Nurses' Knowledge, Attitude and Practices of Nursing Informatics System in Outpatient Clinics of Children's Cancer Hospital (57357) at Cairo

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Abstract
Technology in health care is increasingly becoming an integral part of the Egypt. Health care delivery system and is declared by strategists as a means whereby sustained improvement in health-care outcomes may be attained. This study was carried out aiming to assess nurses` Knowledge, attitude and practice about the nursing informatics system at out -patient clinics of Children's Cancer Hospital (57357), at Cairo. A descriptive research design will be utilized in this study was carried out in this hospital during April 2013. Sample consists of nineteen male and female nurses who are working in out-patient clinics. This study was conducted at the different out-patient clinics at Children Cancer Hospital (57357) at Cairo. Two tools were utilized to collect data pertinent to the study; one of them is a socio demographic data sheet and the second tool is a structured interview questioner schedule developed by investigator. Findings of this study showed that the majority of the sample was females and more than half of them were single. In addition to, it was found that, more than half of them academic faculties. Also, there was highly statistical significant difference between total knowledge of nursing informatics system according to total practice and total attitude of nursing informatics system. This study concluded that nurses are responsible for a substantial part of the patient record and hence are particularly affected by the computerization. The appliance of information system into nursing provides important advantages of the nursing personnel's data and contributing to the improvement of the operating effectiveness of the nursing service. Recommendation: In Egypt (2013), nursing informatics is a new specialty and therefore should cover major sectors of the healthcare system where nurses work; this includes the clinical, administrative, research and education areas.
Keywords: Knowledge, Attitude and practices nursing informatics, Nursing Informatics System, Hospital Information System.

1. Introduction
Technology in health care is increasingly becoming an integral part of the Egypt. Health care delivery system and is declared by strategists as a means whereby sustained improvement in health-care outcomes may be attained. Nurses role in client care delivery have a pivotal role in this technology deployment, maintenance and evolution, although nurses are involved in technology in health-care the specific roles are diverse and nursing informatics system has become one's of those key roles (Mari, 2014).

Nursing informatics system involved in implementation of new technology in health care and they realize the goals for every new health care technology implementation are to enhance service, streamline a process, and reduce cost. As nurses' works in nursing informatics system in out -patient clinics is vital signs, heart rate, respirations, temperature and blood pressure for a single client can be considered a set of data. A series of vital signs taken over time, placed into a context, and compared is considered information. However, a dropping blood pressure, increasing heart rate, respiratory rate, and fever in an elderly, the recognition that this client may be septic and in need of nursing and medical interventions reflects information synthesis (American Medical Informatics Association, 2014).

In Egypt hospitals there have been made many trials and efforts to develop nursing informatics system with little results. There are many difficulties and some of them are different levels of nursing education, low nurse to patient ratios, not involvement of nurses in the phases of their implementation and resistance in change. Today's nursing practice in Egypt needs to follow others counties paradigm and phase its controversies and problems to follow the worldwide changes in delivering nursing care and positive attitude toward computers is as essential as it would enhance use of nursing informatics system among nurses, not only in their own practice but also in supporting their clients in making better use of nursing informatics system (Malliarou, 2012).

2.   Material and Methods

2.1. Aim of the Study

The aim of this study is to assess nurses` Knowledge, attitude and practice about the nursing informatics system at out -patient clinics of Children's Cancer Hospital (57357).

2.2. Research Question

What are nurses' knowledge- attitude and practice of the nursing informatics system at out -patient clinics of Children's Cancer Hospital (57357)?

2.3. Research Design

A descriptive research design will be utilized in this study. This design is concerned with description of phenomena of interest and focuses on a single group or population characteristics, attributes, and/or experiences (Schmidt & Brown, 2012).

2.4. Subjects

A Convenient sample of all nurses working at nursing informatics system at out -patient clinics of Children's Cancer Hospital (57357) were interviewed for were the study sample for three months .The total number of nurses (100) nurses from them were working at out-patient clinics. Through the three shifts (morning and night shifts) for three months who were willing to participate in the study, All nurses at out -patient clinics use nursing informatics system after they takes (15) days of training.

