CREATION OF AN ELECTRONIC HEALTH RECORD QUALITY ASSURANCE ASSESSMENT TOOL FOR NURSING DOCUMENTATION IN QATAR: AN EXPLORATORY SEQUENTIAL MIXED METHODS STUDY

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ABSTRACT

This study was carried out using an exploratory sequential mixed methods design by the researcher to develop and employ a quantitative survey to evaluate the current situation and influencing factors of the ELECTRONIC HEALTH RECORD QUALITY ASSURANCE ASSESSMENT TOOL.

The first phase (Phase 1) was based on a phenomenological approach to collecting data from nurse experts to explore their experiences in documentation using the Electronic Health Record through semi-structured interviews. From the experiences of the 15 participants, the researchers identified five major themes, including (1) Ensuring Data Safety and Security Issues (Data); (2) Enhancing Patient Care Coordination Issues (Patient Care); (3) Stabilizing the Clinical-Based Decision-Making Issues (CDSS); (4) Safeguarding Recording and Reporting Issues (Reporting and Documentation); (5) Resolving Technical Issues (Technology).

The next step (Phase 2) is to construct the actual items of the scale based on the themes gathered in the interview. For validity and reliability, the scale constructed was submitted to five (5) panels of nursing experts. For reliability, thirty-six (36) nurses who met the inclusion criteria were requested to participate. A two-part developed survey included forty-five (45) items in the questionnaire entitled "ELECTRONIC HEALTH RECORD QUALITY ASSURANCE ASSESSMENT TOOL (EHRQAAT)"; it contains the demographic information and, in the second part, the five dimensions of the EHRQAAT.

The last phase (Phase 3) was quantitative research, its aim to evaluate the quality of nursing documentation using Electronic Health Record using the newly developed tool. A total of 200 nurses, who have experience in utilizing electronic health record working across the globe. A total of 200 nurses were invited to participate in the survey. These nurses were working in facilities that utilize electronic documentation in the following countries: Qatar, Philippines, UAE, Saudi Arabia, Bahrain, Singapore, United States, Canada, United Kingdom, and Australia. These countries were purposely selected by the researcher to obtain diverse results that would aid in the analysis and development of a robust tool. Data analysis was performed using SPSS version 29.0 to conduct descriptive statistics for the measurements in the quantitative research.

The conclusion of the study highlighted several key outcomes: the effectiveness of the EHRQAAT, the key aspects it addressed, its global applicability, the enhancement of nursing leadership and staff development, and the improvement of patient care and safety.

Implications of the Study for Practice, Education, and Research: In practice, the study boosts quality assurance and operational efficiency in healthcare by offering the EHRQAAT as a structured and reliable tool to assess and enhance electronic health record systems. In education, the study's findings can be incorporated into nursing and healthcare management curricula to teach future professionals the importance of quality assurance in EHR systems. In research, the

EHRQAAT's development and validation lay a robust groundwork for future studies in the field of electronic health records.
Recommendations Based on the Study Findings: The study proposes several recommendations like implement and extensively use the EHRQAAT, provide training and professional development, engage in continuous monitoring and improvement, encourage interdisciplinary collaboration, conduct further research and development, adopt global best practices, and establish user feedback mechanisms.

Keywords: Nursing Assessment tool, data security issues, Data safety, enhancing patient care, safeguarding recording and reporting issues, resolving technical issues

INTRODUCTION

In today's rapidly evolving healthcare landscape, technology has become integral in enhancing patient care, streamlining processes, and ensuring accuracy in documentation. At the heart of this technological revolution is the EHR, a digital version of a patient's traditional paper chart. The EHR encapsulates a holistic view of the patient's health, ensuring real-time accessibility of information to healthcare professionals. Particularly for nurses, who stand at the forefront of patient care, EHRs have transformed the age-old practice of nursing documentation. This documentation, a critical aspect of nursing care, is a communication tool between healthcare providers, an evidence source for patient care decisions, and a legal document of care provided. As the researcher embarks on this study, she aims to unravel the significant influence of EHRs on nursing documentation, examining the benefits and obstacles they present in the multifaceted domain of patient care. This investigation piqued her curiosity, leading her to conceptualize a tool to evaluate documentation quality within electronic health records.

Within the broad spectrum of international healthcare, the EHR has cemented its role as a pivotal element in contemporary medical care. This global shift from conventional paper records to electronic systems is not just a trend but a transformative movement driven by the collective aspiration for promptness, precision, and easy access. EHRs provide an exhaustive snapshot of a patient's medical history, including past treatments and anticipated healthcare requirements, offering healthcare practitioners secure, immediate, and collaborative access. This worldwide transformation redefines patient care and impacts interprofessional dialogue, research opportunities, and global health decisions. Focusing on specific regional contexts like Qatar, the researcher observes distinct successes and obstacles in implementing and utilizing EHRs. In Qatar, a country swiftly progressing in its healthcare framework, adopting EHRs is fueled by substantial governmental support, resulting in advanced systems that elevate patient care and simplify nursing documentation. However, inherent to rapid technological shifts, issues such as data protection, system integration, and the need for comprehensive training remain. Incorporating a Quality Management System (QMS) into Electronic Health Records (EHR) and nursing notes elevates patient care by maintaining reliable, precise, and current medical files. This results in superior patient outcomes, heightened efficiency, diminished risks, adherence to regulatory benchmarks, ongoing advancement, improved communication among medical teams, safeguarded data, strategic insights, financial prudence, and augmented patient and staff satisfaction. Protective measures via quality assurance curtail EHR mistakes within EHRs, lowering potential legal threats and aligning with local and global criteria. Periodic assessments

and modifications boost the efficiency and versatility of the system. EHRs prioritizing quality offer comprehensive data analytics, enabling insightful planning and resource distribution. Even with the upfront costs, these frameworks yield long-term financial benefits. In summary, integrating QMS, QA, and QI within EHR and nursing records is indispensable to ensure unparalleled patient care amid the shifting medical landscape. Emphasizing the value of a Quality Management System in EHR and Nursing documentation leads to the timely identification and rectification of errors, thereby refining quality assurance and oversight processes (Afanasyeva,2022).

