

Effect of Applying an Electronic Medical Records System for Nurses on Patient Safety Cultures

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Abstract

Background: EMR systems will be of great assistance in converting the health care system from manual, paper-based processes to computerized, online ones. It will assist in delivering high accuracy, timeliness, and efficiency while using clinical information and help nurses do their jobs more effectively. The present study aims to determine the effect of applying an electronic medical record system for nurses on patient safety culture. Design: a quasi-experimental research design was used. Setting: the study was conducted in Intensive Care Units (ICU) at National Cancer Institute (NCI), Cairo University. National Cancer Institute. Sample: a purposeful sample composed of (50) ICU nursing personal. Tools: data was collected using nurse's knowledge questionnaire sheet, patient safety culture and evaluation of electronic medical record. **Results:** high statistically significant differences regarding ICU nurse's knowledge, effect in patient safety cultures and nurse satisfaction pre, post and three months post implementation of the program with P value (0.000). **Conclusion:** All ICU nurses who attended the designed training program showed a relative improvement in knowledge and perception during post and follow-up phase as compared to preprogram phase which supported the study hypothesis. **Recommendations:** Providing adequate computer training can make the transition process easier for users wary of change and will ensure that your entire team is ready use EMR and a durable record of patients' healthcare is provided through EMRs with the usage of different procedures to reduce vulnerabilities and solve problems in the modernized healthcare medical records.

Key words: Electronic Medical Records – Intensive Care Units- –Nurses perception -Patient safety cultures

Introduction

Nearly all significant organizations have made investments to computerize their daily operations in order to become more efficient, quick, intelligent, and accurate; yet, many patients are still being treated in a conventional manner. For instance, they receive handwritten lab results, prescriptions for medications, schedules, and other things⁽¹⁾. These days, it is essential to have electronic medical record systems. It will be of great assistance in converting the health care system from manual, paper-based processes to computerized, online ones. Using clinical information would facilitate the provision of higher-quality treatment to patients and medical personnel in terms of accuracy, timeliness, efficiency, and caring⁽²⁾.

Patients may find difficulties with finding their medical results and tracking their health history. They may also face some problems with setting an appointment with a doctor just to read their test results. The employees faced some difficulties when they dealt with patient's information (3).

Technology helps nurses perform their work more efficiently. It can enhance the standard of patient care documentation and data, free up storage space in the facility, improve productivity by reducing time spent looking for misplaced charts, etc., and provide nurses instant access to patient information. The use of electronic medical records enhances the delivery of healthcare by offering built-in protocols, enhancing prescription management, expanding patient education, and compiling an array of automated reports and data analysis. The EMR allows "greater and more seamless flow of information within a digital health care infrastructure, created by electronic health records (4).

Electronic medical records are to enhance the quality of care and patient safety by providing complete access to patient information to the professionals involved in care, reducing medical errors, improving care coordination, reducing workloads, and improving decision-making processes. Electronic medical records can also enhance patient safety by detecting missed diagnoses, producing diagnostic error alerts to prevent misdiagnosis, and assisting the practitioner in gathering and synthesizing patient information (5).

Electronic medical records substantially support and facilitate the daily work of health care staff and nurses through electronic data processes. With Electronic medical records systems, nurses write nursing care plans, record basic findings of patients, monitor patient laboratory results, and perform many medical record functions related to patient care nurses in all hospitals play a vital role in ensuring patient safety due to the nature of their work involving patient monitoring and coordination

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of care. The nature of the work carried out by nurses offers them various opportunities with regard to reducing adverse events and preventing errors prior to their occurrence (3).

Increasing electronic medical records use has been identified as a strategy to improve patient safety. Electronic medical records systems can help healthcare professionals and institutions organize data and improve workflows; surveys of clinicians who have adopted Electronic medical records in ambulatory care settings support a perception of improved safety. However, many clinicians using Electronic medical records often fail to utilize safety improvement functionalities, and Electronic medical records implementations can have unintended consequences, adversely impacting quality and safety. To promote use of such functionalities, the United States government has implemented standards for meaningful use (6).

Significance of the study

Electronic Medical Records (EMR) as a health information technology innovation, has been perceived to improve efficiency and increase the effectiveness of health care delivery. The database gives nurses detailed medical record information about their patients, and prescription and transcription errors are reduced. There is less need to replicate and hunt down the written version of a chart, reducing the risk of developing care plans without all relevant information.

Nurses spend a long time struggling to try to interpret an illegible physician's handwriting or colleague's documentation which enhances the quality of nursing, spend a large proportion of their working time on documenting vital signs, patient assessments, and lab results directly into a computer for easy storage and later access.

The nurses who worked in hospitals with at least a minimally functioning EMR were more likely than other nurses to report nursing excellence and quality improvement efforts in their workplace. Electronic Medical records (EMRs) are essential to improving patient safety, safety risks posed by the use of EMRs should be considered alongside the potential benefits of these systems.

