

## Designing and Implementing Electronic Health Records Software for Intern-Nurses by Using Advanced Mobile Devices

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### Abstract

Technology is increasing the complexity in the role of today's nurse. Healthcare organizations are integrating more health information technologies and relying on the electronic health record for data collection, communication, and decision making. Nursing faculty need to prepare graduates for this environment and incorporate an academic electronic health record into a nursing curriculum to meet student program outcomes. Although the need exists for student preparation, some nursing programs are struggling with implementation, whereas others have been successful. To better understand these complexities, designing and implementing electronic health records software for intern-nurses by using advanced mobile devices. A quasi-experimental design was utilized. This study was conducted at Benha University Hospital. 60 intern-nurses were chosen randomly to be included in this study. Data of the present study was collected by using three tools; (1) Intern-Nurses' Knowledge Questionnaire, (2) Intern-Nurses' Technological Skills (Observational checklist) and (3) Intern-Nurses' Attitude Questionnaire. The highest percentage of intern-nurses had a good knowledge about AMEHRs, highly acceptable level of technological skills for using EHRs software, and positive attitude toward AMEHRs software throughout immediate post and follow up from the preprogram implementation phases. The study concluded that there was highly statistically significant positive correlation between their knowledge regarding AMEHRs software with their technological skills required for toward using AMEHRs software, with total performance scores and attitude toward AMEHRs software at pre-program, immediate post and follow up program implementation phases. The study recommended that; Academic nurse leaders should establish nursing informatics skills for nursing students and nurses by continuing education, training and classroom teaching with practical classes. Also need to integrate IT based NI into the nursing theory and practical session in order to improve nursing informatics skills and address unwarranted variations and enhance outcome.

**Key words:** academic mobile electronic health records (AMEHRs)- Advanced mobile devices (AMDs)- intern-nurses performance.

### 1.Introduction

Documentation is one of the most crucial aspects of nursing care, as reflected in the old nursing adage, "If it wasn't charted, it wasn't done". Nurses in an acute care medical surgical unit spend approximately 147 minutes charting in a typical 10-hour shift. The electronic health record (EHR) is where this important collection of data, information, knowledge and eventually wisdom resides. Nursing education, however, has not kept pace with the need for nursing students to learn how to use this valuable tool. Nursing students have limited access to EHRs in prelicensure programs. Nurse faculty and nursing students' attitudes and perception toward health information technology in nursing education have been studied, yet concrete descriptions and procedures for implementing technology are lacking (3)

In some nursing programs, students are not exposed to electronic documentation until they participate in clinical rotations in local hospitals. Unfortunately, during clinical rotations, it is not easy for students to learn about best practices in electronic documentation. However, students can learn to navigate EHRs in simulation labs. It has reported partnering with a medical center to

provide students access to training with EHRs before the first clinical rotation. These students felt more confident with their documentation. In addition to educating students in a transitional electronic environment is no longer optional for nursing faculty. It is necessary for accurate documentation, transmission, and management of data for improving patient care (5).

The wide adoption of EHR systems has led the Institute of Medicine (IOM) to emphasize the use of informatics as a core competency required of all health care professions. The 2009 Health Information Technology for Economic and Clinical Health Act (HITECH) directs all health providers to use EHRs. The National League for Nursing (NLN) recommends that nursing faculty should incorporate informatics into all levels of the curriculum. However, the nursing profession has been slow to incorporate information technology into formal nurse education and practice (23).

Moreover most nursing schools continue to educate students in traditional ways. For instance, when nursing faculty teach nursing documentation to undergraduate nursing students in clinical settings, the first major teaching strategies for documentation include

the use of paper. Nurses have used paper-based forms for nursing documentation, including narrative notes and flow sheets, to exchange pertinent patient information. Similar to paper-based documentation, EHRs contain flow sheets. However, EHR also incorporates new features, help nurse's practice better nursing care, supporting standard nursing terminology, incorporating clinical documentation from various sources, supporting standard care plans, guidelines, and protocols, supporting drug interaction checking, presenting alerts for preventive services and wellness, and linking clinical tasks. These features may alter how nurses document, make decisions, and communicate with other healthcare providers (9).

