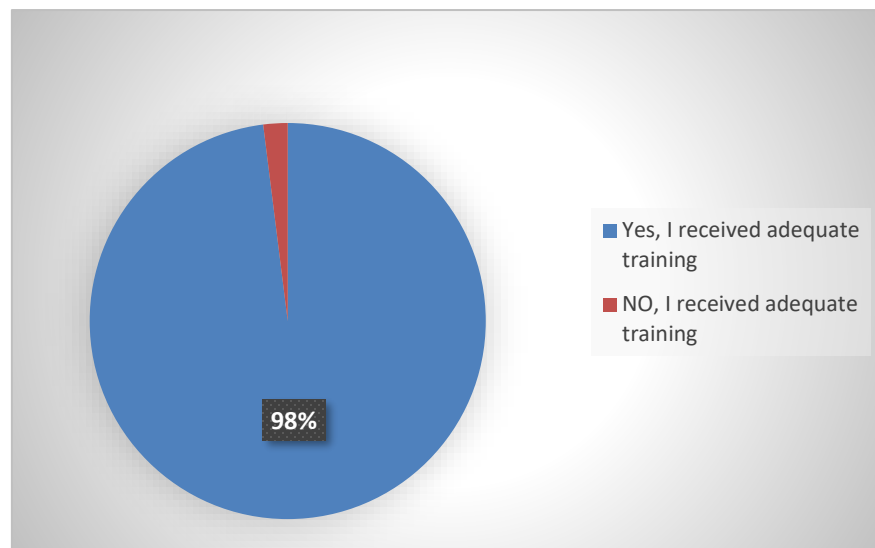


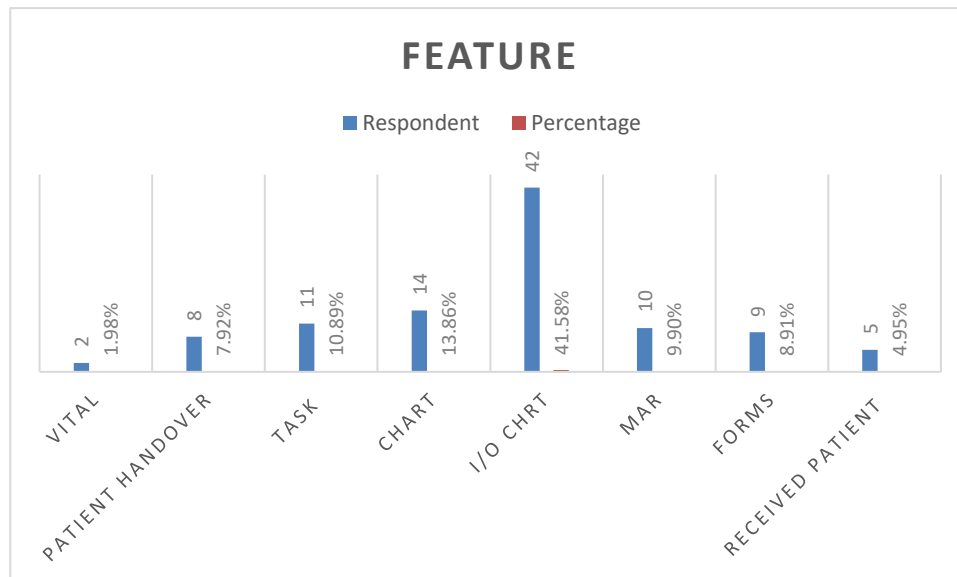
Figure 4.5.1: Percentage of users receiving adequate training or not

No, I did not receive adequate training: 2% of respondents reported that they did not receive adequate training. This indicates a small minority who may feel less confident in using the application due to insufficient training or support.

4.6: Features difficult to use or understand

The I/O Chart stands out as the most challenging feature, with 41% of respondents finding it difficult to use or understand, likely due to its detailed and critical nature in tracking fluid intake and output for patients.

Other features such as Chat, MAR, Task, Patient Handover, Forms, Vital, and Received Patient also pose varying degrees of difficulty for a smaller percentage of users, highlighting areas where additional training, support, or improvements in usability may be beneficial



Feature 4.6.1: Most difficult Feature of NAMAHA

I/O Chart: 41% of respondents find the I/O Chart feature difficult to use or understand. This feature involves various bugs and lack of incomplete options, also the cumulative balance is not properly calculated.

