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NURSES' PERCEPTIONS, ATTITUDES AND PREFERENCES IN USING ELECTRONIC DOCUMENTATION IN A PUBLIC HOSPITAL, SELANGOR

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ABSTRACT

Background: Electronic documentation consists of electronic care plans and nursing, classification as well as all aspects of patient care from charting admissions to discharge. The aim of the study is to determine the perceptions, attitudes, and preferences of nurses, as well as other factors related to the use of electronic documentation.

Materials and Methods: A cross-sectional design was used in this study. The data were collected from March until May 2017 using self-administered questionnaires; 95 nurses working in medical and surgical wards at a public hospital participated. $P<0.05$ was considered to be statistically significant, and data analysis was performed using IBM SPSS version 21.

Result: A total of 95 respondents participated in the study. The findings of this study showed that 61.1% had a positive attitude. The majority were female (90.5%). Among the respondents, 81.1% were aged ≤30 years old; 69.5% had ≤6 years working experience as a staff nurse; 43.2% had computer education, and 61.1% had previously received computer training. There were associations between computer education ($p<0.011$), computer training ($p<0.048$), and positive attitude.

Conclusion: The majority of the respondents had a positive attitude towards the use of electronic documentation. Electronic documentation should be included in formal nursing education to inculcate a positive attitude to electronic handover communication, which directly improves the quality of patient care.

Keywords: perceptions, attitudes, preferences, electronic health records, nursing documentation

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1.0 Introduction

In this era of globalisation, the advances in medical technology to meet the demands of the evolving healthcare environment have been rapid. Among these changes, electronic documentation (e-doc) has been introduced as a replacement for paper-based documentation in nursing. Electronic health records improve the efficiency through easy access to patient records by ensuring the integrity and security of patient data through authentication and various levels of access authority. The loss and misplacement of patient records and X-ray films, which is a common occurrence with physical paper folders, can be considerably reduced (Meum, Wangensteen, Soleng, & Wynn, 2011; Moody, Slocumb, Berg, & Jackson, 2004).

Electronic documentation should help the nurses in their nursing care. Hence, it is important to make sure that the implementation of electronic documentation meets the nursing care requirements and does not hinder communication among the health care providers. However, one of the problems in using electronic documentation is the difficulty in finding an available computer and the slow speed of the computer (Kelley Brandon & Docherty, 2011).
Ludwick and Doucette (2009) stated that the quality of care, patient safety, and the nurse-patient relations are not affected by the electronic documentation system. Furthermore, there was no significant difference in the time spent by nurses on documentation two months before and three months after the implementation of an electronic system (Munyisia, Yu & Hailey, 2011). Park and Han (2017) found that although most of the hospitals and clinics had sophisticated functionalities, their healthcare information exchange status was extremely low, which indicates the need for the standardization of ICT in the healthcare sector.

However, the level of implementation of electronic documentation is still low in Malaysia; less than 10% in the hospital setting (Ismail & Abdullah, 2012). In Malaysia, currently, the implementation of electronic documentation in public hospitals only occurs in the main public hospital in the capital of each state (Ismail, Jamil, Rahman, Bakar, Saad & Saadi, 2010). The study by Hassan & Tajuddin (2012) viewed the challenges and future prospects of the Total Hospital Information System (THIS), which includes the digital gap, knowledge and skills, system quality, redundancy, and data abundance. Moreover, Ismail, Abdullah, Shamsudin & Ariffin (2013) found that different categories of hospital information systems faced different issues and challenges. The nursing documentation is directly related to the EHR system in a hospital. Limited studies have been done in Malaysia on the perceptions of nurses in respect of the implementation of electronic documentation and their attitude towards the change in the documentation system. Importantly, Ismail et al. (2010) found that each Hospital THIS system has its own strengths and weaknesses. The aim of this study is to determine the nurses' perceptions, attitudes, and preferences in using electronic documentation in the inpatient units at a public hospital in Selangor.

2.0 Materials and Methods

This is a cross-sectional study in which a self-administered questionnaire adopted and modified from Moody et al. (2004) is used. This study was conducted at a public hospital in Selangor. This hospital is one of the public hospitals implementing the Total Hospital

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Information System (THIS) in their daily operation, which involves the use of electronic documentation. This hospital has 20 operating theatres, 19 wards, and 620 beds, and is equipped with tertiary hospital facilities for the community.