Computerized medical record systems, commonly referred to as EHR or EMR, and were introduced in clinical settings in the early 1960s. Since then, the adoption rate of EMR systems has continuously increased. While EHRs have been widespread, the nursing education curriculum is faced with challenges related to EHR use in clinical practicum. One of the possible reasons is that computers are either accessible only at fixed sites or restricted due to the volume of users and there are other barriers described physical barriers, such as a lack of space and the lack of EMR workstations for students at practicum sites. Another barrier was that students have access to the EMR computer without appropriate permissions to input information because of practical and liability issue (18)

Moreover various studies showed that new technologies, such as ubiquitous mobile devices and health information technology systems, used at hospitals and outpatient clinics can be integrated into clinical practicum curricula. Most nurses and nursing undergraduates regarded mobile devices as useful in accessing necessary information, making notes, saving time, and increasing self-confidence, as well as in improving patient safety and quality of care (24)

Mobile technology are portable and are updated frequently, as compared to textbooks which become obsolete quickly has the potential to enhance nursing practice through nurses being able to find or check information about illness, disease or injury, view or revise procedures or care to be undertaken, or ensure correct medications are administered to patients without needing to go to the nurses' station, treatment room or locate a computer terminal to retrieve information (25)

The concept of mobile electronic medical record (MEMR) systems: is expected to be one of the superior approaches for improving

nurses' bedside and point of care services. EHR: health record of an individual that is accessible online from many separate, interoperable automated systems within an electronic network. EHR: an electronic method of storing, manipulating and communicating medical information of all kinds including text, images, sound, video and tactile senses, which are more flexible than paper-based systems. Often referred to as a medical record, it contains a client's (patient) entire medical history and information crucial to future care. Electronic documentation: a document existing in an electronic form to be accessed by computer and any type of mobile information technology (8)

With EHRs health care team members are able to capture patient information of different disciplines, and share the information to promote better patient care management and outcomes, eliminate unnecessary and duplicate tests, and to reduce medical errors. Various studies have shown that using EHRs has improved patient safety, increased the quality of care, and reduced health care costs. In addition, the data in EHRs is considered a significant resource for clinical evidence that has been used for evidence based practice research in multidiscipline. However, several studies suggested that poor understanding of EHR's functionality may lead to medical errors (17)

With EHRs, the transfer of complete records from provider to provider or facility to facility happens electronically. That also means records don't get lost or delayed when patients change providers or providers make referrals Therefore, healthcare professionals need to be trained to be knowledgeable and have a true understanding of the use of EHRs to prevent medical errors and improve the quality of patient care (13).

## 2.Aim of the study

Designing and implementing electronic health records software for intern-nurses by using advanced mobile devices

## 3.Subject and Method

### 3.1Research design

A quasi-experimental design with pretest, posttest and follow up assessments was used to achieve the aim of the present study

### 3.2Setting

The present study was conducted at Benha University Hospital (Free services hospital) which includes medical and surgical clinical departments where the intern-nurses were trained.

### 3.3Sample

The subjects who participated in this study were composed of representative simple

random sample consisted of 25% of intern-nurses of Benha Faculty of Nursing who were enrolled in the internship year 2019/ 2020 at Benha University Hospital and having advanced mobile device . The total number of intern-nurses was 220 intern-nurses at the time of the study, so the actual number of intern-nurses included in this study was (60) chosen randomly.

### Tools for data collection

#### Tools of data collection

Data of the present study was collected by using the following three tools;

Intern-Nurses' Knowledge Questionnaire: (Appendix I)

Self-administered questionnaire was developed by the researcher based on literature review (Hassan & Mostafa, 2009; Ajibade, Oladeji, & Okunlade, 2013; Dall, 2014; Akpabio, & Ella, 2015; Pordeli, 2017 ;Rashed, 2018) to assess intern-nurses' knowledge about electronic health records software by using advanced mobile devices it used before, immediately post and follow up three months

**Table (1)** The second part: Self-administered questionnaire was developed by the investigator. It consisted of (92) questions and divided into 3 sections distributed as follows

Question type		True or false	Multiple choice	Total
Section content				
Knowledge about NI	13		16	29
Knowledge about AMDs	13		9	22
Knowledge about EHRs	22		19	41
Total	48		44	92

### Scoring system

The scoring system for intern-nurses' knowledge was calculated as follows; (1) score for correct answer, and (0) for incorrect. The score of the items was summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score.