Chat: 13% of respondents find the Chat feature difficult to use or understand. This could indicate challenges in using the messaging or communication functionalities within the application effectively.

MAR (Medication Administration Record): 9% of respondents find the MAR feature difficult to use or understand. Mostly this feature is not used by the nurses.

Task: 2.97% of respondents find the Task feature difficult to use or understand. This feature involves task management functionalities, which may involve assigning, tracking, and completing nursing tasks efficiently.

Patient Handover: 7.92% of respondents find the Patient Handover feature difficult to use or understand. This feature involves transferring patient information between shifts, which may require clear communication and documentation practices.

Forms: 8.91% of respondents find the Forms feature difficult to use or understand. This feature involves only three forms which are Respiratory assessment, cardiovascular assessment, pain assessment. Due to lack of features and options which are on the paper are not added in those features.

Vital: 1% of respondents find the Vital feature difficult to use or understand. This feature involves recording and accessing vital signs of patients, which may involve specific protocols and accuracy in documentation.

Received Patient: 4.92% of respondents find the Received Patient feature difficult.

4.7: Time spend to enter patients' vitals

Time	Paper	NAMAH
Less than 1min	19.3%	84.9%
More than 1 min	80.7%	15.1%

Table 4.7.1: Time spent to enter Patient Vitals

19.3% of respondents indicated that they spend less than 1 minute entering patients' vitals when using paper-based methods while, 84.9% of respondents spend less than 1min to entering patient vital, which has improved drastically after the adoption of NAMAH.

80.7% of respondents indicate that they spend more than 1minute entering patient vitals when using paper-based methods while, 15.1% of respondent spend more than 1 minute entering patient vitals.

This depicts that paperwork is time consuming, heavy workload, and documentation burden whereas comparatively in NAMAH everything is digitalized.

4.8 : Time spend to enter Nursing progress note

Time	Paper	NAMAH
Less than 2min	17.4%	69.9%
More than 2 min	82.6%	30.1%

Table 4.8.1: Time spent to enter Nursing Progressive Note

Paper Documentation:

Less than 2 min: 17.4% of respondents indicated that they spend less than 2 minutes entering nursing progress notes when using paper-based methods. This suggests that a minority find it relatively quick to document in this format.

More than 2 min: 82.6% of respondents reported spending more than 2 minutes. This indicates that the majority find paper-based documentation time-consuming.

Namah Application:

Less than 2 min: 69.9% of respondents indicated that they spend less than 2 minutes entering nursing progress notes using the Namah application. This reflects a significant improvement in efficiency compared to paper-based methods, likely due to streamlined digital entry.

☐ **More than 2 min:** 30.1% of respondents still reported spending more than 2 minutes. This could be due to various factors such as the complexity of the note, detailed documentation requirements, or adjusting to digital workflows.

The comparison highlights that the Namah application significantly improves efficiency in entering nursing progress notes compared to traditional paper-based methods. The majority of users find it quicker to document using Namah, spending less than 2 minutes on average, which enhances productivity and allows nursing staff to allocate more time to direct patient care. This shift to digital documentation not only saves time but also enhances accuracy, accessibility, and overall workflow efficiency in healthcare settings.

4.9: Time take for the Patient Handover

Time	Paper	NAMAH
30 sec	15.9%	52.7%
40 sec	51.2%	24%
1 min	17.1%	18%
Above 1 min	15.9%	4.3%

Figure 4.9.1: Time taken for patient Handover

15.9% of respondents spend 30 sec on paper for the patient handover, whereas if we see in NAMAHA 52.7% of the respondents take 30 sec to give Patient Handover.

51.2% of respondents spend 40 sec on paper for the patient handover, whereas if we see in NAMAHA 24% of the respondents take 40 sec to give Patient Handover.

17.1% of respondents spend 1 min on paper for the patient handover, whereas if we see in NAMAHA 18% of the respondents take 1min to give Patient Handover.