2.5. Setting

The study was implemented at out -patient clinics of Children's Cancer Hospital (57357).The main (ground) floor contains general out-patient clinics which consist of (3) rooms for nurses to make complete assessment for clients, (3) rooms (Triage and Emergency rooms). Although the first floor consist of out –patient clinics specialist as (neuclar medicine and cardiology) and also procedure room. The third floor contains polyclinics (multi-specialty department) as (gynecology, ophthalmology, pain clinic, etc…).

2.6. Tools

To achieve the purpose of the study, data will be collected using two tools developed by investigator.

2.6.1.   Socio-demographic data sheet:

It consists of two main sections:

a) Socio-demographic data: It includes data related to : code No, gender, age, marital status, level of education, department of working and years of experience in and out hospital, ect…….....

b) Questions related to assessment of nurses' knowledge related to information technology: It cover data regarding basic knowledge of computer skills, benefits from information technology, idea about nursing informatics, English language before and after using computers, ect….......

2.6.2.   Employee/Staff pre –go-live Expectations/Perception Clinical Information system (2004):

This is a structured interview questioner schedule developed questionnaire was consists of (58) items. It was developed by the researcher based on using the related literature review like; Douglas.Weakfield (2004) based on the comments and reviewing the panel of experts at Faculty of Nursing – Cairo University.

a) **Nurses' Knowledge assessment:**

It cover data regarding to assess knowledge related to nursing informatics system in this hospital, appropriateness of patient care orders and communications at end of shift handoffs etc…….,it consist of (31) items.

The scoring system classified as following:

- Unsatisfactory level of knowledge: less than 60%
- Satisfactory level of knowledge: Between 60% and 74%
- Good knowledge: more than 75%.

b) **Nurses' practices assessment:**

Include items related to the nurse's practices toward information technology such as laptop, touch screen and power cord, the barriers to nurses being to enter client data into EMR (electronic medical record) etc…….., the total scores of this sheet are 100%.

The scoring system classified as following:

- Unsatisfactory level of Practice: less than 75%
- Satisfactory level of Practice: Between 75% and 90%
- Good Practice: more than 90%.

c) **Attitude assessment:**

Include items of the nurse's attitude toward nursing informatics system such   as   use of electronic medical records, the use of the system reduce errors, the system of nursing informatics improve documentation of the clinical record, nursing informatics system has decreased the workload of nurses and other personal etc……., scores on three- items attitude scale were summed to yield a total attitude toward the use of nursing

informatics system.
   The scoring system classified as following:
- Unsatisfactory level of Attitude: less than 37%
- Satisfactory level of Attitude: Between 37% and 72%
- Good Attitude: more than 75%.

3.   Pilot study

A pilot study was carried out for 10 nurses over a period of one month (April 2013) to assess the feasibility of the study as well as clarity, time and objectivity of the tools. Based on the pilot study analysis minor modifications were made in the questionnaire such as; change in question`s wording, omit some questions that had repeated meaning and moving some questions from dimension to another one. The pilot study sample was excluded from the total of the study sample.

4.   Content validity:

Two tools were developed by the investigator reviewed by a panel of three experts' professions in community health nursing specialty. Based on the experts' opinions responses, the investigator developed the final validated form of the tools.

5.   Protection of human rights

An official permission to conduct the proposed study was obtained from the ethical committee of faculty of nursing Cairo University. Also an official permission was obtained from hospital administrators to contact the study nurses were informed about the purpose and nature of the study. Participation in the study was voluntary and based on nurses' ability to give informed consent; where informed consent should be signed by the participants after reading all its details; the ethical issues considerations include explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not accessed by any other party without taking the permission of the participants, participation is with no risk.

6.   Procedure

6.1. Preparation phase

   It was concerned with constructing and testing different data collection tools, in beside the managerial arrangements to carry out the study as well as to conduct the pilot study. Nurses who agreed to participate in the study interviewed individually by the investigator to explain the nature and purpose of the study and a written consent was obtained.