In today's fast-paced healthcare environment, the need for an updated assessment tool for Electronic Health Records (EHR) and nursing documentation must be balanced. This tool elevates patient care by ensuring comprehensive, accurate, and timely EHRs and nursing entries, leading to improved medical decision-making. Achieving consistency in capturing and retrieving data across different healthcare platforms becomes feasible through such standardization. By prioritizing quality assurance, the possibility of medical inconsistencies is reduced, bolstering trust in the recorded data. The tool enhances workflow efficiency, giving medical staff more time with patients. Accurate and uniform data sets the stage for in-depth data evaluations, which can lead to breakthroughs in patient care. Compliance with both local and international standards mitigates potential legal ramifications. For those new to the healthcare profession, such tools are invaluable and motivate software designers to improve their systems perpetually. The overall cost is reduced by reducing errors and streamlining procedures. Introducing a fresh EHR and nursing documentation assessment tool ensures compliance and fosters precise, efficient record-keeping (Untalan,2022).

LITERATURE REVIEW

Electronic Health Record

Lyons (2022) emphasizes the importance of carefully examining the integrity of EHR data before its application in clinical improvements and nursing research. The article introduces a theoretical approach to evaluate and enhance data across six dimensions: completeness, precision, consistency, credibility, promptness, and relevance. By showcasing two case studies, the article underscores possible challenges with EHR data and solutions to overcome them. It underlines the vital role of rigorous evaluation and refinement of EHR data for advancing clinical care and research.

This research explores how interruptions and other factors impact nurses' cognitive load and efficiency when working with electronic health records (EHR). Results indicate that disruptions during EHR tasks are common and come from various origins, leading to increased mental strain and adverse outcomes. The research suggests multiple approaches to address these challenges, such as minimizing unnecessary interruptions, offering training for nurses to handle disruptions, boosting proficiency in EHR usage, and refining the system (Shan, 2023).

Nursing Documentation

Nursing workload has been a significant concern in the healthcare industry. Studies have consistently shown that nurses spend much of their time on documentation and non-nursing

activities. It has been reported that nurses spend between 19% and 35% of their time on documentation alone. This increased documentation workload can lead to heightened cognitive workload for nurses, resulting in feelings of exhaustion and burnout (Groot, 2022). Furthermore, the introduction of clinical information systems in hospitals has further impacted nurses' workflow. While these systems have had positive consequences regarding patient safety and quality of care, they have also led to increased documentation.

Quality Assurance

The study found that using an integrated EHR improved communication, information access, and medication administration processes' safety in nursing practice. The paper "Nurses' Use of an Integrated Electronic Health Record: Results of a Case Site Analysis" examines the impact of an EHR on nursing practice, including communication, information access, and medication administration. It highlights efficiency, safety, and communication improvements and identifies variability in how EHRs support care documentation and improve organizational care quality. The findings contribute to understanding the impact of EHR systems on nurses' practice (Dowding, 2015)

Current practice of Quality Assurance in HER

Sengstack (2022) Implemented the Safety Assurance Factors for EHR Resilience (SAFER)Guides that provide recommended practices for ensuring the safety of EHR systems. The guides include worksheets for each recommended practice, identifying the individuals involved in the assessment, documenting the assessment itself, and describing follow-up activities.

Heidemann (2019) developed an assessment tool to measure the quality of electronic health record inpatient documentation for cross-cover events. Cross-cover events in healthcare can cause communication breakdowns, affecting patient care. A guideline was recommended using standardized written templates and verbal face-to-face communication during patient handovers.

Available Quality Assurance Tool

Quality assurance in EHR nursing documentation is vital to ensure patient safety, maintain data integrity, and deliver high-quality patient care. Several tools and systems have been developed to support quality assurance in EHR nursing documentation. Here is a list of available tools, methodologies, and systems that have been adopted in various healthcare settings:

Standardized Nursing Terminologies Tools like NANDA (North American Nursing Diagnosis Association), NIC (Nursing Interventions Classification), and NOC (Nursing Outcomes Classification) help in standardizing nursing documentation and improving its quality. Computerized Decision Support Systems (CDSS) are systems that are integrated into EHRs to help nurses make decisions by providing evidence-based recommendations. They can help in ensuring the quality of nursing documentation by prompting accurate and consistent entries. Structured Template Documentation is a built-in structured template in the system for nursing

documentation, which helps ensure that all necessary data is captured consistently and comprehensively.

Audit Tools: Many EHR systems come with built-in audit tools that allow for regular checks of the nursing documentation for inconsistencies, missing data, or other potential issues.
Clinical Quality Measure (CQM) Tools assist in assessing and monitoring patient care quality, intricately linked to the precision and thoroughness of nursing records.
The System Usability Scale (SUS) can be used to assess the user-friendliness of EHR systems, which, when enhanced, can improve the quality of nursing records.
Clinical Documentation Improvement (CDI) Software refers to software tailored to enhance the precision and quality of clinical records in EHRs.
Integrated Voice Recognition Systems, such as Dragon Medical, enable nurses to verbally record notes automatically transcribed into the EHR, facilitating the capture of in-depth patient stories and enhancing documentation quality.
Feedback Mechanisms within EHRs: Some EHRs come with integrated feedback tools that immediately inform users of any real-time discrepancies or inconsistencies.
Interoperability Testing Tools, like those from IHE (Integrating the Healthcare Enterprise), facilitate effective communication between EHR systems, preserving the consistency and integrity of nursing documentation across various platforms.
The Electronic Health Record-System Functional Model (EHR-S FM), crafted by HL7, offers a uniform framework and details for the functions of EHR systems, encompassing aspects like nursing documentation.