Aim of the study

The aim of this study is to determine the effect of applying an electronic medical record system for nurses on patient safety culture through:

1. Assess nurses' knowledge about electronic medical record before applying the system.
2. Increase nurse's knowledge about electronic medical records.
3. Identify nurses' perception about patient safety culture before applying electronic medical record system for nurses in intensive care unit.
4. Implement of electronic medical record system for nurses.
5. Determine nurses' perception about use of electronic medical record.
6. Evaluate patient safety culture after applying the system.

Research Hypothesis

It was hypothesized that application of electronic medical records system in ICU department in National Cancer Institute by nurses will improve patient safety culture.

The subject and methods of the current study will be discussed under the following four (4) designs:

- I. Technical design
- II. Operational design
- III. Administrative design
- IV. Statistical design

I. Technical design

Research design

Quasi-experimental research design was used.

Setting study

The study was conducted in the Intensive Care Units (ICU) at National Cancer Institute (NCI), Cairo University.

Subject

All nursing personnel in intensive care units at National Cancer Institute included in the study. The Inclusion criteria were nurses who not attended pervious training about EMR.

Tools of data collection

Tool I: Nurse's knowledge Questionnaire Sheet:

It was used to assess nurses' knowledge regarding electronic medical records. It is a self-administered. It was developed by researcher guided by Schopf et al, ⁽⁷⁾, Donna et al. ⁽⁸⁾ & American Health Information Management Association ⁽⁹⁾.

It composed of two parts

Part 1: Personal data for nurses such as age, gender, level of education in nursing and work experience.

Part two: It included multiple choice questions about EMRs definition, purpose, benefit, advantage and disadvantage and uses of electronic medical records. It included (12) items. It was written in a simple Arabic language. This tool was used for pre-posttest, and follow up.

Scoring system:

The score for each item ranges from incorrect was (1) and correct was (2). The final score was classified: Scores (60% and above) was satisfactory. Scores (Less than 60%) was unsatisfactory.

Tool II: Patient Safety Culture

It was used to assess nurse's perception regarding patient safety culture. This tool developed by **Agency for Healthcare Research and Quality U.S. Department of Health and Human Services** ⁽¹⁰⁾ and was modified by the researcher.

It included **5** parts: All of these parts are multiple choices questions.

Part 1: It included (18) questions *related to work unit* such as people support one another in this unit, actively doing things to improve patient safety, make changes to improve patient safety and procedures and systems to preventing errors from happening. **Part 2:** It included (4) questions *related to unit supervisor* such as says a good word when he/she sees a job done according to established patient safety procedures, considers staff suggestions for improving patient safety and occurs pressure builds up, supervisor/manager wants nurses to work faster, even if it means taking shortcuts. **Part 3:** It included (11) questions *related to hospital* such as provides a work climate that promotes patient safety by hospital management, important patient care information is often lost during shift changes, actions of hospital management show that patient safety is a top priority and look units work well together to provide the best care for patients. **Part 4:** It included (6) questions *related to communication* items such as given feedback about changes put into place based on event reports, informed about errors that happen in this unit and discuss ways to prevent errors from happening again. **Part 5:** It included (3) questions *related to frequency of events reports* such as when a mistake is made, but is caught and corrected before affecting the patient and how often is this reported.

The score for each item was on three points Likert scale ranging from (0-2) (2) refers to agree, (1) refers to neutral and (0) refers to disagree. Positively (Scores 60% and above), Negatively (Scoreless than 60%).

Tool III: Evaluation of Electronic Medical Record

It was used to determine nurses' perception about using electronic medical records. This tool assessed their used and satisfaction with electronic medical record in their department.

It was developed by company which designed the electronic medical record system which was be implemented in the study ⁽¹¹⁾.

It included 2 parts: All of these parts are multiple choices questions.

Part 1: It included (14) questions *related to use of electronic medical records for clinical tasks in the hospital* items such as seek out specific information from patient records, enter daily notes, collect patient information for various medical declarations and obtain the results from new test or investigations. **Part 2:** It included (8) questions *related to satisfaction with the electronic medical record* such as the information content meet nurse's needs, the system provides sufficient information, get the information need in time and satisfied with the accuracy of the system. **The score for each item** was on three points Likert scale ranging from (0-2) always (2), sometimes (1) and never (0). Positively (Scores 60% and above), Negatively (Scoreless than 60%).

II- Operational Design

The operational design for this study consisted of three phase's namely preparatory phase, pilot study and filed work.

Preparatory phase

This phase included reviewing of literature related to nurse perception about electronic medical records and patient safety culture. This served to develop study tools for data collection. During this phase researcher also visited the selected places to get acquainted with the personnel and the study setting. Development of the tools was under supervision guidance and expert's opinion was considered.

Content and Face Validity and Reliability

The revision of study tools was done by a group of experts from different nursing specialized to get their suggestion about content validity and applicability of the tool. The experts were five, from Cairo University Faculty of Nursing; one professor and one assistance professor from nursing administration department. From Ain Shams University, Faculty of

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Nursing; one professor and one assistance professor from nursing administration and one expert in design of electronic medical records.