6.2. Implementation phase

   Data were collected with a duration of (3) months from April 2013 to June 2013. The investigator visited the selected out-patient clinics daily during their working all shifts (morning, afternoon and night). The investigator invited nurses in each department according to each department that was available in this day to participate in the study and a written consent obtained, and also no compensation was given to the respondents as research was conducted during their normal working hours. Each nurse was interviewed for 15 – 30 minutes to fill out the knowledge, Practice and Attitude questionnaire schedule about nursing informatics system.

7.   Results

7.1. Table 1: showed that the majority of the studied sample were females and while specialized nurse, where their ages ranged between 20-<30 years; (81.1%), (92.2%) and (84.4%) respectively. As well more than half of them living in urban area (60%) they were graduated of faculty of nursing (66.7%). Less than half of them (40%) are having < 5 years of working experiences outside and inside hospital. (37.5%) of nurses were working in ground floor out-patient clinics and they are having 3-5 years of working experiences inside hospital (35.6%).

7.2. Table 2: showed that the majority of the studied subjects answered (Improve) knowledge questions .Furthermore, the majority of the studied sample had good knowledge according to patient care through nursing informatics system with percentage (equal 100 %).

7.3. Figure 1: showed that the majority of studied sample (98%) knowledge score level according to nursing informatics system was good. While (1%) and (1%) of studied sample had satisfactory and unsatisfactory respectively.

7.4. Table 3: showed that the majority of the studied sample was satisfactory practice of nursing informatics system according to results in this table. The majority of nurses' access to computer on your unit easily and nurses had experienced computer as user. In addition to, nurses enter data into the electronic medical record,

and do you feel confident about what you are doing (96.7%), (77.8%) and (94.4%) respectively.

7.5. Figure 2: showed that more than half of nurses (62%) practices score level according to nursing informatics system was satisfactory. While (34.4%) of nurses were unsatisfactory of practice. furthermore, (3%) of nurses were good of practice.

7.6. Table 4: showed that the majority of nurses answered strongly agree and agree in attitude questions. Furthermore, the majority of nurses had positive attitude according to nursing informatics system improved the ability to give patient rights with percentage (equal 81.1 %).

7.7. Figure 3: showed that the majority of studied sample (77%) attitude score level according to nursing informatics system was good (positive attitude). While (23%) of studied sample was satisfactory.

7.8. Table 5: showed that there was no statistical correlation between total nurse's attitude of nursing informatics system according to total practice of nursing informatics system (r=.125, P=.242). While, there was no statistical correlation between total knowledge of nursing informatics system according to total practice and total attitude of nursing informatics system (r=.319) and (r=.334) respectively. Furthermore, there was highly statistical significant difference between total knowledge of nursing informatics system according to total practice and total attitude of nursing informatics system (P=.003) and (P=.002) respectively.

8. Discussion

Current research can be considered as giving some insight, but an incomplete picture of nursing informatics system implementation in nursing field. Nevertheless, evolution both in nursing informatics system theoretical approaches and evaluation research has opened a new road for a more comprehensive analysis of nursing informatics system implementation (Roger Watson, 2012). The total number of the studied sample was (90) nurses, the three quarters of them were females that might be through the greater fraction of the nurses in Egypt were females and may also related to the studying of nursing in the Egyptian Universities was exclusive for females only till seven years ago; where their ages ranged between 20-<30 years. Thus, half or more of them were single and had Bachelor nursing degree lead to less than half of them are having < 5 years of working experiences inside and outside hospital. In researcher point of view a lot of bachelor nurses prefer to work at private hospitals and travel abroad they have better chances than diploma nurses .Therefore, bedside nurses in governmental hospitals were diploma nurses and when the bachelor nurses work in the governmental hospitals they are working as a head nurses not a bedside nurse. As well, more than half of them living in city and more one third of them working in ground floor at out-patient clinics.

