Staff nurses' readiness to use computer system in clinical practice at Shebin Elkom Hospitals

Nermin Mohamed Eid

Assistant Prof. of Nursing Administration, Faculty of Nursing, Meofiya University

Abstract:

Background: Nurses are being challenged to the use of computers into their daily work, it is imperative to understand nurses' readiness towards the use of computers in order to ensure a successful implementation. **Aim** is to assess the critical care staff nurses' readiness to use computer system in clinical practice at Shebin Elkom University Hospital and Shebin Elkom Teaching Hospital. **Sample was** consisting of all staff nurses working in the critical care units at Shebin Elkom University Hospital and Shebin Elkom Teaching Hospital during the study time (152 nurses). **Tool:** Questioner sheet was used for data collection (49 items). **The results** indicated that all of the studied nurses in Shebin Elkom Teaching Hospital were agreed with that computer is very important in nursing practice, and the majority of them were agreed with that computers system help to improve nurse performance at work. Total staff nurses have a moderate skills level of using computer and Shebin Elkom University Hospital staff nurses had more knowledge about computer using than Teaching Hospital, most of the staff nurses are aware by the benefits of using computer. The highly cost to provide a large numbers of computers, and no enough spaces in the patients' room are barriers of apply using computer. Nearly all of studied subject were agreed with providing computer programs according to nurses' educational level to overcome these barriers. **The study concluded** that, highest percent of staff nurses were having readiness to use computer system in nursing practice. **The study recommended;** nurses need for organizational support includes organizing education and giving training programs for the staff nurses to overcome some of their fears about using computer. Generating supportive written instructions for how to use the computer system before the implementation of the new application.

Key words: Staff nurses readiness; computer system; information system

Introduction:

Nurses all over the world are expected to keep pace with information communication and technology developments in order to help them make informed decisions regarding patient care and management. Because a user's attitude toward the whole phenomenon of information communication and technology affects his/her willingness and readiness to use computers and hence an organization's ability to move toward a paperless system. It's important to establish the existing attitude of nurse in order to determine how computerization will be achieved. [1]

Widespread use of technology by nurses began following the development of monitors, ventilators and other machines for use in intensive care units by critical care nurses. The use of technology in healthcare has progressed to the point where machines, such as ventilators are frequently used by nurses. It has been proposed that modern nursing is deeply connected to technology development. [2]

The push toward implementation of electronic health records has raised issues related to the acceptance of the technology. This is particularly important in intensive care units (ICUs) where nurses experience high workload. [3] Integration of computer technology in health care requires an objective and comparative information on how nurses view the use of computers and the factors affecting these attitudes. Nurses have difficulty

in understanding the advantages of an electronic medical record system due to feeling threatened by the computer and feelings of loss of control. [4]

Another factor that affects the nurses' attitude for the electronic medical records is their inability to comprehend as to how the electronic medical records works and their lack of knowledge regarding the many benefits that it has to offer. It is true that the concept of electronic medical records is new to almost everybody who is involved in the care of the patient.[5]As acute care facilities transition to some type of an electronic patient records system, it is necessary to identify user's computer knowledge, experience, attitudes and images towards electronic patient records prior to implementation.[6]

Nurses should be equipped to view the introduction of and developments with regard to information technologies as a challenge. Any fears and misgivings should be overcome. For example, a fear of being replaced by computers ought to be addressed and the suspicion that information technology use has negative effects on patients' care. This also applies to any misgivings about the effect of information technologies on caring relationships in the healthcare setting. Also communication is important competence, is a means of sending or receiving information. Nurses must also be able to operate e-mail, chatting and bulletin board applications appropriately to ensure effective communication. They must also be able to apply the etiquette for e-mail communication, chatting and video conferencing. [7]

Successful implementation of electronic patient records requires listening to users' perception of the impact that a system change would have on core work values, recognizing the barriers to adoption of the technology, and creating an action plan for working through likely user resistance. Knowing user difficulties and barriers to use technology could help prevent or minimize the discomforts created during the transition stage. [8] Accessing data stored in the electronic health record allows clinicians to surmise patient trends. Using electronic health records for prescribing does not disrupt clinical workflow, and enhances safety and quality of care for the patient. [9]

Significance of the study:

Today nurses are being challenged to incorporate the use of computers system into their daily routine of providing patient care.(10)Even though nurses have used computers for many years to place orders and lookup test results, they are reluctant to give up the traditional means of charting and adopting electronic documentation. Since nurses represent the largest group of computer users in healthcare, it is imperative to understand nurses' readiness towards the use of computers system in order to ensure a successful implementation of a documentation system.