15.9% of respondents spend Above 1min on paper for the patient handover, whereas if we see in NAMAHA 4.3% of the respondents take Above 1min to give Patient Handover.

According to the overall data we can see 52.7% of respondents take less time (30 sec) to give the patient handover in NAMAHA application as compared to the other value.

Namah reduces the percentage of users taking longer than 1 minute for patient handover significantly compared to paper-based methods, where a considerable portion takes more than 1 minute.

The comparison highlights that the Namah application offers substantial efficiency improvements in patient handover processes compared to traditional paper-based methods. The majority of users complete handover in significantly shorter times with Namah, demonstrating streamlined workflows and enhanced communication between healthcare providers.

4.10.1: Gap Analysis & Improvement Required: Feature Wise

S. No	Feature	Current Gap	Improvement
1.	Vitals	Fall Score Section: The user directly enters the Fall Risk Level from the options given in NAMAHA. (No Risk, Low, Medium, High)	Users are required to input a score for each specified variable as per NABH Standards. Additionally, the Fall Risk Assessment can be structured into a separate form.
Description: This correction is of utmost importance as the current procedure breaches the NABH Guidelines, Justification for the Fall Score Level must be provided, a feature lacking in the current process. Without this integration in NAMAHA, the users cannot transition to a paperless system.			

4.10.2: FALL RISK ASSESSMENT	
Variables	Date: (automated)
	Time: (automated)
	MAX SCORE
Confused-disoriented- Hallucinating	15
Unstable gait, weakness	10
History of syncope or seizures	25
Recent history of falls	25
Paralysis, hemiplegia, stroke	15
New medicines (i.e sedative)	20
Post-op condition sedated	20
Drug or alcohol withdrawal	20
Use of walker, cane, crutches	15
Postural hypotension	15
Poor eyesight	15
Narcotics, diuretics, antihypertensive	20
Bowel, bladder urgency - incontinence 15	15
Age 60 years or above 15	15
Uncooperative, impaired judgement	15

Language barrier	5
Poor hearing	5

CRITERIA TO AUTOMATE FALL RISK LEVEL		
Risk Level	Score	Action/ Workflow
No Risk	0	No Action required
Low Risk	1 To 24	Implement Low Risk Fall Prevention Interventions
Medium Risk	25 To 44	Implement Medium Risk Fall Prevention
High Risk	45 and Higher	Implement High Risk Fall Prevention Interventions

Sr.No	Feature	Current Gap	Improvement
2.	Vitals	SNDT is not present in the Vitals Feature. (Staff Nurse Digital Signature)	To integrate SNDT into the vitals feature of NAMAHA.
Description: The SNDT is essential for authenticating the individual responsible for conducting the patient's vital assessment.			

Sr.No	Feature	Current Gap	Improvement
3.	Vitals	Pain Score & Pain Location section present in Vitals assessment.	Eliminate the Pain Score and Pain Location section from the vitals feature since a comprehensive Pain Assessment form already exists within the application.
Description: Numerous users are not utilizing the pain assessment forms due to the assumption that entering pain scores and pain locations in the Vitals feature are the same. This results in duplicated efforts and user confusion.			

Sr.No	Feature	Current Gap	Improvement
4.	Handover	Inter-departmental handovers are not available in NAMAHA.	Users must have the option to transfer the patient within the application and the patient must be visible to the shift In-charge of the receiving department to assign staff nurse for the patient.
Description: To allow smooth transition of patient handover between departments. The absence of an inter-departmental transfer feature in NAMAHA has led to instances where patients remain under the "My Patients" list of staff nurses even after transfer. Additionally, patients may still be listed on the watchlist of shift in-charges. This gap disrupts the smooth and effective handover process.			

Sr.No	Feature	Current Gap	Improvement
5.	Shift In-Charge Dashboard	Shift In-charges must manually add all the patients in the ward under the watchlist.	Automate the watchlist feature by syncing with staff nurses “Add patient” feature by giving additional section to select Shift In-charge on duty and the patient must automatically reflect in Shift In-charge’s “watchlist” dashboard.
Description: Presently, shift in-charges at NICS manually add over 50 patients to their watchlist, imposing a substantial burden on their time and productivity. Automating this feature could significantly alleviate their workload and save user’s valuable time.			