The results showed that the majority of the studied subjects answered (Improve) about knowledge questions. Raja, Mahal and Masih (2014), agreed with study that the majority of the studied sample had good communication knowledge through nursing informatics system. In researcher point of view education department in hospital supported nurses with program training about nursing informatics system and other courses helped in nursing work. On the other side most of nurses were bachelor which mean nursing curriculum contains nursing informatics, English, and computer courses. However, nursing informatics department respect to nurse's responsibilities and accountability any time in work place through nursing informatics system.

Accordance nurses' practice, the majority of the studied sample was satisfactory practice through nursing informatics system. Raja ,Mahal and Masih (2014),agreed with study that the majority of nurses' access to computer on your unit easily, while nurses considered they to be an experienced computer as user. In addition to, they enter data into the electronic medical record, and do you feel confident about what you are doing. In researcher point view the hospital supported nurses' program training about nursing informatics system before they used it. Furthermore, frequency seminar to nurses had problem in implementation.

Although more than half of nurses' practices score level according to nursing informatics system was satisfactory. Other view of nurses' was unsatisfactory of practice due to the system is slow speed. More, the system and backup of the system was breakdown any time. Similar findings were reported in recent study conducted by Lee et al., (2005), handwriting takes more time than a point-and-click procedure, when the system has slow response time or no available computers, it may take longer complete a task.

The current study findings are similar to those of several studies reported that the majority of the studied subjects answered strongly agree in attitude questions (positive attitude). One of third answered agree with improved nurses' ability to give patient rights through nursing informatics system (Mahal and Alhashem et al., 2007 Raja, Masih, Shah, lindia, Donaa and Moody, 2014). In nurses' view point that system positively effect of them knowledge and practices toward children education and system helped of them near of children brain by uses technology in education or other uses.

Finally from point of view, these results showed that even though nurses had good nursing informatics system knowledge and positive attitude they may be motivated to use computers in out-patient clinics. The nursing informatics system practice in out-patient clinics was satisfactory among nurses. These findings were in accordance with the study conducted by Rajia et al.,(2014), revealed that nurses knowledge toward nursing informatics system were good score levels of nurses had positive attitude and of them satisfactory practice. Grigg,

Stephens, Abubakar, Abbas and Browne (2014), also revealed similar findings. The findings of the present study revealed that the relationship between total knowledge according to total attitude and total practice of nursing informatics system was highly statistical significant. In this regards Gijare, (2012), revealed that providing feedback is necessary to improve knowledge, attitude, practices and so compliance to nursing informatics system standard in the world.

9. Conclusion and recommendations::

The current study concluded that, nurses are responsible for a substantial part of the patient record and hence are particularly affected by the computerization. The appliance of Information Systems into nursing provides important advantages in the administration of the nursing personnel's data, contributing to the improvement of the operating effectiveness of the Nursing Service (Malliarou et al., 2008). The use of nursing informatics system (NIS) has increased completeness of some nursing documentation elements. Also, the current study recommended that there is great variability among nursing schools and curricula. Professional skills learned and opportunities for employment are dependent on the quality and level of the educational programs. Proficiency in decision making and acquisition of technical competence to face new challenges are the major areas that must be improved in the nursing education curricula.

10. Acknowledgement

11. References

Table (1)

Frequency distribution of the study sample according to their socio-demographic characteristics (n= 90)

Variables	N	%	Variables	N	%
1. Age:			**6. Education:**		
▪ 20-30 years	76	84.4	▪ Nursing diploma	21	23.3
▪ 30-40 years	12	13.3	▪ Nursing institute	15	16.7
▪ > 40 years	2	2.3	▪ Faculty of nursing	54	60
2. Sex:			**7. Years of experience inside hospital:**		
▪ Male	17	18.9	▪ <1 year	36	40
			▪ 1-<3 years	22	24.4
▪ Female	73	81.1	▪ 3-5 years	32	35.6
3. Marital status:			**8. Years of experience outside hospital:**		
▪ Single	45	50	▪ <1 year	25	27.8
▪ Married	42	46.7	▪ 1-< 5 years	36	40
▪ Widow	1	1.1	▪ 5- 10 years	20	22.2
▪ Divorced	1	1.1	▪ > 10 years	9	10
4. Nurse job:			**9. Department:**		
▪ Specialist nurse	83	92.2	▪ Ground floor out-patient clinics	34	37.5
▪ Nurse supervisor	7	7.8	▪ First floor specialist outpatient clinics	23	25
5. Residence:			▪ Third floor specialist out-patient clinics	4	4.5
▪ Rural	30	33.3	▪ Home visits	2	3.4
▪ Urban	60	66.7	▪ Other	27	28.4