Theoretical framework:

The Theory of Planned Behavior (TPB) posits that the main determinants of individual behavior are attitude toward behavior, subjective norm and perceived behavioral control. According the theory attitude toward behavior is an individual's positive or negative feelings about performance. Subjective norm describes an individual's consideration that most people who are important to him think he should or should not perform the behavior in question. Perceived behavioral control is defined as perceived ease or difficulty of performing the behavior. Theory of Planned Behavior holds that attitudes,

subjective norms and perceived behavioral control are direct determinants which in turn influence behavior.(11)

Aim of the study:

The study aimed to assess the critical care staff nurses' readiness to use computer system in clinical practice at Shebin Elkom University Hospital and Shebin Elkom Teaching Hospital.

Research questions:

1. Are the staff nurses knowledgeable about computer system?
2. Are the staff nurses aware by the benefits of computer system?
3. Are the staff nurses aware by barriers of applying computer in clinical practice and methods of overcoming it?
4. Are the staff nurses ready to use computer system in nursing practice?

Subjects and Method:
Research Design:

Descriptive comparative research design was utilized in this study.

The Study Settings:

The study was conducted in the critical care units (intensive care unit, premature infants unit, and kidney dialysis unit) at two hospitals namely Shebin University Hospital and Shebin Elkom Teaching Hospital. The bed capacity in University hospital was 700 beds otherwise Teaching hospital was 610 beds.
Subjects:

The study sample was recruited from the above mentioned two hospitals. It consisted of all available staff nurses working in critical care units at the time of study. Their total number was (171) staff nurses, (95) from Shebin University Hospital, and

76 from Shebin Elkom Teaching Hospital. Total number of staff nurses who accept to share in the study from Shebin University Hospital was (86), while the total number of staff nurses who accept to shear in the study from Shebin Elkom Teaching Hospital was (66).

Tool of data collection:

A questionnaire sheet: For assessing the critical care staff nurses readiness toward using computer system in nursing practice. It was consisting two parts:-

- **Part one:** Which related to demographic characteristics of the staff nurses (qualification, age, gender, unit of work, years of experience, previous experience of computer, and previous use of computer in the work field).
- **Part two:** A structured computer readiness questionnaire was developed by the researcher based on reviewing of literature. [12] It aimed to assess staff nurses readiness toward using computer in nursing practice. It included (49) questions as following:

Categories	No. of questions
Knowledge about computer system.	4
Computer skills.	6
Concept of computer	19
Benefits of computer.	6
Effects of computer on the quality of care	4
Barriers of computer applying	5
Methods of overcoming barriers of applying computer.	5

Scoring system:

In relation to the questions about the nurses' knowledge and skills the scoring system ranged from one for answer (no), two for answer (to some extent) and three to answer (yes).

While in relation to the remaining questions the original source was used five- point likert scale ranged from strongly disagree (1 score) to strongly agree (5 scores) and collapsed in this study to three- point likert scale which used to assess respondents' readiness to use computer in nursing practice. The response chooses was ranged from one for (disagree), two for (undecided) and three for (agree).The total mean score was determined as following:

High level of readiness	**115 →147**
Moderate level of readiness	82 → 115
Lower level of readiness	49 → 82

Reliability of tool:
Reliability of the tool indicated accuracy with respect stability and reliability in gathering data. The reliability of the tool was assisted through test and retest.
It was measured by administering a test twice at two different points in time. This result indicated that there was no change needed to be constructed in the tool.