Sr.No	Feature	Current Gap	Improvement
6.	CHAT	“Chat” feature currently does not have the facility to view past medical records and OP records like AADI	To integrate patient’s past medical records including OP records in “Chat” feature.
Description: Presently, nurses are utilizing AADI to access patients' previous medical histories. This reliance on AADI undermines the intended purpose of NAMAHA, as nurses are still dependent on an application primarily designed for doctors. Integrating patients past medical histories directly into NAMAHA would consolidate information, enabling nurses to rely on a single application rather than juggling between NAMAHA and AADI for essential patient data. This integration would streamline workflow, enhance efficiency, and ensure that nurses have all the information they need within the NAMAHA platform, ultimately improving patient care.			

Sr.No	Feature	Current Gap	Improvement
7.	Login Slowness	Landing page takes long time to load.	To identify the issue causing slowness and further reduce the loading time of NAMAHA.
Description: The NAMAHA Landing page takes 11-13 seconds to load with zero patients, while AADI loads in under 3 seconds with more than 5 patients. This disparity causes frustration and dissatisfaction among users, necessitating urgent attention to enhance NAMAHA's performance to improve the utilization, and minimize nurses' waiting time.			

Sr.No	Feature	Current Gap	Improvement
8.	MAR	Medicine Card: overview features are not added	Medicine card features should be added in the MAR, as it is mostly used form / document by the nurses.
Description: The "medicine card" refers to a patient's medical record or chart specifically dedicated to documenting their medication-related information. This card typically includes details such as the patient's allergies to food or drugs, previous medications taken, current prescriptions, dosage instructions, and any changes in medication status.			

Sr.No	Feature	Current Gap	Improvement
9.	I/O Chart	Intake and Outake chart; Users entered the value don't have option to correct the value.	Users must have option to amend the entered value .

Sr.No	Feature	Current Gap	Improvement
10.	I/O Chart	lack of yesterday's total balance visibility,(24 hr)	Include patient's I/O chart Balance history can be added.
Description: In paperwork Nurses used to add the balance on the daily basis (24 hr) Next shift nurses can easily use that balance sheet to calculate the cumulative balance. In NAMA H the previous history of total balance is not visible for the next shift nurses. Providing access to yesterday's total balance enables incoming shift nurses to quickly grasp the patient's fluid intake and output trends. Which result in the problem to check the yesterday total balance history by the next shift nurse.			

Sr.No	Feature	Current Gap	Improvement
11.	MAR	Difficulty foe users while searching for an item in MAR. such as medicine and IV fluid.	Generating the colour codes based on the categories.
Description: In MAR: Medical indent, The item is searched by users, sometime it is difficult for them to differentiate/ identify between medicines/ tablet and IV fluid due to same name. So, colour code or symbol representation should be added.			

4.11.1: USER FEEDBACK

Nurses appreciate NAMAH's integration with ATHMA for quick handovers and easy entry of vitals, foreseeing a significant reduction in workload. However, they've raised concerns regarding:

Login Slowness: Nurses experience delays in application loading, diverting attention from patient care.

Internet Issues: Persistent Wi-Fi disconnections on mobile devices necessitate multiple restarts to reconnect, impacting workflow due to device configurations.

Fixing frequent Issues: Nurses have requested to fix frequent issues that occur repeatedly such as 'Unit not Mapped' & 'Nurse category not mapped'.

4.12.1: ENHANCEMENT REQUESTS BY USERS

ICD – Drainage Sheet: Nurses have requested the integration of the ICD (Implantable Cardioverter Defibrillator) drainage sheet into NAMAH's "Forms" feature. This sheet is frequently used for all the Post-Op patients in the AITU and could significantly reduce nurses' workload.

Daily Skin Monitoring sheet: Integration of Daily skin monitoring sheet into NAMAH Forms feature. This sheet is frequently used every 3 hours for all the IP patients to identify visible changes in the skin that indicate increased risk for pressure ulcer development.

Ventilation Mode: Integrate ventilation mode additionally in the VITALS Feature of NAMAH application.