Table (2):

Frequency distribution of Nurses' knowledge related to patient care in nursing informatics system (n=90)

Variables (knowledge)	Worse		No Change		Improve	
	No	%	No	%	No	%
1. Access to information improved the ability to make patient care decisions.	0	0.0	0	0.0	90	100
2. Help decision making in patients care	0	0.0	7	7.8	83	92.2
3. Able to share important information with patients and families.	0	0.0	10	11.1	80	88.9
4. Able to involve patients and families in the care planning process.	0	0.0	6	6.7	84	93.3
5. Ability to learn and improve patient care processes.	2	2.2	5	5.6	83	92.2
6. The consistency with which patient care data are recorded.	1	1.1	9	10	80	88.9
7. The accuracy and validity of the patient care data being recorded.	0	0.0	3	3.3	87	96.7
8. The timeliness with which patient related data can be available	2	2.2	6	6.7	82	91.1
9. The timeliness with which patient care services are provided.	1	1.1	9	10	80	88.9
10. The overall safety of patient care.	0	0.0	3	3.3	87	96.7
11. The ability to implement research findings into patient care practices.	1	1.1	3	3.3	86	95.6

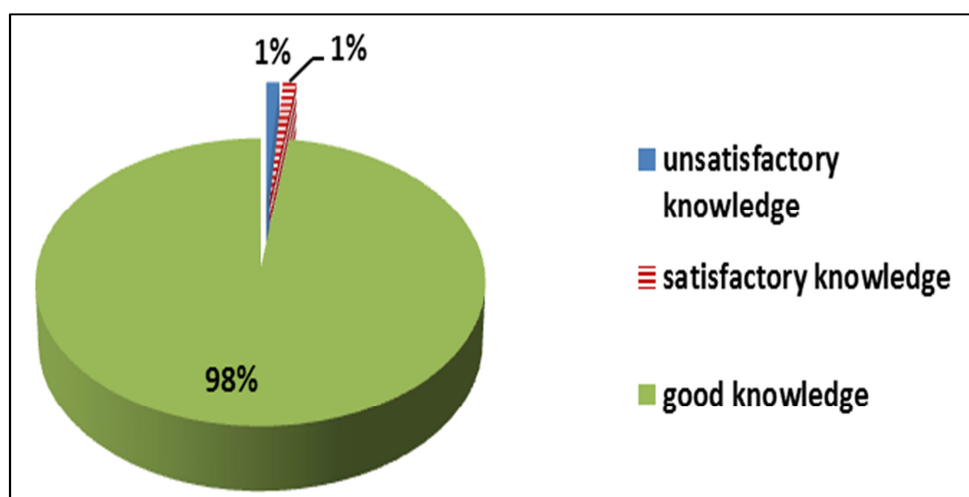Figure (1): Nurses' knowledge distribution of the study sample (n=90)

Table (3)

Frequency distribution of Nurses' practices related to nursing informatics system (n=90):

Practice Aspects	N	%
Access to computer easily (n= 89):		
▪ Yes	87	96.7
▪ No	2	2.2
Data entry:		
▪ Yes	85	94.4
▪ No	5	5.6
Nurses were chart on paper first, and then transfer data into the computer (n= 89):		
▪ Yes	33	36.7
▪ No	56	62.2
If yes, please explain why:		
▪ It is easy for me	27	30
▪ Not used to use computer directly	1	1.1
Dealing with different computers types (n= 89) :		
▪ Yes	85	94.4
▪ No	4	4.4
If No, Why?		
▪ Difficulty in dealing	2	2.3
▪ No experience in using it	2	2.3