Field work:
- Reviewing the national and international related literature using journals, magazines, periodicals, textbooks, internet and theoretical knowledge of the various aspects concerning the topic of the study.
- Translating all questionnaire sheets into Arabic format. Also the *face validity* of the tool was tested by panel of experts who recommended modification related to items clarity, arrangement, and conversion of some items to be answered by (yes, no and to some extent), and the necessary modifications were performed.
- Data collection took about one month; from September to October

2013. The data collected from staff nurses working in critical care units in two hospitals during the morning and afternoon shifts. The researcher handed the questionnaire sheet to the participant nurses in their working units, then explained to them the purpose of the study and asked them fill it.

Pilot Study:
Pilot study was conducted to assess tool clarity and applicability, it also served in estimating the time needed for filling the questionnaire sheet was about (20 – 25 minutes). It was done on 10 of nurses included in the study sample. The result of the pilot study led to no modification in the statement format.

Administrative and ethical considerations:
Before any attempt to collect data, an official approval to conduct the study was obtained from medical and nursing directors of Shebin University Hospital and Shebin Elkom Teaching Hospital. This was done by issuing letters from the Faculty of Nursing clarifying the aim of the study to the two hospitals' directors. Each participant was notified about the purpose of the study and about the right to accept or refuse to participate. Complete confidentiality of the obtained information was assured.

The study subject was informed about the purpose and benefits of the study, and they were informed that their participation is voluntary and they have the right to refuse to participate in the study without giving any reason. In addition, confidentiality and anonymity of the subjects were assured through coding of all data.

Statistical Design:
Data were verified prior to computerized entry. (SPSS version 11.0) was used for that purpose, followed by data analysis and tabulation. Descriptive statistics were

applied (e.g., frequency, percentages, mean, and standard deviation,). Test of significance as chi square, was used for investigation of the relationships among variables. A significant level value was considered when p ≤ 0.05, and a highly significant level value was considered when p ≤ 0.001.

Results:

Table (1) shows that the total study sample was 152 nurses, 86 of them working at University Hospital and the other 66 nurses at Shebin Elkom Teaching **Hospital**. As farther, more than two thirds of staff nurses (61.9%) were at age group of < 30 year, while in regarding to their years of experience; more than have of them (55.3%) were < 10 years of experience. In relation to nurse's qualification, about two thirds of staff nurses (61.2 %) has diploma in nursing, while more than half of them (54.7 %) had no previous experience with computer, also the majority of staff nurses in University Hospital and Teaching Hospital (87.2% and 80.3%) respectively did not use computer in nursing practice before.

Table (2): Illustrates level of nurses' readiness regarding using computer in the studied hospitals. The result reveals that more than half of the studied nurses in Shebin Elkom University Hospital (55.8%) show high level of readiness. While about two thirds of the studied nurses in Shebin Elkom Teaching Hospital (60.6%) show moderate level readiness. Also result shows that there is a statistical significant difference (P<0.05) between studied sample.

Table (3): Present mean scores of staff nurses' knowledge and skills toward using computer system in the studied settings. The result shows that there is no statistical difference between the studied samples in relation to items of the study. Also this table shows that the Shebin University

hospital staff nurses are more knowledgeable and skilled about computer system than the Shebin Elkom Teaching Hospital staff nurses.

Table (4) Portrays mean scores of staff nurses' agreement about benefit and effect of computer in the studied settings. The results revealed that, there is a highly significance difference between studied subject in relation to benefits of computer and also a statically difference but not significance in regarding to effects of computer in clinical practice in the study settings. Totally the nurses are aware by the benefits and effects of computer in clinical practice.

Table (5): The result shows the mean scores of staff nurses' agreement about barriers and its overcoming of using computer in the studied settings. The results revealed that, there was a highly significance difference between studied subject in relation to barriers of computer applying in clinical practice and also a statically difference but not significance in regarding to methods of overcoming these barriers. By all the staff nurses were aware by the barriers and methods of overcoming it in clinical practice.