The total knowledge score (92 degrees)

- Adequate knowledge if the percentage score  $\geq 60\%$  (55- 92 degrees)
- Inadequate knowledge if the percentage score is  $< 60\%$  (0 < 55 degrees)

### Reliability

This tool was tested for reliability to estimates the consistency of measurement. Reliability was done using Alfa Coefficient test was 0.86.

Intern-Nurses' Technological Skills (Observational checklist): (Appendix II)

Observational checklist was developed by the researcher based on scientific literature review (Tiger Initiative. 2009; Ghoneimy, 2015; Adeleke, Salami & Achinbee, 2015;

after implemented of training program. It consisted of two parts as follows:

The first part: It included intern-nurses' personal data and divided into the following 3 sections:

Section1:It consisted of 10 questions about personal characteristics of nursing staff; (age, gender, marital status, Place of living (residence), Pre-university education, do you have a computer, how would you rate your computer literacy skills, Have Medical Apps installed on your mobile device, do you think hospital employers should establish policy for personal communication devices use ,In general, how do you feel about advanced mobile devices (cell phone, smartphone or tablet computer)).

Section2:It consisted of 11 questions about previous AMDs utilization in learning and academic training

Section3: It consisted of 7 questions about previous experience and utilization of any type of AMDs or desktop computer.

Pordeli, 2017; Rashed, 2018). It included two parts:

The first part: Intern Nurses' Technological Skills Observational Checklist: It include different items to assess intern-nurses' technological skills for using electronic health records software by using advanced mobile devices before, immediately post and follow up after three months implemented of training program. It consisted of "31" items that grouped under two categories:

Technological skills required for using EHRs: It covered "25" items such as (use search engine and accessing the internet and etc....).

Informatics literacy and management skills: It covered "6" items such as (navigate electronic health record and etc....).

### Scoring system

The scoring system for Intern nurses' technological skills was calculated according to a three-point likert scale ranges from: not done (0 point), incompletely done (1 point) and completely done (2 points). The total score was

"62" degree and cut point was done at 60% = 37scores. A total score was calculated by summing up the grades of items of checklist, the scores were converted into percent score. The level of practice was determined as the following:

- Highly acceptable (High level) if the percentage score is  $\geq 75\%$  ( 75% (47 - 62 degrees ),
- Acceptable (Moderate) level if the percentage score equals 60 - < 75 % (from 37 < 47 degrees)
- Unacceptable (Low level) if the percentage score if the percentage score is < 60 % (0 < 37degrees)

The second part: Intern-Nurses' Performance Observational Checklist (Data entry): It include different items to measure intern-nurses' actual performance before, immediately post and follow up after three months implemented of training program. It covered 14 items such as (using the keyboard and having good typing skill and etc....).

#### Scoring system

The scoring system for Intern-nurses' performance (Data entry) was calculated according to a three-point likert scale ranges from: not done (0 point), incompletely done (1 points) and completely done (2 points). The total score was "28" degree cut point was done at 60% = 14 scores. A total score was calculated by summing up the grades of items of checklist, the scores were converted into percent score. The level of performance was determined as the following:

- Highly acceptable (High level) level if the percentage score is  $\geq 75\%$  ( 75% (18- 28 degrees ),
- Acceptable (Moderate level) if the percentage score equals 60 - < 75 % (from 14 < 18 degrees)
- Unacceptable (Low level) if the percentage score if the percentage score is < 60 % (0 < 14 degrees)

#### Reliability

This tool was tested for reliability to estimates the consistency of measurement. Reliability was done using Alfa Coefficient test was 0.90.

Intern-Nurses' Attitude Questionnaire: (Appendix III)

A structured questionnaire was developed by the researcher based on scientific literature review (Suppiah Dall, 2014; Olok, Yagos, & Ovuga, 2015; Wang, Ho, & Chen 2015; Zamarripa-Zoucha, 2015; Ismail, 2017; Andrew, Taylorson, & Langille 2018; Choi, 2018; Gajanayake, Sahama, T., & Iannella). It

consisted of "86" items to determine intern-nurses' attitude toward using electronic health records software by using advanced mobile devices before, immediately post and follow up after three months implemented of training program divided into 7 dimensions distributed as follows;

1st dimension optimism (7 items), 2nd innovation (7 items), 3rd discomfort (7 items), 4th insecurity (9 items), 5th usefulness (18 items), 6th satisfaction (20 items), 7th access to information (11 items) and 8th preference (7 items).