MODE VENT	(Ex: PRVC)
Tid Vol	(Ex: 450)
P. INSP	(Ex: 22)
I:E Ratio	(Ex: 1:2)
RATE	(Ex: 14)
PEEP/ CPAP	(Ex: 5)
Pt.Resp Rate	
FIO ²	(Ex: 80)
O2 SATURATION	(Ex: 100)
E.T. SUCTION	(Ex: Yes/No)

Table 4.12.2: **Ventilation Mode**

I/O Chart: For example, 10 infusions need to be given to the patient here, the user need to keep on adding those 10 infusions 10 different time. Whereas on paper the whole infusion column will be only written at once.

**Forms Handled by Nurses in NICS/ International Wing vs
Forms Integrated in NAMA**

Sl.No	FORMS in NICS	Version of Form	Integration in NAMA
1	Admission Form	V.1	YES; 'Chat'
2	Initial Assessment on Admission	V.3	NO
3	Billing	V.1	NO
4	Medicine Card	V.8	NO
5	Anaesthesia Card	V.1	NO
6	General Consent	V.3	NO
7	Operation Consent	V.5	NO
8	Anaesthesia Consent	V.4	NO
9	Blood Transfusion Consent	V.4	NO
10	Radiology Consent	V.3	NO
11	Covid Test Consent	V.1	NO
12	Physiotherapy Consent	V.1	NO
13	Restraints Consent	V.2	NO
14	Haemodialysis Consent	V.3	NO
15	Serology Consent	V.2	NO
16	DAMA Consent	V.2	NO
17	PPI Consent	V.2	NO
18	Procedure Checklist	V.2	NO
19	Requisition For Endoscopy	V.2	NO
20	Adult Cardiac handover Sheet	V.1	YES; 'Handovers'
21	Verbal Order	V.4	NO
22	IDTR	V.2	NO
23	Push Tool	V.1	NO
24	Pt. & Family Education	V.5	NO
25	Nursing Assessment on Admission	V.2	NO
26	Transfer & Verification	V.4	NO
27	Pt. Transfer Form to Ward	V.3	NO

28	cardiothoracic Transfer Orders	V.1	NO
29	MRD Form	V.2	NO
30	Blood Transfusion Sheet	V.2	NO
31	Nursing Shift Handover	V.4	Yes; Handover
32	Nursing Daily Assessment	V.4	Yes 'Vitals'
33	Fall Risk Assessment	V.2	Requires Enhancement
34	Sedation Assessment	V.2	Yes; 'Form-Pain'
35	Pain Assessment	V.2	Yes; 'Form-Pain'
36	Communication to Pt. & Family	V.1	NO
37	Nurses Progress Notes	V.2	YES; 'Handovers'
38	Doctor's Progress Notes	V.3	YES; 'Chat'
39	Intensive Treatment	V.1	NO
40	Input Insulin Infusion Chart	V.1	NO
41	Chart Drainage Checklist	V.1	NO
42	Activity & Care Tracking Chart	V.1	NO
43	Continues Cardiac Output Chart	V.1	NO
44	GCS Monitoring Chart	V.1	NO
45	IABP Checklist	V.1	NO
46	Daily Skin Monitoring	V.4	NO
47	ICO Drainage Sheet	V.4	NO
48	Input & Output Chart	V.1	YES I/O CHART
49	Request Radiology Form	V.1	NO
50	D/S Order	V.1	NO
51	Vitals signs Assessment	V.2	YES; 'Vitals'
52	Pt. Safety Rounds Checklist	V.2	NO
53	MEWS Chart	V.7	YES; 'Vitals'
54	Care plan	V.3	NO
55	Valve Book	V.1	NO
56	SSI (Surgical Site Infection)	V.2	NO
57	CLABSI (Central Line-Associated Bloodstream Infection)	V.2	NO
58	CAUTI (Catheter-Associated Urinary Tract Infection)	V.2	NO
59	VAP (Ventilator-Associated Pneumonia)	V.2	NO
60	Tracheostomy Checklist	V.1	NO
61	ICU Eye Status	V.2	NO
62	Skin Assessment	V.2	NO
63	Code Blue Sheet	V.3	NO

The chart above highlights the extensive potential for integration into the NAMAHA application, greatly enhancing its comprehensiveness. This integration could serve as a significant catalyst for the Unit 'NICS' to transition towards a paperless system in the future. By enabling the viewing of these forms within NAMAHA, nurses would have a centralized solution for accessing the majority of details necessary for their daily tasks and patient care, streamlining their workflow effectively.