The content validity of the study procedure tools was measured to evaluate the individual items as well as the entire instrument as being relevant and appropriate to test what they wanted to measure.

The Experts were asked to evaluate individual items on the study tools in relation to its relevance and appropriateness in terms of the construct and if the items adequately measure all dimension of the construct. The experts were asked to evaluate individual items and rate items as follows: (0) refers to disagree, (1) refers to agree .

Content validity index (CVI) for the tool= 90.65% of total items rated by experts as either 3 or 4. A CVI score of 0.80 or better is generally considered to have good content validity.

The study tools were subjects to assessment of internal consistency reliability using two methods: Alpha Cronbach's test for internal consistency and test retest using Pearson's correlation coefficient (0.95).

Table (1): Content and Face Validity and Reliability

Tool	No of item	Content validity index	Face validity index	Internal consistence reliability	Test retest reliability
Knowledge questionnaire sheet	12	95.2%	96%	0.95	0.987
patient safety culture survey	42	92%	93%	0.93	0.974
Evaluation of electronic medical record	30	91.6%	92%	0.96	0.975

Pilot study

It was conducted at the beginning of the study. On (5) staff nurses (10% of total sample) to investigate the applicability, clarity of language, test the feasibility and suitability of tools, estimate the time needed to complete the questionnaires by each staff nurses and identifying potential obstacles and problem that may encountered during the period of data collection.

Collecting pilot study data lasts for two months. The time needed to fulfill nursing knowledge pre and post-test ranged between (15-20) minutes. While nurse perception (patient safety culture and electronic medical records) checklist it was ranged between (20-30) minutes. Subjects included in the pilot study were excluded from the actual study sample.

Field work

The field work of this study was executed in one year. Data collection began from February 2018 to the end of March 2019.

I-Assessment phase

The researcher started to collect data using developed tools with selected sample participants in setting according to the available time for each one after explaining to them the purpose of the study. First the researcher used nursing knowledge pre and post-test to assess nurses' knowledge about electronic medical record, this was lasted for two months. Then, the researcher assessed nurses' perception; this was lasted for four months. The researcher assessed nurse's perception in the morning and afternoon shift.

II-Implementation phase

In this phase the researcher design staffs nursing program. The sample classified to five groups; each group divided into 1 and 2. The program took 8 weeks for each group divided as three days/week, (Sunday, Tuesday and Thursday) and three hours/day from (9am- 12am) and sometimes from (1pm- 3pm) "this was determined by the director and each session was attended by 5 nurses who were selected according to unit workload and their work schedule.

As the result of repeating program 5 times the total numbers of sessions were 40 sessions with 130 hours (40 theoretical hours and 90 practical hours) allowed for achieving the program.

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At the beginning of the first session an orientation of the training program and its aim took place. Feedback was given in the beginning of each session about the previous one while taking into consideration their nurses level of education. Handouts were distributed as appropriate to staff nurse.

Teaching sessions were conducted in educational department. It composed of the four sessions as follows; the researcher met the staff nurses to explain the purpose and the benefits of the study. Knowledge questionnaire sheet was distributing to nurses for two weeks. In the beginning the researcher explained how to answer knowledge and patient safety culture survey sheet.

Session's theoretical knowledge and three session's practical. It was implemented on (5-10) nursing personnel in each session; the class includes (Five sessions). Each session divided into three parts each part lasted 1 hr. for three days per week. For knowledge need, one session for each group of nurses. The Theoretical part included: Meaning EMR, content, benefit and function of EMR, patient safety culture definition, importance in ICU, nurse role and Impact of electronic medical records in patient safety culture. The psychomotor part through asking questions such as: Electronic medical records shall be used in and electronic medical records help to development. Practical part classified into three sessions for each group of nurses.

III- Evaluation phase

The training program was evaluated to determine the extent to which staff nurses changed their knowledge and perception related to electronic medical records. Staff nurses were evaluated after implementation of the program through:

Immediate evaluation: following application of the program, staff nurses were given Nurse's knowledge Questionnaire Sheet (tool 1) to assess nurses' knowledge regarding electronic medical.

The researcher assesses nurse's perception regarding patient safety culture (tool 2) at the same the researcher distributed nurses' perception about using electronic (tool3) assessed their used and their satisfaction with electronic medical record in their department.

Follow up post program: Reassessment was done after one- and three-months later post program. The researcher used (tool 1), (too2) and (tool3) to ensure that staff nurses have developed their perception regarding electronic medical records and improve of patient safety cultures.

III. Administrative design

A letter from the researcher's faculty of nursing was sent to selected hospital director of National Cancer Institute. Cairo University to obtain their approval to conduct the study in their facility. The researcher then met the hospital director and the nurse director and explain the purpose and methods of data collection for the study.