The inclusion criteria were staff nurses in the U29 & U41 categories. The exclusion criteria were foreign nurses and nurses who were on long sick leave. Data were collected from March 2017 until May 2017. A total of 95 nurses from were involved in this study which is the total population of nurses in two medical and two surgical wards.

A structured questionnaire of Usability Assessment Survey, which was adopted and modified from Moody et al. (2004), was used to investigate the participant's perceptions, attitudes, and preferences concerning the use of electronic documentation. The components of the questionnaire were divided into five parts: Section A, Section B, Section C, Section D, and Section E. A pre-test of the questionnaire was conducted in the orthopaedic ward at the same hospital; this ward was not included in the final study. Ten staff nurses were involved in the pre-test. The Cronbach's alpha test was used to assess the reliability of the scales in the questionnaire, for which an acceptable reliability of 0.77 was deemed adequate. The reliability of the pretested questionnaire was 0.820. Subsequently, questionnaires were distributed in the medical and surgical wards at the beginning of the shift, and the nurses were given until the end of their shift to answer the questionnaire. The researcher collected the questionnaires at the end of the shifts. The IBM Statistical Analysis Package for Social Sciences (SPSS for window version 20.0) was used in this study. The chi-square was used to determine the association between the socio-demographic data and nurses' attitudes towards the use of electronic documentation. Differences were considered statistically significant at $P<0.05$.

3.0 Result

A total of 95 sets of questionnaires were distributed to the respondents in the two medical and two surgical wards. All the respondents answered the questionnaire completely giving a response rate of 100%.

3.1 Socio-Demographic Characteristics

Table 1 shows that the age of the respondents ranged from 21 to 35 years old. They were divided into two age groups: ≤30 years old and >30 years old, with 81.1% falling within the ≤30 years old group and 18.9% in the >30 years old group. The majority of the respondents (90.5%) were female and the remaining respondents (9.5%) were male. The respondents were approximately evenly split with 49.5% from the medical ward and 50.5% from the surgical ward. Among the respondents, 43.2% had received computer education before or during their study, while 56.8% had not. Also, 61.1% of the respondents had previously attended computer training, while 38.9% had not attended any computer training. Additionally, the working experience of the respondents ranged from 1-12 years. The majority of the respondents (69.5%) had worked for ≤6 years while the remaining respondents (30.5%) had been working for >6 years. Furthermore, 76.8% had no prior experience of working with electronic documentation at another hospital, while 23.2% had prior experience.

Table 1: Frequency and percentage of the socio-demographic characteristics of the respondents (n=95)

Variables	N	%
Age (Mean=27.80;SD=3.096)		
≤30 years old	77	81.1
>30 years old	18	18.9
Gender		
Male	9	9.5
Female	86	90.5
Working unit		
Medical ward	47	49.5
Surgical ward	48	50.5
Computer education		
Yes	41	43.2
No	54	56.8
Computer training		
Yes	58	61.1
No	37	38.9
Working experience (Mean=4.97; SD=2.53)		
≤6 years	66	69.5
>6 years	29	30.5
Worked with electronic documentation before		
Yes	22	23.2
No	73	76.8

3.2 Perceptions of Using Electronic Documentation among the Respondents

Table 2 shows the results of the frequency of the respondents answering the questions regarding their perceptions of using electronic documentation. All the respondents claimed that computer access was usually available when needed. Most of the respondents (71.6%) indicated that they were experienced computer users and 95.8% felt confident in using electronic documentation. However, 73.7% of the respondents still performed charting on paper. The majority of the respondents (74.7%) believed that the current system is functional, while 86.3% mentioned that help is readily available when needed. Additionally, 71.6% felt that they worked in a computer-friendly environment. However, 74.7% reported frequent problems with the information system, and 85.3% were frustrated with multiple documentation systems.