Themes Emerged

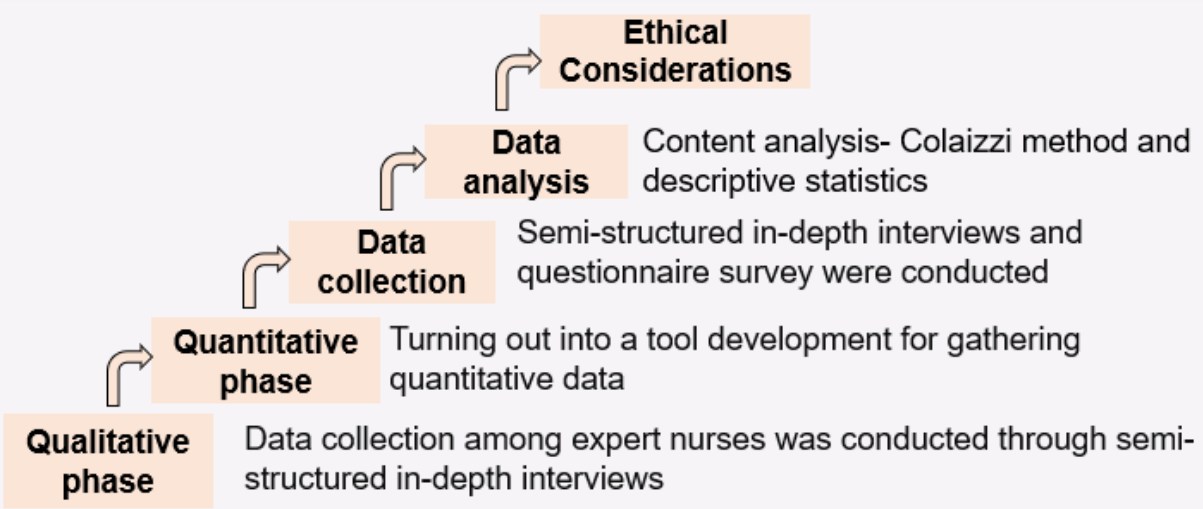
This tool emerged from a newly developed EHRQAAT (Electronic Health Record Quality Assurance Assessment Tool).
Data Safety and Security (DSS) In this section, the critical focus of this tool is to ensure that data entry, archival, and verification processes in healthcare systems are accurate, secure, and reliable, helping maintain patient data privacy and confidentiality.
The second section focuses on Enhancing Patient Care Coordination Issues (Patient Care), covering key aspects of patient information integration, communication, and care coordination. The focus here is on ensuring that patient care is personalized, efficient, and well-coordinated, emphasizing streamlining care activities, supporting compliance, and maintaining the continuity of care through timely communication and efficient referral processes.
This section focuses on stabilizing clinical-based decision-making issues (CDSS), emphasizing the use of clinical decision support systems (CDSS) to improve decision-making processes in healthcare. The focus here is leveraging CDSS to provide evidence-based support, streamline decision-making, and reduce clinical errors while integrating systems into the clinical workflow to enhance efficiency and patient care.
This section addresses Safeguarding Recording and Reporting Issues (Reporting and Documentation), focusing on ensuring the accuracy, consistency, and quality of healthcare reporting and documentation systems. The focus here is on enhancing the reporting and documentation process to improve accuracy, enable real-time updates, and ensure standardized, high-quality record-keeping, thus minimizing errors and maintaining thorough data collection.

This section is focused on Resolving Technical Issues (Technology) and deals with the impact of technical problems on clinical workflows and healthcare operations. This section highlights how technical issues, such as system downtime, software updates, and system failures, can disrupt healthcare workflows, patient care, and overall system efficiency. It also emphasizes the need for troubleshooting to resolve these issues promptly to minimize the impact on daily operations.

METHODOLOGY

This research utilized the exploratory sequential mixed methods and various phases were employed. This method began with Qualitative phase by interviewing expert Nurses using semi-structured, in-depth interviews. Quantitative phase- Turning out into a tool development for gathering quantitative data. Data collection- Semi-structured in-depthinterviews and questionnaire surveys were applied. Data analysis- Content analysis-Colaizzi method and descriptive statistics. All these steps adhered closely to the Ethical Considerations set out by the Declaration of Helsinki and the Belmont Report, which include Informed Consent, Beneficence, Respect, and Justice.

Table 1- Methodology



RESULTS

The following sub-sections were presented in various phases: Phase 1 (Qualitative), Phase 2 (Integration Phase), and phase 3 (Quantitative).

Phase 1 -Qualitative Results of The Exploratory Sequential Mixed Methods

Based on the interview transcripts from various nurse experts, five major themes emerged regarding their experiences with Electronic Health Records (EHR) systems. These themes are: 1) Ensuring Data Safety and Security; 2) Enhancing Patient Care Coordination: 3) Stabilizing Clinical-Based Decision Making (CDSS); 4)Safeguarding, Recording and Reporting: 5)Resolving Technical Issues.

Phase 2 – Integration Phase

Since this is a sequential method the qualitative results of phase 1 were used to create a tool that will be transformed into quantitative concepts and constructs.also, please bear in mind that expert opinions were considered in finalizing the overall qualitative results, through a series of round table discussions.As shown in the table, each thematic construct has 3 cluster of themes. The three clusters of themes were transformed into three survey constructs, and each survey construct consisting of three survey items based on the narratives of the participants. The last column presents the modified survey items, which were refined based on expert opinions.Overall, the integration phase has 5 thematic constructs with 15 clusters of themes, resulting in a total of 15 items survey concepts 15 survey constructs, a total of 45 survey items based on the narratives of the participants and 45 modified survey items base on expert's opinions.