#### Scoring system

The scoring system for Intern-nurses' attitude was calculated according to a three-point likert scale ranges from: disagree (0 point), uncertain (1 points) and agree (2 points). The score was reversed for negative items. Scores of each dimension summed up and converted into percent scores.

Each intern- nurse chooses only one best answer after reading and understanding the items carefully. Finally, the answer was assigned numerical values according to the following scores that reflect intern- nurses' attitude toward using electronic health records software by using advanced mobile device

The total attitude score (172 degrees)

- positive attitude if the percentage score is  $\geq 75\%$  (129 - 172 degrees ),
- Negative attitude if the percentage score if the percentage score is < 60 % (1 < 103 degrees)

#### Reliability

This tool was tested for reliability to estimate the consistency of measurement. Reliability was done using Alfa Coefficient test was 0.98.

#### Ethical considerations

The study protocol was approved by the research and ethics committee at the Faculty of Nursing Benha University. Intern- nurses were informed about their rights to withdraw from the study at any time without the need for giving any reason. Also they were assured that the information will be utilized for scientific research only. A verbal consent for participating in the study was also obtained from intern-nurses. In addition, confidentiality and anonymity of the subjects were ensured through coding of all data.

#### III-Administrative design

An official approval was obtained from the Dean of Faculty of Nursing Benha University and the hospital director of Benha University Hospital through official letters explaining the aim of the study to request permission to conduct the study (Appendix VIII). Assured complete confidentiality of the

obtained information, and the study would not affect in any way the work or jeopardize patient care, official permission for data collection and implementation of the program were obtained.

#### IV-Statistical design

Data were verified prior to entry into the computer. The Statistical Package for Social Sciences (SPSS version 20) was used for that purpose, followed by data analysis and tabulation. Descriptive statistics were applied (e.g., mean, standard deviation, frequency and percentages). The statistical tests were used as Paired (t) test was used to compare mean scores between the same sample at different study phases while Chi square was used for number and percent distribution, and Spearman correlation test (r) was used to define correlation among socio-demographic characteristics and the study sample at different study phases. A highly significant level value was considered when  $p \leq 0.001$ , while a significant level value was considered when  $p \leq 0.05$ , and insignificant when  $p > 0.05$ .

#### Limitations of the study

The researcher was confronted with a few obstacles during the implementation of the study as:

- The time for giving the session for intern-nurses who were distributed in different units was difficult to be organized.
- Obtaining training classes in some time were so difficult because the student of faculty of medicine were using these training classes.
- Obtaining a patient file was difficult because the nursing staff work load add to the fact that the ticket is not organized and the patient information is unclear and incomplete.
- There were some problems with internet connections, such as the speed or the absence of a mobile signal where they were staying.
- The difficulty of downloading the application due to the speed the internet because it is an internet package and internet memory stick (Internet flash) and the cost to the researcher Net package. Which lead to distribution of the intern-nurses group into subgroups and sometime intern-nurses were requested to complete the EHRs sheet in the home as the availability of Wi-Fi connection and send them back to the researcher to complete the observation.

#### 4.Results

**Table (1):** This table shows that nearly more than half of intern-nurses (56.7 %) had

age more than 22 years old with Mean  $\pm$  SD (22.33 $\pm$ .54), the majority of intern-nurses (80.0 %) were female, more than three quarters of intern-nurses (76.7%) were single and all intern-nurses (100%) have Medical Apps installed on their mobile device. In relation to their place of living, the highest percent of inter-nurses (90%) are living at rural areas. In regarding to their thought that hospital employers should establish policy for personal communication devices use the majority of them (83.3 %) thought that hospital employers should establish policy for personal communication devices use.