Table 2: Frequency of perceptions of using electronic documentation among the respondents

Perceptions of using electronic documentation	Frequency (%)	
	Yes	No
Computer access usually available	95(100)	0
Experienced in use of computers	68(71.6)	27(28.4)
Nurses who felt confident using electronic documentation	91(95.8)	4(4.2)
Nurses who still chart on paper	70(73.7)	25(26.3)
Believe current system is functional	71(74.7)	24(25.3)
Help available when needed	82(86.3)	13(13.7)
Frustrated with multiple documentation systems	81(85.3)	14(14.7)
Have choice for data entry	81(85.3)	14(14.7)
Frequent problems with information system	71(74.7)	24(25.3)
Computer-friendly environment	68(71.6)	27(28.4)

3.3 Problems and Barriers in Using Electronic Documentation among respondents

Table 3: Frequency of problems and barriers to using electronic documentation

Problems and barriers	Respondents (n=95)	
	Frequency	Percentage (%)
Barriers		
Need to chart on paper first	20	21.1
Distractions during physician rounds	32	33.7
Laptop hung	30	31.6
Server down	13	13.7
Common problems		
Cannot locate laptop or desktop	24	25.3
Dead batteries	17	17.9
Not functioning well	54	56.8

Table 3 shows the barriers and common problems in using electronic documentation among the respondents. The respondents were only allowed to choose one answer from the choices given. As a result, 32 respondents (33.7%) answered distractions during physicians' rounds as the main barrier, while the rest chose the need to chart on paper first (21.1%), laptop hung (31.6%), and server down (13.7%) as the barriers to perform documentation in a timely and efficient manner. In addition, more than half of the respondents (56.8%) chose the main problem as being caused by the laptops or desktops not functioning very well.

3.4 Attitudes towards the Use of Electronic Documentation

The majority of the respondents answered positively for all the questions relating to their attitude towards the use of electronic documentation. Table 4 shows the frequency and percentage for each question and answer.

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Table 4: Frequency of attitudes towards electronic documentation

Attitudes towards electronic documentation	Frequency(%)				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Electronic documentation more a help than a hindrance to care	0	7(7.4)	34(35.8)	41(43.2)	13(13.7)
Electronic documentation has improved documentation	1(1.1)	4(4.2)	30(31.6)	49(51.6)	11(11.6)
Electronic documentation is less of a threat to privacy than paper records	0	5(5.3)	43(45.3)	37(38.9)	10(10.5)
Electronic documentation has decreased the workload of nurses	0	10(10.5)	31(32.6)	43(45.3)	11(11.6)
In time, electronic documentation will lead to improved patient care	1(1.1)	1(1.1)	39(41.1)	40(42.1)	14(14.7)

Among the respondents, 43.2% agreed that electronic documentation was more of a help than a hindrance to care. More than half of the respondents also agreed that electronic documentation improved documentation. However, 45.3% indicated that they were neutral concerning the threat to privacy arising from paper records. In addition, only 45.3% agreed and 11.6% strongly agreed that electronic documentation decreased the workload of nurses. Lastly, 42.1% of the respondents agreed that electronic documentation would lead to improved patient care.

The results concerning the level of the attitude towards the use of electronic documentation were grouped into two: negative attitude (score 1-17) and positive attitude (score 18-25) based on a median score of 18. Figure 1 illustrates that 38.9% of the respondents had a negative attitude and 61.1% of the respondents had a positive attitude.