Discussion:

Healthcare industry is in need of fundamental change, and technology is a likely component of the solution. Earlier studies showed that there is a little research into the acceptance and readiness to use of information technology among critical care nurses. It is important to gain an understanding of the users, as well as the social and behavioral issues, before implementing such a technology.[13]

Therefore the need for research in this field is evident. The purpose of this study was to asses the critical care staff nurses readiness toward using computer system in nursing practice. The current study involved one hundred and fifty two staff nurses

working in critical care units at Shebin Elkom University and Shebin Elkom Teaching Hospital, about two thirds of them were working in Shebin Elkom University Hospital, and their age is less than 30 years. The height percentage had a diploma degree in nursing. All of them were females and more than one thirds of them had less than ten years of experience in nursing. More than two thirds of them have no previous using of computer, and more than one thirds of them having no previous computer experience.

The results of this study showed that the staff nurses have knowledge about the computers. This refers to the nurses' readiness to use computer not correlated to their knowledge about computer. These findings are in accordance with the study by Liu et al., [14] who revealed that nurses' computer knowledge was not correlated to their attitude and readiness to use computer. While contradicted to the results conducted by Emans et al., [15] who show that even though nurses are having good computer knowledge the staff nurses had a moderate level of computer skills which was consistent with the results of several studies whose showed that nurses' basic computer skills were not on a very high level and it more important for nurses to be proficient in using the Internet and various databases.[14,16-18]

Moreover, the results indicated that all of the studied nurses in Shebin Elkom Teaching Hospital were agreed with the computer is very important in nursing practice, and the majority of them in Shebin Elkom university hospital were agreed with the computers help to improve nurse performance at work. Which refers to the staff nurses have a positive concept and attitude toward computer. These results are consistent with those of others studies that suggested nurses in general have a positive attitude and concept toward use of computerized systems. [19-22]

However, the results contradicted studies such as Estabrooks et al., [16] that showed nurses have negative or neutral attitudes toward using computers.

Furthermore, the results showed that the most of studied nurses were agreed with using of information technology reduces error, and items of using computer secure the patient information from being lost. That may be because computer provide practical guidance in the clinical setting and assist nurses in the decision making process required in patient care, the staff nurses is aware by the benefits of computer and it is important to nurses to accept computer using in clinical settings.

This results in accordance with Klopping and Mckinney,[23] who stated that the nurse' awareness about computer benefits have a great impact on nursing staff's acceptance of the technology . Also, Legris et al., [24] stated that awareness of computer benefits perceived have been considered important to understand the individual's acceptance and use of technology. Moreover, a new technology has proven better to use when it has entailed immediate benefits for users. [25, 26]

In this respect, the users do not see the use of the technology as useful unless they see clear benefits for their work practices.[27,28] The user group participants suggested that raising awareness among staff nurses about the benefits of computer including quality of care and financial outcomes would serve as an important facilitator. [29-31]

Also the result shows that the majority of the studied nurses in Shebin Elkom University Hospital were agreed with computer will

improve documentation of the clinical records, and about two thirds of the studied nurses in Shebin Elkom Teaching Hospital were agreed with computerized charting decrease nurses workload. That is may be because the capacity of computer can take more and more documentation without paper use and the time spent for computerized charting is much less than that spent in handwritten.

This finding was the same as that of Poissant et al.,[31] who demonstrated that the computer is a valuable tool to serve as a partial substitute for nurses, and that will reduce time spent by nurses in patient care. Also, this finding in consistent with study of Kossman and Scheidenhelin [32] who stated that more time is available due to automation and that efficiency of the nurses increased.

In relation to the nurses' agreement regarding barriers of computer applying; The result indicates that the most of the studied subject were agreed with items of, no enough computers as a barrier to computer applying. This may be due to the highly cost to provide a large numbers of computers, or due to no enough spaces in the nursing stations. This was consistent with the study by Polit and Beck [33] who showed that the most frequently mentioned barriers to use of computers were these: not enough space in patients' rooms to use the computer system; having to record on paper first then transfer the data to the electronic health record system; too many interruptions. Cost was also one of the most frequently mentioned barriers for the computer entering. [34, 35]

The result of the present study identified that, nearly all of studied subject were agreed with providing computer programs according to nurse educational levels as a computer

applying barriers overcome. This may be due to the nurses want and ready to use computer but they in need to more training and preparation. This finding goes with Lorenzi et al.,[36]who reported that clinical staff are now more willing to adopt new technologies when they can dealing with it, applications are user- friendly and fit within their daily workflows.