**Figure (1):** Illustrates that half of intern-nurses (50.0%) had positive feeling level toward AMDs utilization in clinical practice and one third of them (30.0%) had strongly positive feeling level toward AMDs utilization in clinical practice. While fifth of them (20.0%) had negative feeling level toward AMDs utilization in clinical practice

**Figure (2):** Clearly indicates that there was a highly significant improvement in knowledge levels regarding electronic health records software after intervention both post and follow up phases after three months of program from the preprogram phase. The majority of intern-nurses (78.3 %) had inadequate knowledge scores about electronic health records software utilization in clinical practice at pre-program implementation phase before intervention. While the highest percent of them (90%) had adequate knowledge scores about electronic health records software utilization in clinical practice at immediate post program implementation phase

**Figure (3):** Clearly shows that there was a highly significant improvement in intern-nurses' technological skills for using electronic health records software after intervention both post and follow up phases after three months of program from the preprogram phase. Moreover nearly two thirds of intern-nurses (58.3 %) had unacceptable technological skills at pre-program implementation phase before intervention. While the highest percentage of intern - nurses had highly acceptable technological skills level at follow up phase and immediately post-program implementation phase (83.3% & 76.6%) respectively.

**Figure (4):** Clearly illustrate that there was a highly significant improvement intern-nurses' attitude toward electronic health records software level after intervention for both post and follow up phases after three months of program from the preprogram phase. More than half of intern-nurses (55.0 %) had a negative attitude toward electronic health records software at pre-program

implementation phase before intervention. While the highest percentage of intern - nurses had a positive attitude toward electronic health records software at follow up and immediately post-program implementation phases (86.7% & 85.0%) respectively.

**Table (2):** Frequency distribution of studied intern-nurses personal data regarding personal characteristics (No= 60)

Personal characteristics	No	%
Age		
Less than 22	26	43.3
More than 22	34	56.7
Mean $\pm$ SD 22.33 $\pm$ .54		
Gender		
Male	12	20.0
Female	48	80.0
Marital status		
Single	46	76.7
Married with children	8	13.3
Married without children	6	10.0
Place of living (residence)		
Urban	6	10.0
Rural	54	90.0
Pre-university education		
Secondary school	41	68.3
Technical nursing diploma	19	31.7
Do you have a computer		
No	17	28.3
Yes	43	71.7
Have Medical Apps installed on your mobile device?		
No	0	0.0
Yes	60	100.0
Do you think hospital employers should establish policy for personal communication devices use?		
No	10	16.7
Yes	50	83.3

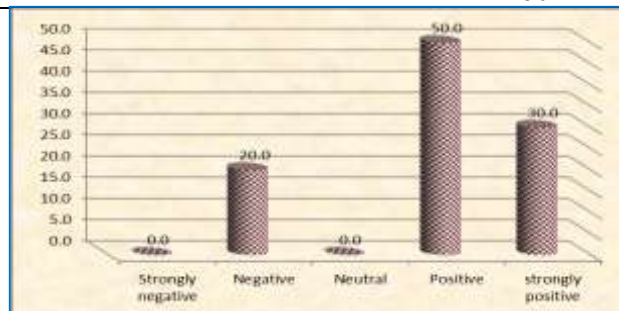


Fig1:Percentage distribution of intern-nurses' feeling levels toward AMDs utilization in clinical practice

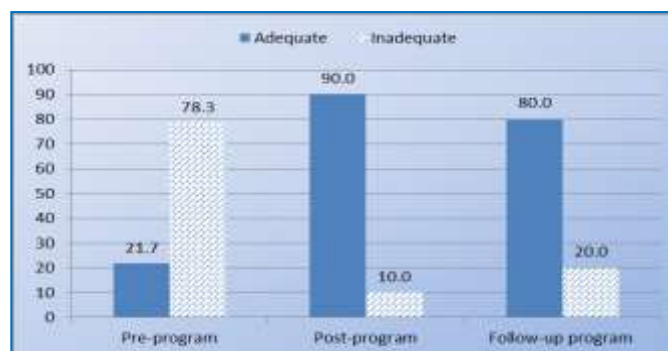


Fig2:Percentage distribution of the Studied intern-nurses' total knowledge levels regarding electronic health records software throughout the program phases