Table 2- Integration Phase

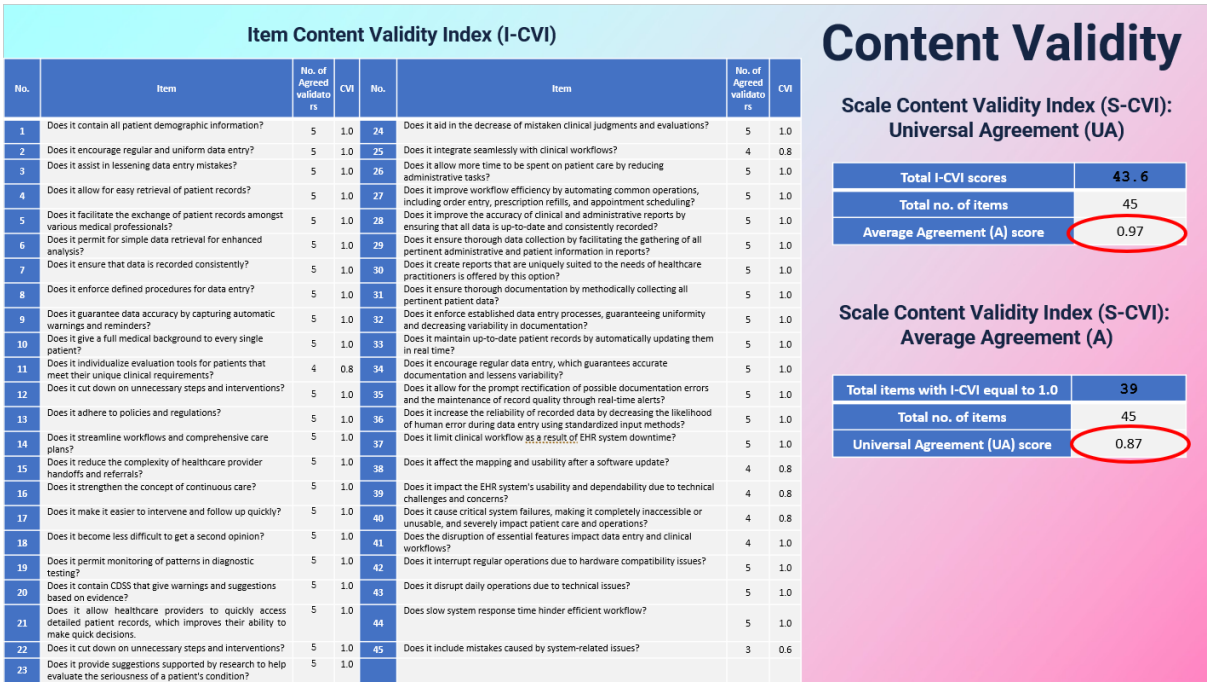
Thematic Construct	Cluster of Themes	No. of Items	Survey Concept	Survey Construct	Survey Items (Based on the Narratives of the Participants)	Modified Survey Items (Experts' Opinions)
1) Ensuring Data Safety and Security Issues (DATA)	Attributing the Accuracy of Data Entry	3	Data Privacy and Confidentiality Aspect	Data Accuracy	Indicates all demographic profiles of patients in the EHR system?	Does it contain all patient demographic information?
					Promotes consistent and standardized data entry practices?	Does it encourage regular and uniform data entry?
					Helps reduce errors in data entry?	Does it assist in lessening data entry mistakes?
	Retrieving Information from Data Archives			Data Archival System	Provides quick access to patient information?	Does it allow for easy retrieval of patient records?
					Allows shared access to patient information among multiple healthcare providers?	Does it facilitate the exchange of patient records amongst various medical professionals?
					Enables easy retrieval of data for better analysis?	Does it permit for simple data retrieval for enhanced analysis?
	Verifying Data Information and Procedures			Data Verification Process	Ensures consistency in data recording?	Does it ensure that data is recorded consistently?
					Enforces standardized procedures for data entry?	Does it enforce defined procedures for data entry?
					Captures automated alerts and reminders to ensure data accuracy?	Does it guarantee data accuracy by capturing automatic warnings and reminders?
2) Enhancing Patient Care Coordination Issues (PATIENT CARE)	Integrating Patient Information and Assessment	3	Patient Care Aspect	Patient Assessment	Supply comprehensive medical history for each patient?	Does it give a full medical background to every single patient?
					Tailored patient assessment forms and templates that suit specific clinical needs?	Does it individualize evaluation tools for patients that meet their unique clinical requirements?
					Integrates well with diagnostic tools and tests?	Does it fit in smoothly with existing diagnostic resources?
	Communicating Patient's Needs			Activities and Interventions Requirement	Minimizes redundant activities and interventions?	Does it cut down on unnecessary steps and interventions?
					Supports regulatory compliance?	Does it adhere to policies and regulations?
					Streamlines workflows and comprehensive care plans?	Does it streamline workflows and comprehensive care plans?
	Evaluating Patient Care Coordination			Patient Care Coordination	Simplifies the referral process and handoffs between healthcare providers?	Does it reduce the complexity of healthcare provider handoffs and referrals?
					Reinforces the continuity of care?	Does it strengthen the concept of continuous care?
					Facilitates timely interventions and follow-ups?	Does it make it easier to intervene and follow up quickly?
3) Stabilizing the Clinical-Based Decision Making Issues (CDSS)	Utilizing Clinical Decision Support System	3	Clinical Decision Support System Aspect	Clinical Diagnosis	Makes it easier to obtain second opinions?	Does it become less difficult to get a second opinion?
					Enables the tracking of diagnostic trends?	Does it permit monitoring of patterns in diagnostic testing?
					Includes Clinical Decision Support Systems (CDSS) that provide evidence-based recommendations and alerts?	Does it contain CDSS that give warnings and suggestions based on evidence?
	Impacting Patient Care Support			Assessment of Severity	Provides healthcare providers with immediate access to comprehensive patient records, facilitating more informed and timely decision-making?	Does it allow healthcare providers to quickly access detailed patient records, which improves their ability to make quick decisions.
					Offers evidence-based recommendations that aid in assessing patient severity?	Does it provide suggestions supported by research to help evaluate the seriousness of a patient's condition?
					Helps reduce errors in clinical assessments and decisions?	Does it allow healthcare providers to quickly access detailed patient records, which improves their ability to make quick decisions.
	Integrating Clinical Workflows			Clinical Management	Integrates seamlessly with clinical workflows?	Does it integrate seamlessly with clinical workflows?
					Reduces the time spent on administrative tasks, allowing more focus on patient care?	Does it allow for more time to be spent on patient care by reducing administrative tasks?
					Automates routine tasks such as order entry, prescription refills, and appointment scheduling, improving workflow efficiency?	Does it improve workflow efficiency by automating common operations including order entry, prescription refills, and appointment scheduling?

4) Safeguarding Recording and Reporting Issues (REPORTING AND DOCUMENTATION)	Confirming Robust Reporting Mechanisms	3	Documentation Aspect	Reporting Structure	Improves the accuracy of clinical and administrative reports by ensuring that all data is up-to-date and consistently recorded?	Does it improve the accuracy of clinical and administrative reports by ensuring that all data is up-to-date and consistently recorded?
					Facilitates comprehensive data collection, ensuring that all relevant patient and administrative information is captured in reports?	Does it ensure thorough data collection by facilitating the gathering of all pertinent administrative and patient information in reports?
					Offers customizable reporting options that allow healthcare providers to generate specific reports tailored to their needs?	Does it create reports that are uniquely suited to the needs of healthcare practitioners is offered by this option?
	Ensuring Systematic Recording Protocols			Record Management	Ensures comprehensive record-keeping, capturing all relevant patient information systematically?	Does it ensure thorough documentation by methodically collecting all pertinent patient data?
					Enforces standardized data entry protocols, ensuring consistency and reducing variability in documentation?	Does it enforce established data entry processes, guaranteeing uniformity and decreasing variability in documentation?
					Provides real-time updates to patient records, ensuring that the most current information is always available?	Does it maintain up-to-date patient records by automatically updating them in real time?
	Controlling the Quality of Record and Reporting System			Quality Assurance	Promotes consistent data entry practices, reducing variability and ensuring high-quality documentation?	Does it encourage regular data entry, which guarantees accurate documentation and lessens variability?
					Provides real-time alerts for potential errors in documentation, allowing immediate corrections and maintaining record quality?	Does it allow for the prompt rectification of possible documentation errors and the maintenance of record quality through real-time alerts?
					Improves the accuracy of recorded data by reducing manual entry errors through standardized input methods?	Does it increase the reliability of recorded data by decreasing the likelihood of human error during data entry using standardized input methods?
5) Resolving Technical Issues (TECHNOLOGY)	Counting Technical Issue Cases	3	Technological Aspect	Technical Nature	Affects clinical workflow due to some downtime of the EHR system?	Does it limit clinical workflow as a result of EHR system downtime?
					Affects the mapping and usability after a software update?	Does it affect the mapping and usability after a software update?
					Affects the usability and reliability of the EHR system due to technical concerns and issues?	Does it impact the EHR system's usability and dependability due to technical challenges and concerns?
	Figuring-out Severity of the Technical Issues			Incident Severity Levels	Causes critical system failures due to completely inaccessible or unusable, severely impacting patient care and operations?	Does it cause critical system failures, making it completely inaccessible or unusable, and severely impact patient care and operations?
					Disrupts key functionalities affects clinical workflows and data entry?	Does the disruption of essential features impact data entry and clinical workflows?
					Causes disruptions in daily operations due to hardware compatibility problems?	Does it interrupt regular operations due to hardware compatibility issues?
	Identifying Other Technical Issues and Problems			Troubleshooting Measures	Disrupts daily operations due to technical issues?	Does it disrupt daily operations due to technical issues?
					Slows system response times hinder efficient workflow?	Does slow system response time hinder efficient workflow?
					Contains errors due to system-related issues?	Does it include mistakes caused by system-related issues?
5	**15**	**15**	**5**	**15**	**45**	**45**