The findings of the present study revealed that the critical care staff nurses are ready to use computer system in their work. This may be because the units in which they working is a highly critical filed and the work in these units need the nurse to be highly qualified, highly skilled and to be update with the technology which introduced to this units. Also this may be because the staff nurses are aware by the care which they provided in need to be improved. These findings are parallel with findings from many studies measured staff nurses readiness to use computer. [37,38] who determined that a majority of hospital personnel possessed positive attitudes and portrayed a willingness and desire to learn about technological applications.

Additionally, the finding of this study is consistent with those of other studies, mainly conducted on nurses. [21,39,40] which shows that the most satisfying aspect of the study was the revelation that the care providers were quite and willing to adopt and applying the electronic health record, in order to improve the quality of care they provided to their patients.

Also, this result is in contrast with the result of study done by Austen et al., [41] which estimated that (45%) of technologically based medical information systems fail because of user attitudes, resistance and anxiety regarding information technology and suspicion that information technology use has negative effect on patients` care.

This result also, contradicted with the result done by Lubowski et al., [40] who concluded that nursing professionals may have negative perceptions of technology and their interest of computers may be slight and acceptance of hospital information systems was also somewhat dependent on the specialty and department of employment.

Whereas acceptance of staff nurses to use computer, is believed to be a key factor influence successful implementation of computer in the work filed. The present study therefore proposed nurses motivation and perception of work environment as a factor influencing the development of critical care staff nurses readiness toward using computer in nursing practice.

Conclusion:
- The study concluded that staff nurses in the study hospital are knowledgeable about computer and had a moderate level of computer skills. They have a positive concept and attitude toward using of computer system.
- The result revealed also that the staff nurses are aware by the benefits of computer system and agreed that the computer have a positive effect on quality of patient care
- Regarding barriers of applying computer, most of staff nurses agreed with highly cost to provide a large numbers of computers, and no enough spaces in the patients room as a common barriers.
- As regarding to methods of overcoming barriers of using computers, the result revealed that nearly all of studied subject were agreed with providing computer programs according to nurse educational levels. Also, the result of the present study was concluded

that, highest percent of staff nurses were having readiness to use computer system in nursing practice.

Recommendations for nurses' level:
1. Involve nurses at all stages, including planning, designing, or implementing of information technology in the work filed.
2. Encourage all nurses to use computers, correct nurses' misconceptions and resolve actual problems following computer using.
3. Increase the nurses' basic knowledge about computer system and their understanding about computer applications and its impacts on the nursing profession.

Recommendations for hospital administration:
1. Adequate financial resources for equipments, connections, and rooms.
2. Organizational support includes organizing education program and giving opportunities for practical training sessions about using of computer in nursing practice for nurses
3. Generating supportive written instructions for how to use the computer system before the implementation of the new application.
4. Ensuring that the computer system matches with the needs of nurses in relation to their work.
5. Hospital policy should ask the newly employed nurses about the certification of computer training and using.

Recommendations for educational level:
1. Conduct training programs for the staff nurses to overcome some of their fears about computer, and

teaching staff about developing electronic courses.

2. Conduct training sessions for staff nurses to handle the computer system problems.

3. Conduct training programs for teaching the staff nurses about using computer in their work filed.

4. Develop a manual about computer system being available for all staff nurses at the hospital.

Opportunities for further research:

1. Conduct longitudinal studies to analyze the development, implementation, and evaluation, and state plans for the use of technological innovations in clinical practice environments.

2. Studies should be conducted regarding nurses attitudes toward technological innovations over extended periods of time.