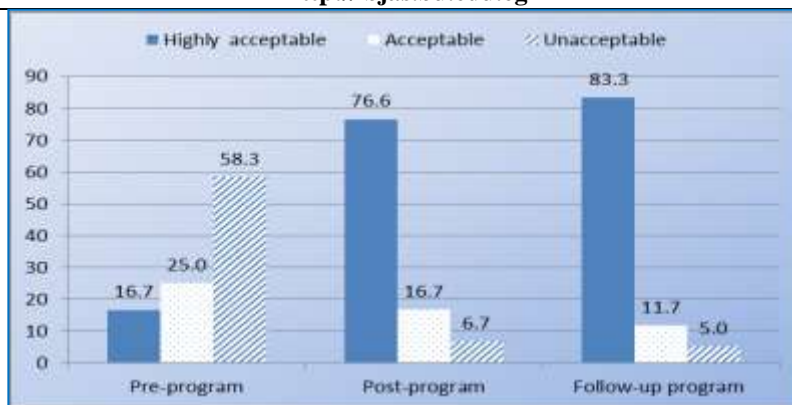


Fig3: Percentage distribution of the Studied intern-nurses' total technological skills for using electronic health record software through the program phases



Fig 4: Percentage distribution of the Studied intern-nurses' total attitude toward electronic health records software through the program phases

**Table 3:** Correlation matrix between studied variables of intern-nurses (total knowledge, skills and attitude) through the program phases

Studied variables	Intern-nurses									
	Pre-program (N= 60)			Post-program (N= 60)			Follow up (N= 60)			
	Knowledge	Skills	Attitude	Knowledge	Skills	Attitude	Knowledge	Skills	Attitude	
Knowledge	r	1	.805**	.784**	1	.895**	.786**	1	.652**	.618**
	P value	---	.000	.000	----	.000	.000	-----	.000	.000
Technological skills and data entry	r	.805**	1	.749**	.895**	1	.863**	.652**	1	.862**
	P value	.000	-----	.000	.000	----	.000	-----	.000	.000
Attitude	r	.784**	.749**	1	.786**	.863**	1	.618**	.862**	1
	P value	.000	.000	-----	.000	.000	-----	.000	.000	-----

### 5. Discussion

Regarding to the personal characteristics of intern-nurses, the findings of the present study revealed that more than half of intern-nurses had age more than 22 years old with Mean  $\pm$  SD (22.33 $\pm$ .54), the majority of them were female, and more than three quarters of them were single and are living at rural areas.

The result of the present study was consistent with (2) as they found in their study that the majority of the respondents were females. Also (6) as they found in their study that the majority of the respondents were

females with an average age of 22.3 years. Moreover, (14) as they reported in their study that most participants were female and single.

In addition to this result was in agreement with (20) as they reported in their study that the highest percent of participants live in rural area and **Ismail, (2016)** who reported in his study that the highest percent of intern-nurses live at rural areas.

As regarding to **intern-nurses' feeling levels toward AMDs utilization in clinical practice** the findings of the present study illustrated that half of intern-nurses had

positive feeling toward AMDs utilization in clinical practice and one third of them had strongly positive feeling toward AMDs utilization in clinical practice. While fifth of them had negative feeling toward AMDs utilization in clinical practice. This might be due to that mobile technologies have been developed and trialed in nursing education as a way to provide better access to quality educational material that is accessible anywhere and anytime.

This result was in agreement with (12) who reported in his study that most of the study participants had slightly positive feeling and more than one third of them had strongly positive feeling toward AMDs utilization in nursing care.

Concerning intern-nurses' knowledge regarding electronic health records software the findings of the present study indicated that there were a highly significant improvement in knowledge levels regarding electronic health records software after intervention both post and follow up phases after three months of program from the preprogram phase. From the researcher point of view this result may be due to using an AEHR helps "create a technology rich learning environment for students, exposing them to evidence-based practice, standardized nursing language, and informatics competencies and the researcher ability to diversify in communicating content with the use of different educational methods and utilization of such advanced mobile devices as these generations are very passionate about AMDs and any way of modern technology.

This findings is supported by (3) who stated in their study that the benefits to nursing faculty of implementing an AEHR are found in the type of learning that takes place when students interact with this technology and found that students using an AEHR were constructing their own knowledge by learning from clinical cases, learning by analyzing clinical problems, and learning in a collaborative manner.

In the same line (7) reported that Academic EHRs are an important addition to the nursing curriculum. Exposure to this technology throughout professional education allows nursing student to begin acquiring knowledge and skills related to health informatics in order to be an effective member of the healthcare team.

The findings of current study indicated that there was a highly significant improvement in intern-nurses' technological skills for using electronic health records software after intervention both post and

follow up phases after three months of program from the preprogram phase.