Face Validity-In validating the newly developed monitoring tool, face validity was assessed by 5 experts focusing on 6 criteria like appropriateness of grammar, clarity and unambiguity of items, correct spelling of words, correct structuring of the sentences, appropriateness of font size and structure of the instrument in terms of construction & well-thought-out format.The experts provided overall feedback, agreeing that the monitoring tool is well-designed and ready for the next phase of reliability testing.

No.	Criteria	Panel's Qualitative Comments	Panel Reviewers
1	Appropriateness of grammar	All experts agree that the survey tool uses appropriate and correct grammar throughout, ensuring professionalism and clarity.	1,2,3,4, and 5
2	Clarity and unambiguity of items	They all highlight that the items are clear and unambiguous, though Experts 2 and 4 mention that a few items could benefit from rewording for improved clarity.	1,3 and 5
3	Correct spelling of words	All agree that the survey contains no spelling errors, enhancing professionalism and readability.	1,2,3,4, and 5
4	Correct structuring of the sentences	They concur that sentences are well-structured, making the survey easy to read and understand.	1,2,3,4, and 5
5	Appropriateness of font size	They emphasize that the font size is appropriate, ensuring readability without causing eye strain.	1,3,4 and 5
6	Structure of the instrument in terms of construction & well-thought-out format	All experts note that the survey is well-constructed with a logical flow, making it easy for respondents to navigate from one section to the next.	1,2,4 and 5
Overall Comments: **Overall, all experts agree that the survey tool is well-designed and ready for the next phase of reliability testing, with minor suggestions for further improvement from one expert.**			

Content validity was tested using a panel of experts, with an average agreement score of 0.97 and a universal agreement score of 0.87, both indicating a high level of appropriateness for the survey items.



Item Content Validity Index (I-CVI)

No.	Item	No. of Agreed validators	CVI	No.	Item	No. of Agreed validators	CVI
1	Does it contain all patient demographic information?	5	1.0	24	Does it aid in the decrease of mistaken clinical judgments and evaluations?	5	1.0
2	Does it encourage regular and uniform data entry?	5	1.0	25	Does it integrate seamlessly with clinical workflows?	4	0.8
3	Does it assist in lessening data entry mistakes?	5	1.0	26	Does it allow more time to be spent on patient care by reducing administrative tasks?	5	1.0
4	Does it allow for easy retrieval of patient records?	5	1.0	27	Does it improve workflow efficiency by automating common operations, including order entry, prescription refills, and appointment scheduling?	5	1.0
5	Does it facilitate the exchange of patient records amongst various medical professionals?	5	1.0	28	Does it improve the accuracy of clinical and administrative reports by ensuring that all data is up-to-date and consistently recorded?	5	1.0
6	Does it permit for simple data retrieval for enhanced analysis?	5	1.0	29	Does it ensure thorough data collection by facilitating the gathering of all pertinent administrative and patient information in reports?	5	1.0
7	Does it ensure that data is recorded consistently?	5	1.0	30	Does it create reports that are uniquely suited to the needs of healthcare practitioners is offered by this option?	5	1.0
8	Does it enforce defined procedures for data entry?	5	1.0	31	Does it ensure thorough documentation by methodically collecting all pertinent patient data?	5	1.0
9	Does it guarantee data accuracy by capturing automatic warnings and reminders?	5	1.0	32	Does it enforce established data entry processes, guaranteeing uniformity and decreasing variability in documentation?	5	1.0
10	Does it give a full medical background to every single patient?	5	1.0	33	Does it maintain up-to-date patient records by automatically updating them in real time?	5	1.0
11	Does it individualize evaluation tools for patients that meet their unique clinical requirements?	4	0.8	34	Does it encourage regular data entry, which guarantees accurate documentation and lessens variability?	5	1.0
12	Does it cut down on unnecessary steps and interventions?	5	1.0	35	Does it allow for the prompt rectification of possible documentation errors and the maintenance of record quality through real-time alerts?	5	1.0
13	Does it adhere to policies and regulations?	5	1.0	36	Does it increase the reliability of recorded data by decreasing the likelihood of human error during data entry using standardized input methods?	5	1.0
14	Does it streamline workflows and comprehensive care plans?	5	1.0	37	Does it limit clinical workflow as a result of EHR system downtime?	5	1.0
15	Does it reduce the complexity of healthcare provider handoffs and referrals?	5	1.0	38	Does it affect the mapping and usability after a software update?	4	0.8
16	Does it strengthen the concept of continuous care?	5	1.0	39	Does it impact the EHR system's usability and dependability due to technical challenges and concerns?	4	0.8
17	Does it make it easier to intervene and follow up quickly?	5	1.0	40	Does it cause critical system failures, making it completely inaccessible or unusable, and severely impact patient care and operations?	4	0.8
18	Does it become less difficult to get a second opinion?	5	1.0	41	Does the disruption of essential features impact data entry and clinical workflows?	4	1.0
19	Does it permit monitoring of patterns in diagnostic testing?	5	1.0	42	Does it interrupt regular operations due to hardware compatibility issues?	5	1.0
20	Does it contain CDSS that give warnings and suggestions based on evidence?	5	1.0	43	Does it disrupt daily operations due to technical issues?	5	1.0
21	Does it allow healthcare providers to quickly access detailed patient records, which improves their ability to make quick decisions.	5	1.0	44	Does slow system response time hinder efficient workflow?	5	1.0
22	Does it cut down on unnecessary steps and interventions?	5	1.0	45	Does it include mistakes caused by system-related issues?	3	0.6
23	Does it provide suggestions supported by research to help evaluate the seriousness of a patient's condition?	5	1.0				