Table (1): Distribution of the Studied Nurses According to their Personal Characteristics (no= 152)

Personal characteristics	Shebin University Hospital no= 86		Shebin Elkom Teaching Hospital no= 66		Total no=152	
	No.	%	No.	%	No.	%
Age (years):						
▪ < 30	60	69.8	34	51.5	94	61.9
▪ 30 – 40	23	26.7	22	33.3	45	29.7
▪ > 40	3	3.5	10	15.2	13	8.5
Mean ± SD	27.87 ± 5.92		32.08 ± 7.29			
Experience years :						
▪ <10	56	65.1	28	42.4	84	55.3
▪ 10 -	26	30.2	26	39.4	52	34.3
▪ > 20 -	4	4.7	12	18.2	16	10.5
Mean ± SD	8.65 ± 6.04		13.35 ± 7.15			
Qualification:						
▪ Baccalaureate degree in nursing	34	39.6	11	16.6	45	29.6
▪ Associated degree of nursing	10	11.6	4	6.1	14	9.3
▪ Nursing diploma	42	48.8	51	77.3	93	61.2
Experience of computer in						
▪ School	32	37.3	15	22.7	47	30.9
▪ Training course	13	15.1	5	7.6	18	11.9
▪ workshops	2	2.3	2	3.0	4	2.7
▪ No experience at all	39	45.3	44	66.7	83	54.7
Using of computer in nursing practice :						
▪ Yes	11	12.8	13	19.7	24	15.8
▪ No	75	87.2	53	80.3	128	84.3

Table (2): Level of Nurses Readiness Regarding Using of Computer in the Studied Settings (no= 152)

Items	Benha University Hospital no=86 Mean ± SD	Benha Teaching Hospital no=66 Mean ± SD	t	P - value
▪ Knowledge about computer system	6.78± 2.44	6.11 ± 2.35	1.711	>0.05
▪ Computer skills	8.96 ± 3.48	8.21 ± 3.17	1.375	>0.05

Table (3): Mean Scores of Staff Nurses' knowledge and skills about Computer in the Studied Settings (no= 152)

Hospitals Level of readiness	University Hospital, no.=86 No.	%	Teaching Hospital no=66 No.	%	X^2	P- value
▪ High	48	55.8	26	39.4		
▪ Moderate	38	44.2	40	60.6	4.030	<0.05*
▪ Low	0	0.0	0	0.0		

*A statistical significant difference (P ≤ 0.05)
**A highly statistical significant difference (P ≤ 0.001)

Table (4): Mean Scores of Staff Nurses' Agreement about Benefit and Effect of Computer in the Studied Settings (no= 152)

Items	Benha University Hospital no=86 Mean ± SD	Benha Teaching Hospital no=66 Mean ± SD	t	P - value
▪ Benefits of computer	17.00 ± 1.59	16.06 ± 2.55	2.784	<0.001**
▪ Effect of computer on quality of care	10.66 ± 1.37	10.09 ± 1.65	2.333	<0.05*

*A statistical significant difference (P ≤ 0.05)
**A highly statistical significant difference (P ≤ 0.001)

Table (5): Mean Scores of Staff Nurses' Agreement about Barriers and its Overcoming of using Computer in the Studied Settings (no= 152)

Items	Benha University Hospital no=86	Benha Teaching Hospital no=66	t	P - value
	Mean ± SD	Mean ± SD		
▪ **Barriers of computer applying**	10.22 ± 2.49	8.67 ± 2.46	3.832	<0.001**
▪ **Methods of overcoming barriers of applying computer**	14.34 ± 1.27	14.77 ±0.60	2.499	<0.05*

*A statistical significant difference (P ≤ 0.05)
**A highly statistical significant difference (P ≤ 0.001)

References:

1. Kivuti L. & Chepchirchir A.: Computerization readiness. *Online Journal of Nursing Informatics (OJNI)*. 2011; February: 15(1): 178 Available at: http://ojni.org/issues/?