From researcher point of view From researcher point of view this improvement may be due to application of EHRs software by using advanced mobile devices for intern-nurses and teaching them how to send an email with attachment, use search engine & accessing the internet, enter her or his email and his password, move between EHRs different sheet, enter complete and accurate data quickly with allowed time, save the entered data and can recall the folders at next time all of this making the students deal more with PDAs and technological issues.

In addition to , this improvement in the performance of the intern-nurses could have resulted from their readiness to learning new skills to facilitate their work and increases their efficacy as after their graduation they may be wok in hospital use such this system at this time they already receive an experience which make them more confident and proficient. While the increase that occurred in skills scores at the follow-up phase could be explained in the light of appearance of corona virus as it has forced a sudden migration to online learning by using either desktop computers or handheld computers and activating blended learning. As the pandemic accelerated, colleges shifted into emergency mode, shutting down campuses in an effort to prevent the spread of COVID-19. All of this makes intern-nurses more skilled.

The foregoing findings were in agreement with (1) who showed in his study that the increase in electronic documentation in skill performance, all students rated the ease of completing the electronic documentation systems as very easy and easy.

this regard, (16) reported in their study that there is an improvement in EMR proficiency and technical skill of nursing intern after implementation of mobile AEMR academic EHR.

The result of present study illustrated that there was a highly significant improvement intern-nurses' attitude toward EHRs software level after intervention for both post and follow up phases after three months of program from the preprogram phase. Additionally more than half of intern-nurses had a negative attitude toward electronic health records software at pre-program implementation phase before intervention.

From the researcher point of view this may be due to intern-nurses during their academic training they already saw paper documentation and how it consume nursing staff time not only this but also patient ticket is



not organized, in some time nurses leave the patient ticket on the counter and thus threatening the patient's privacy and nurses consume a great time in documentation and not have enough time to stay with patient but after implementing the EHRs software program they notice the big difference between it and paper documentation in terms of the organization, saving time and effort as result nurses will have enough time to stay with patient and maintain patient privacy.

Findings of the present displayed that there was a highly Statistically significant positive correlation between intern-nurses' technological skills required for using electronic health record software with their **knowledge** at pre- program, immediate post and follow up program implementation phases Also, there was a highly Statistically significant positive correlation between intern-nurses' attitude toward using electronic health record software with their **knowledge** at pre-program, immediate post and follow up program implementation phases

The result of the present study was in accordance with (4) as they reported in their study that there is positive correlation between intern-nurses attitude toward EHRs with AMDs and their skills and (18) found that there is a positive relationship between perceived ease of use and perceived usefulness and attitude and knowledge.

This result of the present study was in accordance with (9) as they reported in their study that the students were very positive about the EPR app and they were able to use the app successfully in simulation. They engaged well with the EPR simulations and were positive about the value and impact of the activity on their learning how to use EPRs. Also this result of the present study was consistent with (15) as they reported in their study that students considered the AEMR application useful. And mentioned that to improve nursing students' acceptance of EMR for education, increasing perceived usefulness is very important.

#### 6. Conclusion

The present study concluded that implementing academic mobile electronic health records (AMEHRs) software was effective. The highest percentage of intern-nurses had a good knowledge about AMEHRs, highly acceptable level of technological skills for using EHRs software, and positive attitude toward AMEHRs software throughout immediate post and follow up from the preprogram implementation phases. There was highly statistically significant positive correlation between their knowledge regarding

AMEHRs software with their technological skills required for toward using AMEHRs software, with total performance scores and attitude toward AMEHRs software at pre-program, immediate post and follow up program implementation phases.

#### 6. Recommendation:

Based on the findings of the present study, the following recommendations are proposed;

- The hospital administration should take the necessary steps to develop proper ICT infrastructure required for EHRs records utilization with AMDs in clinical practice.
- Academic nurse leaders should establish nursing informatics skills for nursing students and nurses by continuing education, training and classroom teaching with practical classes. Also need to integrate IT based NI into the nursing theory and practical session in order to improve nursing informatics skills and address unwarranted variations and enhance outcome.
- Nursing students had a positive attitude about EHRs software, so in order to make more use of this software in providing qualitative care to the patients, using this software in the areas of teaching, research and clinical practice of students is recommended.

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