Content Validity

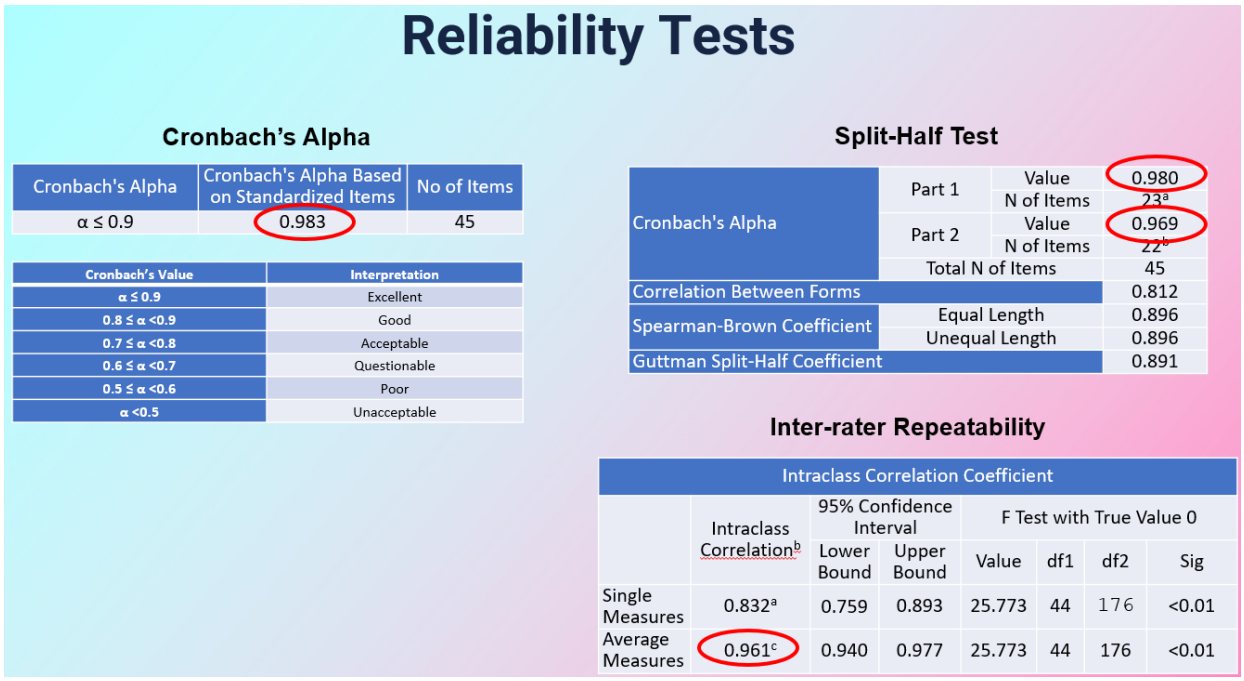
Scale Content Validity Index (S-CVI): Universal Agreement (UA)

Total I-CVI scores	43.6
Total no. of items	45
Average Agreement (A) score	0.97

Scale Content Validity Index (S-CVI): Average Agreement (A)

Total items with I-CVI equal to 1.0	39
Total no. of items	45
Universal Agreement (UA) score	0.87

Reliability tests were assessed using cronbach's alpha, split-half test, and inter-rater repeatability, all of which demonstrated strong correlations and high levels of agreement.



Reliability Tests

Cronbach's Alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
α ≤ 0.9	0.983	45

Cronbach's Value	Interpretation
α ≤ 0.9	Excellent
0.8 ≤ α <0.9	Good
0.7 ≤ α <0.8	Acceptable
0.6 ≤ α <0.7	Questionable
0.5 ≤ α <0.6	Poor
α <0.5	Unacceptable

Split-Half Test

Cronbach's Alpha	Part 1	Value	0.980
		N of Items	23[a]
	Part 2	Value	0.969
		N of Items	22[b]
	Total N of Items		45
Correlation Between Forms			0.812
Spearman-Brown Coefficient	Equal Length		0.896
	Unequal Length		0.896
Guttman Split-Half Coefficient			0.891

Inter-rater Repeatability

Intraclass Correlation Coefficient							
	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.832[a]	0.759	0.893	25.773	44	176	<0.01
Average Measures	0.961[c]	0.940	0.977	25.773	44	176	<0.01

Phase 3 – Quantitative Investigation

Using a descriptive strategy, the newly developed monitoring tool, which has been validated and proven reliable, was tested with 200 participants. The table shows that the demographic profile

consist of gender, age, civil status, educational attainment, work experience, hospital type, job position, and country.

Descriptive Strategy (N=200)

Demographic Profile

Demographic Profile	Description	f	%
Gender	Female	124	62
	Male	76	38
	Total	200	100%
Age	21-30	22	11
	31-40	100	50
	41-50	59	29.5
	51-60	19	9.5
	61 and above	0	0
	Total	200	100%
Civil Status	Married	117	58.5
	Single	76	38
	Widowed	5	2.5
	Others	2	1
	Total	200	100%
Educational Attainment	Bachelor	124	62
	Master	63	31.5
	Doctorate	13	6.5
	Total	200	100%
Work Experience	1-5 years	29	14.4
	6-10 years	40	20
	11-15 years	62	31
	16-20 years	44	22
	21-25 years	13	6.5
	25 years and more	12	6
	Total	200	100%
Hospital Type	Health Center	26	13
	Clinics	16	8
	Hospitals	158	79
	Total	200	100%
Job Position	Staff Nurse	109	54.5
	Charge Nurse	31	15.5
	Head Nurse	21	10.5
	Supervisor	31	15.5
	Others	8	4
	Total	200	100%
Country	Qatar	67	33.5
	Philippines	35	17.5
	UAE	21	10.5
	Saudi Arabia	10	5
	Bahrain	12	6
	Singapore	14	7
	United States	14	7
	Canada	6	3
	United Kingdom	9	4.5
	Australia	12	6
	Total	200	100%

These are the results of the survey according to the concept. To analyze the results, each domain was measured based on survey items (n=9) that were summed accordingly. Overall, The Newly Developed Tool That Was Administered To 200 Participants Achieved an Overall Mean Of 4.25, Which Is Interpreted as Excellent.