2. Afessa B. : Tele-intensive care unit: the horse out of the barn. *Critical Care Medicine*. 2010; Jan: 38(1):292-300

3. Embriaco N., Papazian L., Kentish-Barnes N., et al.,: Burnout syndrome among critical care healthcare workers. 2007; *Curr Opin Crit Care*:13: 482e8

4. Shoham, S. & Gonen A.: Intentions of hospital nurses to work with computers: based on the theory of planned behavior. 2008; *Computers, Informatics, Nursing*: 26 (2): 106-116

5. Amin M.: Assessment the quality of nursing care records in intensive care unit of Cairo University Hospitals. 2003; MSc. Thesis submitted to Cairo University. P: 20

6. Dillon TW., McDowell D., Saimian F., et al. : Perceived ease of use and usefulness of bedside computer systems. 2005; *Computers in Nursing*: 16(3): 151- 156

7. Irani JS, Middleton JL, Marfatia R, etal. The use of electronic health records in the exam room and patient satisfaction: a systematic review. 2009; *J Am Board Fam Med*. : 22(5):553-562

8. Lee, T. Nurses' experiences using a nursing information system. 2007; *CIN: Computers Informatics Nursing: 25:* 294-300

9. Tripp J S. , Narus S P., Magill M K., et al.,: Evaluating the accuracy of existing EMR data as predictors of follow-up providers. 2008; *The Journal of the American Medical Informatics Association:* 15(6): 787-790

10. Lee T. Nurses' adoption of technology: application of Rogers' innovation-diffusion model. 2004*; Applied Nursing Research: 17*(4): 231-238.

11. Ajzen I and Fishbein M. Understanding attitudes and predicting social behavior. Englewood Cliffs. 1980; *NJ, Prentice Hall*:12(11):53-6

12. Firby P A., Luker K A. ,and Caress A L. :Nurses' opinions of the introduction of computer-assisted learning for use in patient education. 1991; *Journal of advanced nursing*: August 16(8) : 987-99

13. Lorenzi NM. and Riley RT. *: Managing Technological Change: Organizational Aspects of Health Informatics*. New York: Springer-Verlag; 15(8): 548-65; 2008

14. Liu JE., Pothiban L., & Khamphosiri T.: Computer knowledge, attitudes and skills of nurses in people's hospital of Beijing Medical University. 2000; *Comput Nurs.*: 18(4): 197-206

15. Raja E E., Mahal R. & Masih V B.: An exploratory study to assess the computer knowledge, attitudes and skills among nurses in health care

setting of a selected hospital. 2004; Ludhiana, Punjab. Available at: http//: ojni.org/issues. Date of access: 30-11 2013

16. Estabrooks CA., O'Leary KA., Ricker, KL. et al.,: The Internet and access to evidence: how nurses positioned? 2003; *Journal of Advanced Nursing*: 42 (1): 73-81

17. Garg A. & nad Turtle KM.: Effectiveness of training health professionals in literature search skills using electronic health databases – a critical appraisal. 2003 ;*Health Information and Libraries Journal*: 20 (1): 33-41

18. Gagnon MP., Légaré F. , Labrecque M. , et al.: Interventions for promoting information and communication technologies adoption in healthcare professionals. 2006 ;*(Protocol) Cochrane Database of Systematic Reviews:* Issue 3. Art. No.: CD006093. DOI: 10.1002/14651858.CD006093

19. Brumini G., Kovic I., Zombori D. et al.,: Nurses' attitudes toward computers: Cross sectional questionnaire study. 2005; *Croatia Medical Journal:* 46(1): 101-104

20. Abdrbo A., Hudak CA., Anthony M K., et al.,: Moderating and mediating roles of nurses' beliefs: Information systems use among Ohio nurses. 2006; *American Medical Informatics Association*: 13, 668-675

21. Alquraini H., Alhashem AM., Shah MA., et al.,: Factor influencing nurses` attitude towards the use of computerized health information system in Kuwaiti hospitals. 2006; *Journal of advanced Nursing*: 57 (4): 375- 381

22. Eley R. , Soar J. , Buikstra E. et al. Attitudes of Australian nurses to information technology in the workplace: A national survey. 2009; *Computers Informatics, Nursing:* 27 (2): 114-121

23. Klopping I M. & McKinney E I. : Extending the technology acceptance model and the task-technology fit model to consumer e-commerce. 2004; *Information Technology, Learning, and Performance Journal*: *22*(1): 35-48

24. Legris P., Ingham J. & Collerette P. Why do people use information?: A critical review of technology acceptance model. 2003; *Information & Management*: 40: 191-204.