CHAPTER 5:

Discussion

The research discussion for the NAMAHA project at Narayana Health focuses on evaluating how the mobile application addresses challenges faced by nurses in documenting patient care. By examining both quantitative and qualitative data from a diverse sample of nurses across various departments, this study aims to highlight the effectiveness of NAMAHA in reducing documentation workload and improving overall efficiency in healthcare delivery. Insights gathered from the survey and interviews underscore the importance of user-friendliness, training adequacy, and integration with existing workflows as critical factors influencing nurses' perception and adoption of the app.

The discussion will delve into identified gaps in NAMAHA's functionality and workflow, proposing actionable recommendations for enhancing usability and ensuring seamless integration into clinical practice. Ultimately, this research contributes to optimizing NAMAHA's role in supporting nurses, thereby allowing them to allocate more time and attention to patient care rather than administrative tasks.

The implementation and user feedback of the NAMAHA application present a compelling research discussion on the integration of digital technologies in healthcare settings. The project's findings underscore the transformative potential of digital tools like NAMAHA in enhancing efficiency and user satisfaction among nursing professionals. Key insights include the application's high user-friendliness ratings and the significant time savings observed in tasks such as patient vitals entry and nursing progress notes documentation compared to traditional paper-based methods.

However, the study also highlights challenges, such as usability issues with certain features like the Intake/Output (I/O) Chart and delays in application loading, which require targeted improvements. These findings suggest a critical need for ongoing research and development efforts focused on optimizing user experience, integrating additional functionalities like ICD drainage sheets and daily skin monitoring forms, and addressing technical barriers to ensure seamless adoption and sustained utilization of digital healthcare solutions like NAMAHA.

These findings suggest a critical need for ongoing research and development efforts focused on optimizing user experience, integrating additional functionalities like ICD drainage sheets and daily skin monitoring forms, and addressing technical barriers to ensure seamless adoption and sustained utilization of digital healthcare solutions like NAMAHA.

Such research discussions are pivotal in advancing our understanding of how technology can be effectively leveraged to streamline healthcare workflows, improve patient care outcomes, and meet the evolving needs of healthcare providers in diverse clinical environments

CHAPTER 6: CONCLUSION

In conclusion, The introduction of the Nursing Automation and Medical Administration Hub (NAMAHA) app presents a comprehensive solution to streamline documentation processes, enhance efficiency, and reduce burnout risks among nurses. By providing a digital platform for recording vital patient information, facilitating communication between healthcare professionals, and optimizing task management, the NAMAHA app aims to alleviate the burden on nurses and promote a sustainable work environment conducive to delivering exemplary cardiac care.

The objectives of NAMAHA focus on enabling nurses to spend more time on patient care by minimizing documentation tasks, reducing physical strain through streamlined access to patient information, empowering nurses digitally with mobile access, and ensuring secure storage of patient records. The app's features such as receiving patients, managing tasks, facilitating communication through chat, recording vitals, conducting assessments digitally, and streamlining handover processes revolutionize how nursing tasks are performed, enhancing operational efficiency and promoting better patient care outcomes.

The stakeholders involved in the implementation and utilization of the NAMAHA app play crucial roles in ensuring its successful integration within the hospital setting. From staff nurses to ward in-charges, educators, managers, IT departments, consultants, and developers, each stakeholder contributes to the effective adoption and utilization of this innovative technology. In conclusion, the NAMAHA app represents a significant step towards addressing the challenges faced by nursing staff at NICS by providing a digital solution that not only streamlines documentation processes but also enhances communication, task management, and overall efficiency in delivering cardiac care. By embracing technology to support nursing workflows, NICS can mitigate burnout risks, improve patient care quality, and create a more sustainable work environment for its dedicated healthcare professionals.

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CHAPTER 8: ANNEXURE