The survey produced excellent ratings across the five domains, indicating that the tool effectively captured the key issues related to ehr quality assurance in nursing documentation.

Survey Concept	Survey Item	Weighted Mean	Interpretation
Data Privacy and Confidentiality Aspect (DPC)	Does it contain all patient demographic information?	4.38	**Excellent**
	Does it encourage regular and uniform data entry?	4.31	**Excellent**
	Does it assist in lessening data entry mistakes?	4.27	**Excellent**
	Does it allow for easy retrieval of patient records?	4.60	**Excellent**
	Does it facilitate the exchange of patient records amongst various medical professionals?	4.32	**Excellent**
	Does it permit for simple data retrieval for enhanced analysis?	4.36	**Excellent**
	Does it ensure that data is recorded consistently?	4.33	**Excellent**
	Does it enforce defined procedures for	4.29	**Excellent**

	data entry?		
	Does it guarantee data accuracy by capturing automatic warnings and reminders?	4.29	**Excellent**
	Sub mean	**4.35**	**Excellent**
Patient Care Aspect (PC)	Does it give a full medical background to every single patient?	4.58	**Excellent**
	Does it individualize evaluation tools for patients that meet their unique clinical requirements?	4.22	**Excellent**
	Does it fit in smoothly with existing diagnostic resources?	4.31	**Excellent**
	Does it cut down on unnecessary steps and interventions?	4.13	**Very Good**
	Does it adhere to policies and regulations?	4.58	**Excellent**
	Does it streamline workflows and comprehensive care plans?	4.26	**Excellent**
	Does it reduce the complexity of healthcare provider handoffs and referrals?	4.29	**Excellent**
	Does it strengthen the concept of continuous care?	4.22	**Excellent**
	Does it make it easier to intervene and follow up quickly?	4.28	**Excellent**
	Sub mean	**4.32**	**Excellent**
Documentation Aspect (D)	Does it improve the accuracy of clinical and administrative reports by ensuring that all data is up-to-date and consistently recorded?	4.39	**Excellent**
	Does it ensure thorough data collection by facilitating the gathering of all pertinent administrative and patient information in reports?	4.19	**Very Good**
	Does it create reports that are uniquely suited to the needs of healthcare practitioners is offered by this option?	4.23	**Excellent**
	Does it ensure thorough documentation by methodically collecting all pertinent patient data?	4.28	**Excellent**
	Does it enforce established data entry processes, guaranteeing uniformity and decreasing variability in documentation?	4.29	**Excellent**
	Does it maintain up-to-date patient records by automatically updating them in real time?	4.40	**Excellent**

	Does it encourage regular data entry, which guarantees accurate documentation and lessens variability?	4.22	**Excellent**
	Does it allow for the prompt rectification of possible documentation errors and the maintenance of record quality through real-time alerts?	4.29	**Excellent**
	Does it increase the reliability of recorded data by decreasing the likelihood of human error during data entry using standardized input methods?	4.36	**Excellent**
	Sub mean	**4.29**	**Excellent**
Clinical Decision Support System Aspect (CDSS)	Does it become less difficult to get a second opinion?	4.17	**Very Good**
	Does it permit monitoring of patterns in diagnostic testing?	4.33	**Excellent**
	Does it contain CDSS that give warnings and suggestions based on evidence?	4.27	**Excellent**
	Does it allow healthcare providers to quickly access detailed patient records, which improves their ability to make quick decisions.	4.49	**Excellent**
	Does it provide suggestions supported by research to help evaluate the seriousness of a patient's condition?	4.17	**Very Good**
	Does it aid in the decrease of mistaken clinical judgments and evaluations?	4.17	**Very Good**
	Does it integrate seamlessly with clinical workflows?	4.26	**Excellent**
	Does it allow for more time to be spent on patient care by reducing administrative tasks?	4.19	**Very Good**
	Does it improve workflow efficiency by automating common operations including order entry, prescription refills, and appointment scheduling?	4.33	**Excellent**
	Sub mean	**4.26**	**Excellent**
Technological Aspect (T)	Does it limit clinical workflow as a result of HER system downtime?	4.70	**Excellent**
	Does it affect the mapping and usability after a software update?	3.70	**Very Good**
	Does it impact the HER system's usability and dependability due to technical challenges and concerns?	4.12	**Very Good**
	Does it cause critical system failures, making it completely inaccessible or	3.93	**Very Good**

	unusable, and severely impact patient care and operations?		
	Does the disruption of essential features impact data entry and clinical workflows?	3.96	**Very Good**
	Does it interrupt regular operations due to hardware compatibility issues?	3.65	**Very Good**
	Does it disrupt daily operations due to technical issues?	3.86	**Very Good**
	Does slow system response time hinder efficient workflow?	4.35	**Excellent**
	Does it include mistakes caused by system-related issues?	3.98	**Very Good**
	Sub mean	**4.03**	**Very Good**
	OVERALL MEAN	**4.25**	**Excellent**

Legend: Excellent= 4.21-5.00; Very Good= 3.41-4.20; Good= 2.61-3.40; Fair= 1.81-2.60; Poor= 1.00-1.80

Staff development

Proposed Staff Development Program

The proposed Staff Development Program has been structured for universal application. It is designed for a 5-month implementation period followed by a 1-month evaluation. To achieve optimal results, the program is intended to be conducted twice per year.

Title: Enhancing Nursing Documentation with the use of EHR Quality Assurance Assessment Tool

Goal: Aimed to improve proficiency in data security, patient care coordination, clinical decision-making, documentation accuracy, and technical problem-solving. The program is designed to be implemented over five months followed by 1 month with measurable outcomes to enhance the overall quality of nursing documentation.