Ethical considerations

The ethical research considerations in the research include the following:

1. The research approval was obtained from faculty nursing, Helwan University ethical committee before starting the study.
2. The researcher assured maintaining anonymity and confidentiality of the subject's data.
3. Staff nurse were informed that they were allowed to choose to participate in the study and that they have the right withdraw from the study at any time.
4. Study subject's ethics values, cultures and behavior were respected .
5. Study subjects were informed about respect purpose.

IV. Statistical Analysis

Data collected from the studied sample was revised, coded and entered using. P C. Computerized data entry and statistical analysis were fulfilled using the statistical package for social sciences (SPSS) version (20). Data were presented using descriptive statistics in the form of frequencies, percentage. Chi-square test (χ^2) was used for comparison between qualitative variables. Correlation between variables was evaluated using t-test. P values of < 0.05 were considered statistically significant (Dawson D. &Trapp G. 2001; Mallory C., Kim M. 2014).

Results

Table (1): Personal data of study sample (N =50)

Items	No	%
Age < 30	27	54%
30-40	16	32%
40	7	14%
Mean ± SD	28.58 ±0.702	
Gender Male	21	42%
Female	29	58%
Level of education in nursing		
Diploma in nursing	16	32%
Technical Institute of Nursing	32	64%
Bachelor degree in nursing	2	4%
Job title: Staff nurse	44	88%
Head nurse	6	12%
Years' work experience in currently unit		
> 15	30	60%
≤15	20	40%
Mean ± SD	14.40 ±.495	

Table (1): shows that more than half 54% of the study subject their age less than 30 years old and only 14% of them their age more than 40 years old with mean age 28.58±0.702. Regarding to gender the result reported that 58% of them were female. While regarding level of educational 64% of them were Technical Institute in Nursing and 32% of them were diploma nurse. Denoted that job title, 88 % of them were staff nurses.

As regard to years of experience in the current unit 60% of them were less than fifteen work years' experiences in the same unit with mean 14.40 ±.495.

Table (2): Percentage distribution of nurses' knowledge about electronic medical records pre, post and follow up the implementation of the program (N=50).

Nurses' knowledge	Correct	Pre	Post	follow up	Mean ± SD
1-Definition of electronic medical records	N %	6 12	40 80	43 86	1.52±.505
2-Uses of electronic medical records	N %	18 36	45 90	40 80	1.36±.485
3-Communication used of electronic medical records	N %	17 34	36 72	39 78	1.36±.485
4-Advantages of electronic medical records	N %	6 12	38 76	37 74	1.12±.328
5-Electronic medical records developed	N %	8 16	37 74	41 82	1.16±.370
6-Benefits of electronic medical records	N %	20 40	43 86	39 78	1.40±.495
7-Functions of electronic medical records	N %	22 44	39 78	40 80	1.22±.418
8-The importance of electronic medical records	N %	22 44	41 82	39 78	1.44±.501
9-Content of electronic medical records	N %	20 40	35 70	42 84	1.40±.495
10-Electronic medical records are non-personal document in case	N %	20 40	37 74	33 66	1.36±.485
11-Electronic medical records are considered a personal document in case	N %	2 4	31 62	40 80	1.40±.495
12-Effect of electronic medical records	N %	22 44	40 80	32 64	1.26±.443

Table (2): it was noted from table that about 12% of nurses knew the definition of electronic medical records pre implementation of program while the majority of them were known it post and in follow up (80% & 86%). As regard uses of electronic medical records about 36% of nurses knew it pre implementation the program while the majority of them were known it post and in follow up (90% & 80%). Related to communication of electronic medical records only 34% of nurses knew it pre implementation the program while the majority of them were known it post and in follow up (72% & 78%). As regards to advantage of electronic medical records only 12% of nurses knew it pre implementation the program while the majority of them were known it post and in follow up (76% & 74%).

Meanwhile regarding benefits of electronic medical records about 40% of nurses knew it pre implementation while the majority of them were known it post and in follow up (86% & 78%). Related to functions of electronic medical records only 44% of nurses knew it pre implementation the program while the majority of them were known it post and in follow up (78% & 80%). In addition, the importance of electronic medical records only 44% of nurses knew it pre implementation the program while the majority of them were known it post and in follow up (82% & 78%). On the other hand, only 4% of nurses considered electronic medical records a personal document in pre implementation the program while the majority of them were not considered it in post and follow up (62% & 80%). Finally, 44% of nurse knew the effect of electronic medical records pre implementation the program while the majority of them were known it post and in follow up (80% & 64%).