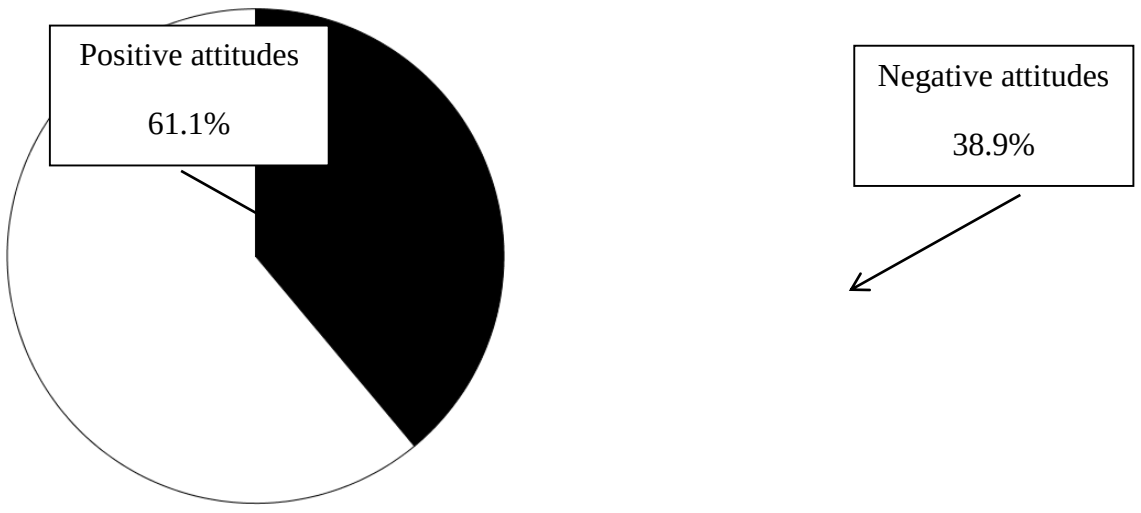

Figure 1: Level of attitude of respondents (n=95)

3.5 Preferred site for Electronic Documenting Methods of Clinical Data

Table 5: Frequency of preferences concerning the site for electronic documenting methods

Clinical data	**Frequency**(%)		
	Bedside	Nurses' station	Other site
Vital signs	34(35.8)	61(64.2)	0
Medications	67(70.5)	27(28.4)	1(1.1)
Admission assessment data	32(33.7)	63(66.3)	0
Progress notes	46(48.4)	49(51.6)	0
Ongoing assessment data	37(38.9)	58(61.1)	0

Table 5 shows the results of the staff nurses' preferences for the electronic documenting methods of clinical data. More than half of the respondents preferred the nurses' station for documenting vital signs, while 35.8% preferred the bedside. However, 70.5% of the respondents preferred to document medications at the bedside and only 1.1% preferred another site. About 33.7% preferred to document admission assessment data at the bedside, while the rest preferred the nurses' station. In addition, more than half of the respondents preferred the nurses' station for documenting progress notes and ongoing assessment data.

3.6 Association between Socio-Demographics and Nurses' Attitudes to Using Electronic Documentation

Table 8 shows no significant association between age, gender, working unit, and working experience, and attitude to using electronic documentation. However, there was a significant association ($p \leq 0.05$) for computer education and computer training.

Table 6: Association between socio-demographic data and attitudes to using electronic documentation (n=95)

Variables	Overall attitude, n(%)		X^2 value[a] (df)	P value
	Negative	Positive		
Age (Mean=27.80;SD=3.096)				
≤30 years old	27(28.4)	50(52.6)	2.576	.108
>30 years old	10(10.5)	8(8.4)	(1)	
Gender				
Male	3(3.2)	6(6.3)	0.132	.717
Female	34(35.8)	52(54.7)	(1)	
Working unit				
Medical ward	20(21.1)	27(28.4)	0.509	.476
Surgical ward	17(17.9)	31(32.6)	(1)	
Computer education				
Yes	10(10.5)	31(32.6)	6.428	**.011***
No	27(28.4)	27(28.4)		
Computer training				
Yes	18(18.9)	40(42.1)	3.921	**.048***
No	19(20.0)	18(18.9)	(1)	
Working experience				

(Mean=4.97;SD=2.53)				
≤6 years	25(26.3)	41(43.2)	0.104	.747
>6 years	12(12.6)	17(17.9)	(1)	
Worked with electronic documentation before				
Yes				
No	7(7.4)	15(15.8)	0.612	.434
	30(31.6)	43(45.3)	(1)	

** Significant level p < 0.05*

4.0 Discussion

This study indicated the nurses' opinions in terms of the functionality, problems, and attitudes to using electronic documentation. The majority of the nurses perceived that the limited number of computers reduced the opportunity for staff nurses to master computer skills (Chow Chin, Lee, Leung & Tang, 2012). However, in this study all the respondents stated that computer access was usually available in their unit, and that they felt confident in using the electronic documentation, which was in line with a study done by Oroviogoicoechea and Watson (2009). Similarly help was also readily available when there was a problem with the system. Effective information technology (IT) support would increase the satisfaction of the users and would help them to solve the problem promptly (Chow et al., 2012). More than half of the respondents still preferred to chart on paper. In the study by Kossman & Scheidenhelm (2008), they found that nurses preferred paper charts to the electronic documentation system.