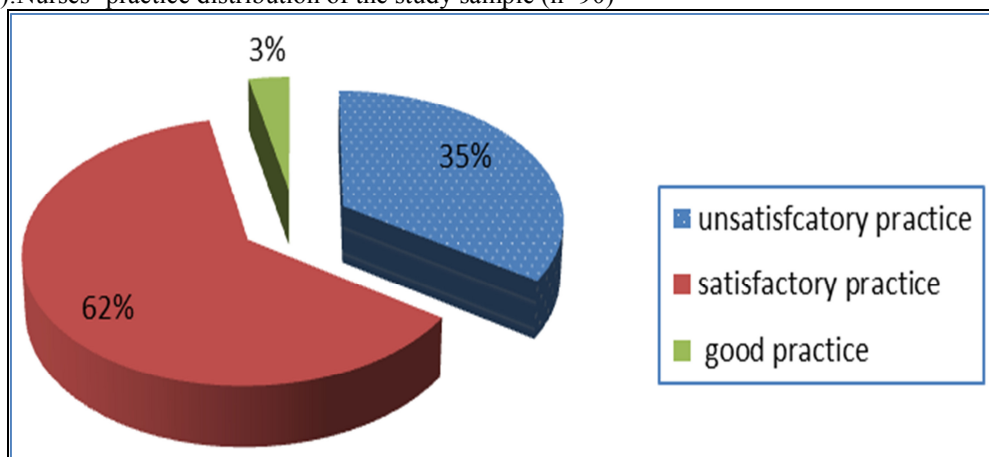Figure (2):Nurses' practice distribution of the study sample (n=90)

Table (5)

Frequency distribution of Nurses' attitude related to nursing informatics system (n=90):

Attitude Aspects	Strongly Disagree		Agree		Strongly Agree	
	No	%	No	%	No	%
1. Support the planned change in current nursing informatics system.	1	1.1	17	18.9	72	80
2. Coworkers support the planned change in nursing informatics system.	2	2.2	28	31.1	60	66.7
3. Supervisor supports the planned change in nursing informatics system.	3	3.3	21	3.3	66	73.3
4. It will have no difficulty in adapting to nursing informatics system changes.	1	1.1	27	30	60	66.7
5. Understand the decision to change nursing informatics system.	0	0.0	27	30	63	70
6. Know who the Super Users are on the work unit.	1	1.1	25	7.8	64	71.1
7. Sufficient resources have been provided to learn to use the new systems.	0	0.0	23	25.6	67	74.4
8. Sufficient technical information technology (IT) support will be available to operate the new system.	0	0.0	22	4.4	68	75.6
9. The nursing informatics system improves the ability to give patient care: a) the Right treatment	0	0.0	17	8.9	73	81.1
b) The Right patient.	1	1.1	20	20	69	76.7
c) In the Right amount, dose or intensity	0	0.0	22	24.4	68	75.6
d) In the right way	0	0.0	19	21.1	71	78.9
e) By the right person	0	0.0	20	22.2	70	77.8
f) With the right information	2	2.2	22	24.4	66	73.3
g) In the right location	0	0.0	23	25.6	67	74.4
h) At the right Time.	0	0.0	25	27.8	65	72.2