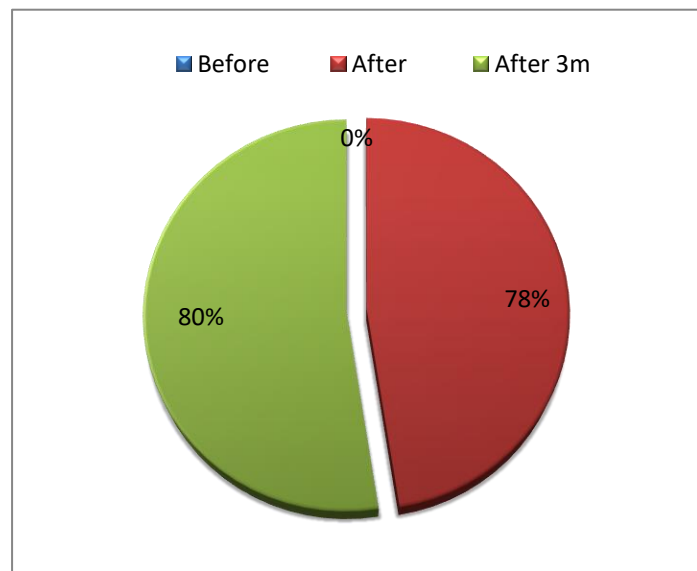


Figure (1): Percentage distribution of nurse's knowledge regarding electronic medical records pre, post and follow up the implementation of the program (N=50).

Figure (1): illustrated that nurses' knowledge regarding electronic medical records was unsatisfactory pre implementation of training program. While (80% & 78%) of the study sample were satisfactory in post and follow up respectively. There is a highly statistically significant difference between pre, post and follow up the program implementation ($P < 0.001$).

Table (3): Distribution of the study sample regarding total score of nurses' perceptions about "work area" in per, post and follow up the implementation of the program (N=50).

Work area	Pre		Post		Follow up		X ²	P
	N	%	N	%	N	%		
Positive	6	12	32	64	30	60	24.04	<0.001
Negative	44	88	18	36	20	40		

** Highly statistically significant at p<0.001

Table (3): Describes that most of them (88%) perceived patient safety culture regarding work area negatively pre implementation of the program, while post and in follow up about two third of them (64% & 60%) respectively perceived it positively.

Table also describes that there is statistically significant relation between nurses' perception and work in as p<0.001

Table (4): Distribution of the study sample regarding total score nurses' perception about "manger/ supervision" in per, post and follow up the implementation of the program (N=50).

Manger/ Supervision	Pre		Post		Fu		X ²	P
	N	%	N	%	N	%		
Positive	19	38	37	74	36	72	20.35	<0.001
Negative	31	64	13	26	14	28		

** Highly statistically significant at p < 0.001

Table (4): Describes that (64%) of nurses` perceived patient safety culture regarding manger / supervision negatively pre implementation of the program, while (74% & 72%) of them perceived manger/ supervision positively post and in follow up respectively.

Table also describes that there is statistically significant relation between nurses' perception and manger/supervisor as p<0.001.

Table (5): Distribution of the study sample regarding total score nurses' perception about in hospital per, post and follow up the implementation of the program (N=50).

In hospital	Pre		Post		Follow up		X ²	P
	N	%	N	%	N	%		
Positive	11	22	30	60	30	60	26.88	<0.001
Negative	39	78	20	40	20	40		

**Highly statistically significant at p < 0.001

Table (5): Shows that (78%) of nurses` perceived patient safety culture regarding in hospital negatively pre implementation of the program, while (60% & 60%) of them perceived in hospital positively post and in follow up respectively. Table also describe that there is statistically significant relation between nurses' perception and in hospital as p<0.001

Table (6): Distribution of the study sample regarding total score nurses' perception about "communication" in per, post and follow up the implementation of the program (N=50).

Communication	Pre		Post		Follow up		X ²	P
	N	%	N	%	N	%		
Positive	16	32	27	54	35	70	24.08	<0.001
Negative	34	68	23	46	15	30		

** Highly statistically significant at p<0.001

Table (6): Describes that most of them (68%) perceived patient safety cultures regarding communication negatively pre implementation of the program, while (54% & 70%) of them perceived Communication positively post and in follow up implementation the program.

Table also describes that there is statistically significant relation between nurses' perception and communication as p<0.001.

Table (7): Distribution of the study sample regarding total score nurses' perception about "frequency reported of events" per, post and follow up the implementation of the program (N=50).

Frequency reported of events	Pre		Post		Follow up		X ²	P
	N	%	N	%	N	%		
Positive	30	60	32	64	28	64	24.72	<0.001
Negative	20	40	18	36	22	44		

** Highly statistically significant at $p < 0.001$

Table (7): Describes that 60% of nurses perceived patient safety culture regarding frequency reported of events positively and 40% negatively pre implementation of the program, while (64% & 64%) of them perceived frequency reported of events positively post and in follow up respectively. Table also describe that there is statistically significant relation between nurses' perception and frequency report of events as $p < 0.001$

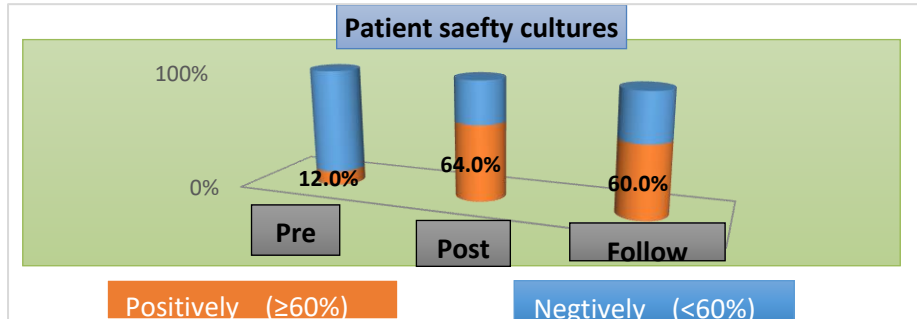


Figure (2): Percentage distribution of nurse's perception about patient safety cultures pre, post and follow up phases of the program (N=50).