Key Areas of Improvement:

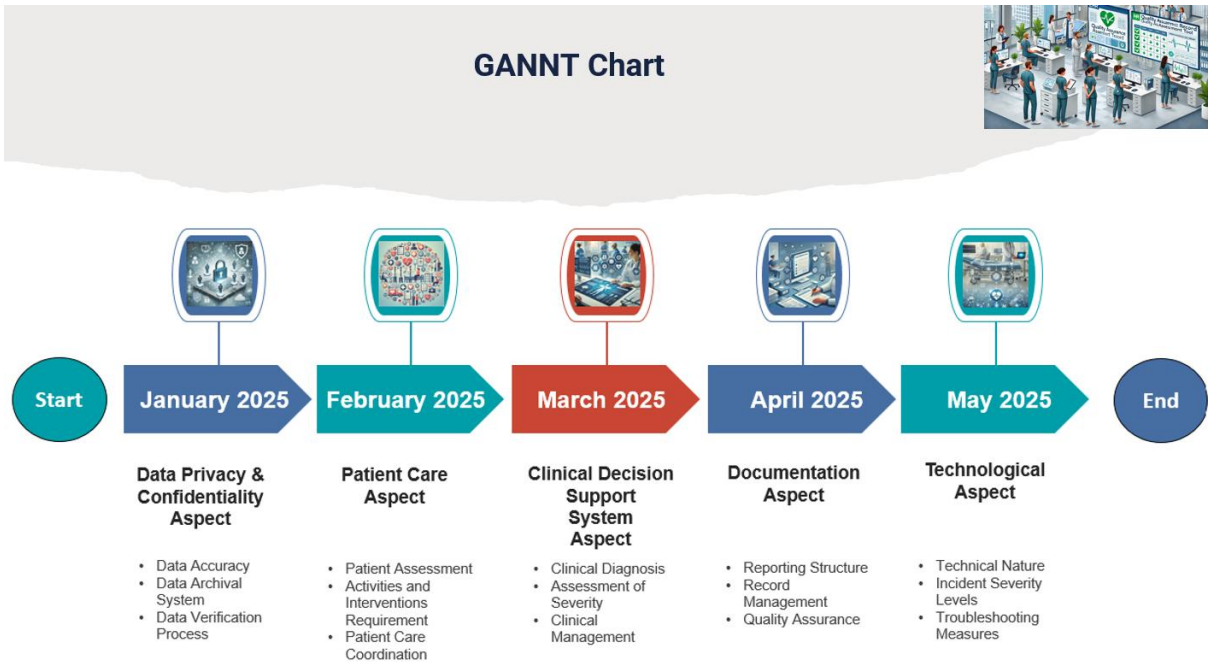
1. **Data Safety and Security-** Ensure all staff can effectively implement data protection measures, reducing data breach risks.
2. **Patient Care Coordination-** Improve the coordination of patient care to streamline processes, reduce delays, and enhance the patient experience.
3. **Clinical-Based Decision Making-** Stabilize clinical decision-making by improving the use of Clinical Decision Support Systems (CDSS) and reducing errors in clinical assessments.
4. **Reporting and Documentation-** Safeguard accuracy and consistency in documentation and reporting practices to ensure compliance and minimize mistakes.
5. **Resolving Technical Issues-** Enhance staff capability to troubleshoot and resolve technical problems efficiently, reducing system downtime and operational disruptions.

This is the matrix of the staff development program. All the thematic and survey concepts have been integrated into the staff development plan. The program will run for a total of six months, with five months dedicated to implementation and one month reserved for evaluation. This structure allows enough time for the staff to apply the concepts and strategies, followed by a thorough assessment of their effectiveness.

Matrix of the Staff Development

No.	Thematic /Survey Concept	Cluster of Themes/Survey construct	Staff Development Concept	Topic	No. of Topic	Hours	Month
1	**Ensuring Data Safety and Security Issues (DATA)**	Attributing the Accuracy of Data Entry	Data Privacy and Confidentiality Aspect	Data Accuracy	3	2 hrs./ Week x 4 =8 hrs.	January 2025
		Retrieving Information from Data Archives		Data Archival System			
		Verifying Data Information and Procedures		Data Verification Process			
2	**Enhancing Patient Care Coordination Issues (PATIENT CARE)**	Integrating Patient Information and Assessment	Patient Care Aspect	Patient Assessment	3	2 hrs./ Week x 4 =8 hrs.	February 2025
		Communicating Patient's Needs		Activities and Interventions Requirement			
		Evaluating Patient Care Coordination		Patient Care Coordination			
3	**Stabilizing the Clinical-Based Decision Making Issues (CDSS)**	Utilizing Clinical Decision Support System	Clinical Decision Support System Aspect	Clinical Diagnosis	3	2 hrs./ Week x 4 =8 hrs.	March 2025
		Impacting Patient Care Support		Assessment of Severity			
		Integrating Clinical Workflows		Clinical Management			
4	**Safeguarding Recording and Reporting Issues (REPORTING AND DOCUMENTATION)**	Confirming Robust Reporting Mechanisms	Documentation Aspect	Reporting Structure	3	2 hrs./ Week x 4 =8 hrs.	April 2025
		Ensuring Systematic Recording Protocols		Record Management			
		Controlling the Quality of Record and Reporting System		Quality Assurance			
5	**Resolving Technical Issues (TECHNOLOGY)**	Counting Technical Issue Cases	Technological Aspect	Technical Nature	3	2 hrs./ Week x 4 =8 hrs.	May 2025
		Figuring-out Severity of the Technical Issues		Incident Severity Levels			
		Figuring-out Severity of the Technical Issues		Troubleshooting Measures			
	5	15	5	15	5	40	

This Is the Gantt Chart, Showcasing The 5-Month Timeline for The Implementation of The Staff Development Program.



CONCLUSIONS

The following conclusions were drawn based on the findings of the study:

1. Five major themes were identified as essential components for the content of the EHR Quality Assurance Monitoring Tools for nurses.

These include;

- Ensuring Data Safety and Security (DATA)
- Enhancing Patient Care Coordination (PATIENT CARE)
- Stabilizing Clinical-Based Decision-Making (CDSS)
- Safeguarding Recording and Reporting (REPORTING AND DOCUMENTATION), and addressing
- Technical Issues (TECHNOLOGY)

2. The EHR Quality Assurance Monitoring Tool developed based on these five themes was proven to be both valid and reliable.
3. This tool will be highly beneficial in identifying and addressing new issues while correcting previously identified concerns. It will also serve as a comprehensive checklist to analyze and improve nursing documentation practices.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed:

1. Implementation and Regular Use of EHRQAAT
2. Training and Professional Development
3. Continuous Monitoring and Improvement
4. Policy and Procedure Updates
5. Encouraging Interdisciplinary Collaboration
6. Further Research and Development
7. Global Best Practices
8. User Feedback Mechanisms

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