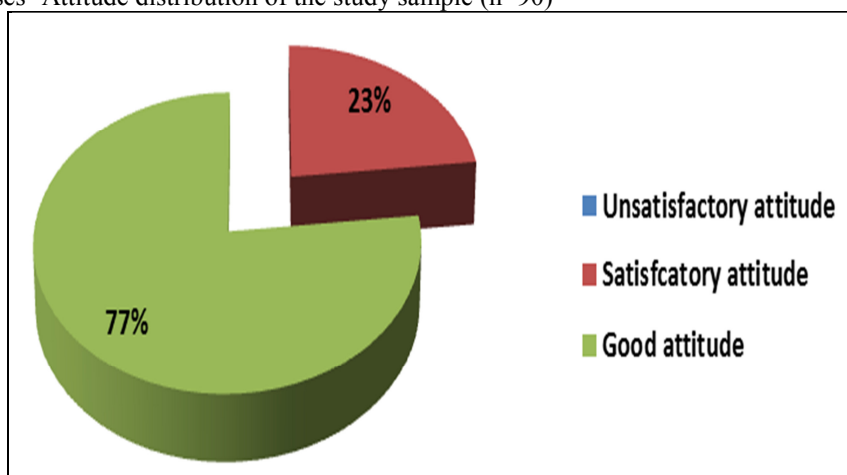Figure (3): Nurses' Attitude distribution of the study sample (n=90)

Table (5)
Relationship among total knowledge scores, total practice scores, and total attitude scores (n=90)

Variables		Total practice scores	Total attitude scores
Total attitude scores	R	.125	
	P	.242	
Total knowledge scores	R	.319	.334
	P	.003[**]	.002[**]

** P value is significant at level of < .01

Alhashem A. M., Shah, M.A., & Chowdhury, R.I. (2011). Factors influencing nurses' attitudes toward the use of computerized health information systems in Kuwaiti hospitals. Journal of Advanced Nursing. 57(4), 375–381.

American Medical Informatics Association's Nursing Informatics Working Group (2008). Nursing Informatics - A Historical Review Retrieved from http://www.duke.edu/~goodw010/AMIA/index. Html

Ammenwerth E, Eichstadter R, Haux R, Kutscha A, Pohl U & Ziegler S (2008a) A randomized evaluation of a computer-based nursing documentation system. Methods of Information in Medicine 40, 61–68.

Abdrbo, A. A., Hudak, C.A., Anthony, M.K., & Douglas, A.L. (2011). Moderating and mediating roles of nurses' beliefs: Information systems use among Ohio nurses.American Medical Informatics Association. 13, 668-675.

Grace O. and Modupe O.(2013). Nursing informatics: A key to improving nursing practice in Nigeria. International Journal of Nursing and Midwifery, Vol. 5(5), pp. 90-98, http://www.academicjournals.org/IJNM

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

Lee T-T (2005) Nurses' concerns about using information systems: analysis of comments on a computerized nursing care plan system in Taiwan. Journal of Clinical Nursing 14, 344–353.

Iliyasu Z1, Abubakar IS, Kabir M, Abbas SM.(2005). Computing knowledge, attitude and skills among healthcare professionals in Aminu Kano Teaching Hospital, Nigeria. Niger J Med. Apr-Jun;14 volume(2).

Mahler, C., Ammenwerth, E. and Wagner, A. (2007). Effects of a Computer based Nursing Documentation System on the Quality of Nursing Documentation. J Med System, 31: 274-282.

Malliarou, M. (2012). Policy of safety and guarantee of medical secrecy in electronic health record of patients. Master thesis National and Kapodistrian University of Athens, Nursing Department, Health Informatics, Athens.

Mari, T. (2014). American Medical Informatics Association's Nursing Informatics Working Group (2008). Nursing Informatics - A Historical Review Retrieved May 25, 2008 from http://www.duke.edu/~goodw010/AMIA/index. Html.

Moody ,L., Slocumb,E., Berg,R., and Jakson,D.(2014). Electronic Health Records
Documentation in Nursing: Nurses' Perceptions, Attitudes, and Preferences, Electronic Health
Records Documentation in Nursing, volume 22(6),Pp 337-344.

Raja E., Evangel J., Mahal R., & Masih, V., Barkat. (2011). An exploratory study to assess the computer knowledge, attitude and skill among nurses in health care setting of a selected hospital. Ludhiana, Punjab, India.

Roger W.(2012). Evaluating information systems in nursing: Evaluaton information systems in nursing, Journal compilation, volume (17) P.p 567–575.

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