Figure (2): showed that nurse's perception about patient safety cultures were negatively 88% pre implementation of training program. While post and follow up implementations of the program more than two third of them (64% & 60%) were perceived patient safety culture positively.

Table (8): Distribution of the study sample regarding total score of nurses' perception about uses of EMRs for clinical tasks in the hospital in post and follow up phases (N=50).

Nurse perception about uses of EMRs for clinical tasks in the hospital	Post		Follow up		X ²	P
	N	%	N	%		
Positively	41	82	42	84	17.05	<0.001
Negtively	9	18	8	16		

** Highly statistically significant at $p < 0.001$

Table (8): Describes that most of nurses perceived electronic about medical record regarding clinical tasks in the hospital positively (82% - 84%) post and in follow up implementation of training program respectively. Table also describe that there is statistically significant relation between nurses' perception and uses of EMRs for clinical tasks in hospital as $p < 0.001$.

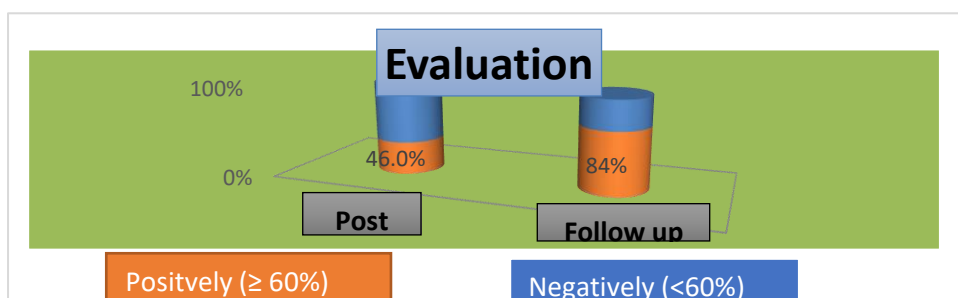
Table (9): Distribution of the study sample regarding total score of Nurses' satisfaction about using the EMRs in post and follow up phases (N=50).

Nurses' satisfaction about using the EMRs	Post		Follow up		X ²	P
	N	%	N	%		
Positively	44	88	42	84	0.950	<0.001
Negtively	6	12	8	16		

** Highly statistically significant at $p < 0.001$

Table (9): Describes that most of nurses perceived uses of EMRs regarding satisfactions positively (88% - 84%) post and follow up implementation of the program, respectively.

Table also describe that there is statistically significant relation between nurses' satisfaction and uses of EMRs as $p < 0.001$.



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Figure (3): Distribution of the study sample regarding total score of Nurses' satisfaction about using the EMRs in post and follow up phases (N=50).

Figure (3) showed that nurse's perception about using the Electronic medical records were negatively (54%) post implementation of training program. While in follow up implementations of the program more than third of them (84%) were perceived patient safety culture positively.

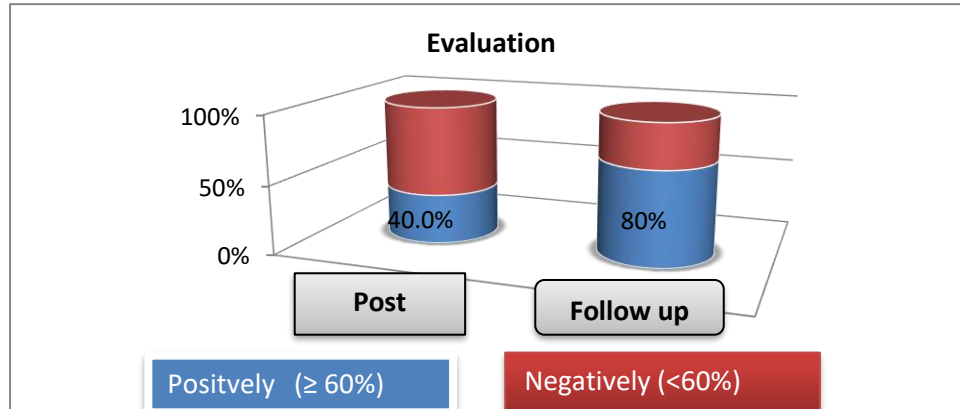


Figure (4): Distribution of the study sample regarding total score of Nurses' perceptions about using the EMRs (clinical uses and satisfaction) in post and follow up phases (N=50).