25. Chismar W. & Wiley-Patton S. : Does the extended technology acceptance model apply to physicians? 2002; *Proceedings of the 36th Hawaii International Conference on System Sciences: 6: 160-167.*

26. Laerum H., Lium J-T. , Schulz T. et al.,: From the front line, report from a near paperless hospital: Mixed reception among health care professionals. 2006; *Journal of the American Medical Informatics Association:* 13 (6): 668-786

27. Yarbrough AK. & Smith TB.: Technology acceptance among physicians. 2007; A new take on TAM. *Medical Care Research and Review*:64 (6): 650-672

28. Hyppönen H. & Niska A.: Towards a good development practice for citizens' Health services. 2008; National Research and Development Centre for Welfare and Health, STAKES, Reports: 9/2008, Helsinki

29. Ash JS., Stavri PZ., & Kuperman G J.: A consensus statement on considerations for a successful CPOE implementation. 2003; *J Am Med Inform Assoc*: 10 (3): 229-234

30. Smith P D.: Implementing an EMR system: One clinic's experience. 2003; *Family Practice Management*: 10(5): 37-42

31. Poissant L., Pereira J., Tamblyn R. et al.,: The impact of electronic health records on time efficiency of physicians and nurses: a systematic review. 2005; Journal of the American Medical Informatics Association : 12 (5): 505-516

32. Kossman SP. & Scheidenhelm SL.: Nurses' perceptions of the impact of electronic health records on work and patient outcomes. 2008; Computer Inform Nurse: 26:69e77

33. Polit DF. &Beck CT. Nursing research: Principles and methods.7th

ed. Philadelphia: Lippincott Williams & Wilkins; 2004: 802-10

34. Anderson G K.: Preventive medicine and the electronic health record. 2004; *Medscape Public Health & Prevention*: 2(2)

35. Hillestad R., Bigelow J., Bower A. et al.,: Can electronic medical record systems transform health care? Potential health benefits, savings, and costs. 2005; *Health Affairs*: *24*(5): 1103-1117

36. Lorenzi NM., & Riley RT.: Managing technological change: Organizational aspects of health Informatics. *New York: Springer-Verlag; 2004: 548-65*

37. Dickinson G., Fischetti L., & Heard S.: HL EHR System Functional Model: Draft Standard for Trial Use, July 2004. [Internet] Available: www.hl7.org/ ehr/downloads/index_ 2004.asp. Accessed on: 2nd, April, 2007

38. Poon E G., Blurnenthal D., Jaggi T. et al.,: Overcoming barriers to adopting and implementing computerized physician order entry systems in U.S. hospitals [Electronic version]. 2004; Health *Aflairs*: 23(4), 1 84- 1 85.n practice. Indianapolis: Sigma Theta Tau International.

39. Karmer JS., Hopkins PJ., Rosendle JC, et al.,: Implementation of an electric system for medication reconciliation. 2007; *Am J health Syst. Pharm.*: 64(4): 404-22

40. Lubowski TJ., Cronin LM, Pavelka RW, et al.,: Study of basic computer competence among public health nurses in Taiwan. 2004; *Journal of Nursing Research*: 12 (1): 1-9.

41. Austen S. & McGrath M.: Attitudes to the use of videoconferencing in general and specialist psychiatric services. 2006; *Journal of Telemedicine and Telecare*: 12: 146-150

/

-(   )   :
)

                                                -(
              .(   )
                    :

          :

                    ■   .

                    ■

                    ■   .
                                        :
                                        :

              .

          :   :   .

                                        :

              .

          :
  :
                                        .

          :

                    ■   :

              .

                    ■   :   ■
                    ■   –   –   )
                                              :
              .   -
                                        -      -
                                          .(
          :   :   ■
                    ■   :
              .   -(   )
                                  -(   )
                          -(   )
          .   -(   )

■ .

■

■

■

■

■

:

■

■

.

:

■

.

■ عمل دراسات لتقييم اتجاه الممرضـات نحـو التكنولوجيا الحديثة على فترات متباعدة.