Figure (4): showed that nurse's perception about using the Electronic medical records were negatively (60%) post implementation of training program. While in follow up implementations of the program (80%) of nurses were perceived patient safety culture positively.

Discussion

The primary drivers of the demand for electronic medical records (EMRs) have been identified as increasing patient care and safety. The benefits of EMRs to healthcare organizations include increased efficiency, accuracy, accessibility, and safety.

According to the current study, more than 75% of the study sample was happy with electronic medical records. This finding is consistent with a study by Zaman et al. ⁽¹²⁾ that showed healthcare workers could utilize EMRs effectively with the right knowledge and training. Furthermore, a strong body of research indicates that a nurse's attitude toward the EMR system influences how well the system is implemented. They would see the system more favorably if they had better access to training, better documentation procedures for nurses, and software updates. From the perspective of the researcher, the nurses' perception and readiness assessment gives a correct picture of the current circumstances and an explanation of the functional methods and aided operational strategies for the effective adoption of electronic medical records.

The present study revealed that two thirds of the study sample had a good perception of the workplace's patient safety culture. According to a study by Awol et al. ⁽¹³⁾ who found that improved work environments enable nurses to deliver the best care possible, patient errors are more likely to be identified and reported, improving the quality of nursing care. However, altering the work environment of nurses may be counterproductive in addressing concerns related to patient safety. From the researcher's point of view nurses working in a favorable environment are provided adequate organizational and structural support, participate in shared decision making, have adequate control over their nursing practice and are supported to form collegial relations with members of the health team these elements are known to optimize nurses' job performance and engagement, resulting in heightened job satisfaction.

The present study found more than two third of study sample were perceiving patient safety cultures positively regarding supervision/manger. Similarly, with study conducted by Lee and Dahinten ⁽¹⁴⁾ who emphasized that the need for supervisors to engage staff on patient safety-related issues as it promotes a sense of ownership and accountability among staff towards ensuring that patient safety measures are implemented, leadership support is crucial in developing, implementing and sustaining patient safety culture.

A good perception of hospital patient safety cultures was reported in two thirds of the research group. In agreement with study done by Lilis et al. ⁽¹⁵⁾ who stressed that patient's safety should be adopted to give patient care services in a safe environment which might provide a better knowledge of group dynamics and individual attitudes of patient safety culture. From the researcher's point of view supervisors should give feedback about changes that should be put into place based on event reports; they are informed from their supervisors the errors that happen in their units and work with each other to solve these errors.

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The present study found more than two third of study sample were positively perceived patient safety cultures in communication. Similarly, with study conducted by Lee and Dahinten ⁽¹⁴⁾ who revealed that professional communication is important for patient safety. Professional communication would increase the levels of patient safety and enhance the quality of patient care, effective communication and teamwork in promoting positive patients' outcomes is crucial. From the researcher's point of view essential that nurses have the perception of discussing freely when observing something that could affect the patient.

The present study found more than two third of study sample were positively perceived patient safety cultures regarding frequency reported of event. Likewise, with study conducted by Qasim et al. ⁽¹⁶⁾ who revealed that administration backing is important and demanding the utilization of a tool for notifying events in order to foster patient safety instead of punishing nurses for reporting incidences. From the researcher's point of view improving nurses' attitudes toward incident reporting should be accomplished through a fortified leadership commitment to patient safety, improvement of nurses' staffing, incident reporting system training, the routine promulgation of incident analysis results, an appreciation and assurance of confidentiality for nurses reporting incidents and improved mutual support among nurses regarding incident reporting.

In this study, it was observed that a majority, specifically two-thirds, of the study participants exhibited favorable perceptions of patient safety cultures. This outcome aligns with the findings of a study conducted by Baillieu et al. ⁽³⁾, which underscored the significant potential of electronic medical records in enhancing healthcare. The authors emphasized the capacity of electronic medical records to contribute to the improvement of healthcare by enabling swift and precise transmission of patient data, standardizing medical procedures, aiding decision-making processes, and facilitating real-time prevention of medical errors. From the researcher's point of view EMR system can improve patient outcomes by enhancing healthcare providers' ability to work efficiently and effectively.

The present study found more than three quarter of study sample were positively perceived using EMRs. These results were in agreement with study conducted by Xiaolan et al. ⁽²⁾ who identified that the strongest predictor of overall satisfaction was the quality of information, particularly when it was up-to-date, accurate, complete and available when needed. Likewise, with study conducted by Hategeka et al. ⁽⁵⁾ who revealed that EMRs that support nursing workflow may help prevents positive deviance, the phenomenon of nurses actively working around the EMR when the system does not match their needs. From the researcher's point of view the nurses did think more negatively about the usability of the information in the EMR system. For the most part, the nurses thought positively about the EMR system. They think it will likely lessen their paperwork, improve their ability to monitor patient progress and decrease their workload overall.

Conclusion

Based on the results of the present study it can be concluded that:

Two third of the studied sample perceived patient safety cultures positively in post and in follow up program implementation. Also, more than three quarter of the studied sample perceived using the Electronic medical post program implementation positively.

Recommendations:

Healthcare Organizations

- Providing adequate computer training programs can make the transition process easier for users wary of change.
- Should be become one of the items for assessing the performance of nurses using EMR efficiently.
- Should promulgate uniform standards for data and security to facilitate implementation of the EMR and its secondary databases.

Further studies

- Determine the effect of developing EMRs on nurse's productivity.
- Challenges facing implementation of EMRs in health care organization quality
- Perform periodically evaluate printed records from the perspective of an auditor or expert witness

Educational department of the organization should be:

- Periodical training is crucial to acquire nurses with different modules that need to be learned such as scanning, charting data entry, electronic prescriptions, lab results and EMR dictation training.
- Design, implement and evaluate training program to fulfil staff nurses' training needs
- Encourage staff nurses to participate in research activities that is related to electronic medical records

Administration

- Applying computer technologies to this information management challenge (financial and administrative).

References

1. Muhammad, S., Anwar, A., Al-Hussainan, A., Farah, M., & Hanouf, A. (2020). An Electronic Medical Record System January Automation and Connectivity in Healthcare: 2020 International Journal of Extreme, 2(1), 68-102. DOI:10.4018/IJEACH.2020010105.
2. Xiaolan, H., Caia, S., Huangb, X., & MacXueling, Z. (2021). The design of electronic medical records for patients of continuous care Journal of Infection and Public Health, Volume 14, Issue 1, January 2021, Pages 117-122, Journal of Infection and Public Health
3. Baillieu, R., Hoang, H., Sripipatana, A., Nair, S., & Lin, S.C. (2020). Impact of health information technology optimization on clinical quality performance in health centers: a national cross-sectional study. PLoS ONE. 2020, 15, e0236019.
4. Brown, J., Pope, N., Bosco, A.M., Mason, J., & Morgan, A. (2020). Issues affecting nurses' capability to use digital technology at work: An integrative review. J Clin Nurs 2020, 29.2801-19. 10.1111/jocn.15321
5. Hategeka, C., Ruton, H., Karamouzian, M., Lynd, L.D., & Law, M.R. (2020). Use of interrupted time series methods in the evaluation of health system quality improvement interventions: a methodological systematic review. BMJ Glob Health, 5(10), e003567.
6. Carroll, W. M. (2020). Emerging technologies and healthcare innovation. Emerging technologies for nurses—Implications for practice: (pp. 13-16). NY, NY: Springer Publishing Company
7. Schopf, T. R., Nedrebø, B., Hufthammer, K. O., Daphu, I. K., & Lærum, H. (2019). How well is the electronic health record supporting the clinical tasks of hospital physicians? A survey of physicians at three Norwegian hospitals. BMC health services research, 19(1), 1-9.
8. Donna, D., Ignatavicius, W., & Linda, M. (2016). Medical-Surgical Nursing—Two-Volume Text and Adaptive Learning (Access Card) Package. Elsevier-Health Sciences Division.
9. American Health Information Management Association (2017). 89th AHIMA Convention and Exhibit 2017 - American Health Information Management Association. Available at: <https://healthmanagement.org/c/it/event/89th>. Last accessed June 2023.
10. Agency for Healthcare Research and Quality U.S. Department of Health and Human Services (2016). National healthcare quality & disparities [cited 2016 Jan] Available from: www.ahrq.gov/research/findings/nhqrd/index.html.
11. Ramoo, V., Kamaruddin, A., Nawawi, W. N. F. W., Che, C. C., & Kavitha, R. (2023). Nurses' Perception and Satisfaction Toward Electronic Medical Record System. Florence Nightingale Journal of Nursing, 31(1), 2.
12. Zaman, N., Goldberg, D.M., Abrahams, A.S., & Essig, R.A. (2020). Facebook Hospital Reviews: Automated Service Quality Detection and Relationships with Patient Satisfaction. Oct; 9(10): 1369.
13. Awol, SM., Birhanu, AY., Mekonnen, ZA, et al. (2020). Health professionals' readiness and its associated factors to implement electronic medical record system in four selected primary hospitals in Ethiopia. Adv Med Educ Pract. 2020; 11:147–154. doi:10.2147/AMEP.S233368
14. Lee, S.E., & Dahinten, V.S. (2021). Using dominance analysis to identify the most important dimensions of safety culture for predicting patient safety: Int. J. Environ. Res. Public Health 2021, 18, 7746.
15. Lilis, S., Santhna, L., & Faridah, B. (2020). Patient Safety Culture in Nurses in Karawang, Indonesia: A Cross-Sectional Study. in The International Virtual Conference on Nursing, KnE Life Sciences, pages 165–174. DOI 10.18502/cls.v7i2.10299
16. Qasim, Al., Loai, Ab. & Omar, S. (2020). Predictors of perceptions of patient safety culture and frequency of event reporting by critical care nurses in Oman: a model-building approach. February 2020. 22(4):230.