The findings showed barriers to electronic documentation, such as duplicate charting on paper, distractions during physician rounds, laptop hanging and server down (Darbyshire, 2004; Kossman & Scheidenhelm, 2008), which made the computer slow and delayed the speed of documentation. More than half of the respondents mentioned computer malfunctioning, dead batteries and cannot locate laptop as the common problems encountered, which increased the time taken for documentation and reduced patient care (Johnson, 2013, Darbyshire, 2004; Likourezos Likourezos, Chalfin, Murphy, Sommer, Darcy, & Davidson, 2004; Timmons, 2003).
Younger nurses tended to have a positive attitude towards the use of electronic documentation (Oroviogoicoechea & Watson, 2009). Similarly, more than half of the respondents in this study aged less than 30 had a positive attitude towards electronic documentation (Moody et al., 2004), which included helped improve the documentation (Robles, 2009), decreased the workload (Likourezos et al., 2004), and improved patient care (Lee, 2006).

More than half of the respondents indicated that the electronic documentation system prevented documentation being done at the bedside for clinical data, while staff nurses preferred to perform charting of clinical data including vital signs, admission assessment data, progress notes, and ongoing assessment data at the nurses' station. The results may be influenced by the problems and barriers to using electronic documentation in which the majority of the nurses agreed that distractions during the physician rounds and computer not functioning very well were the main problems and barriers to performing charting in a timely

and efficient manner at the patient's bedside. This finding was congruent with Darbyshire, (2004); Moody et al. (2004), Likourezos et al. (2004), and Timmons (2003) who reported that creating a care plan some distance away, at the nurses' station, was due to the inadequate availability of computers.

In addition, the majority of staff nurses involved in this study had undergone a training session regarding the use of computers, which enabled them to accomplish the task quickly and improved their performance. Nurses who had prior experience of computer use favoured e-doc (Alquraini, Alhashem, Shah & Chowdhury, 2007; Ammenwerth, Mansmann, Iller & Eichstadter, 2003; Moody et al., 2004), and, potentially, were able to improve patient safety and the quality of care (Moody, 2004, Hobbs, 2002). Callen et al. (2013) confirmed that young nurses with computer skills found e-doc to be an easy task.

Formal computer training is necessary for nurses to master the tasks during documentation, and they would be more willing to spend time learning to use the electronic documentation system (Chow et al., 2012). Kaya (2011) agreed that nurse's attitudes to using electronic documentation were associated with computer science education but not age. Therefore, it is important to include e-doc knowledge in formal nursing education to facilitate and improve nursing handover communication.

5.0 Conclusion and recommendations

The findings of this study identified nurses' perceptions, attitudes, and preferences towards electronic documentation. The majority of the respondents had a positive attitude towards the use of electronic documentation. Socio-demographic characteristics, such as computer education and computer training, were significantly associated with attitude. These findings also indicated the need for an improvement in terms of the maintenance and information technology support for electronic documentation among staff nurses. The applicability of the study findings is limited by the small sample size and self-report method. Since this study was only conducted among medical and surgical ward nurses, a larger group of staff nurses involving other disciplines, such as orthopaedic, paediatric, and gynaecology, is desirable. A comparison study with public hospitals in other states could also be made.

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Declaration

No conflict of interest is declared

Authors contribution,

Author 1: proposal and data Collection, Author 2: proposal, manuscript writing.

References

Alquraini, H., Alhashem, A. M., Shah, M. A., & Chowdhury, R. I. (2007). Factors influencing nurses' attitudes towards the use of computerized health information systems in Kuwaiti hospitals. Journal of Advanced Nursing, 57(4), 375–381. DOI: 10.1111/j.1365-2648.2007.04113.x

Ammenwerth, E., Mansmann, U., Iller, C., & Eichstadter, R. (2003). Factors affecting and affected by user acceptance of computer-based nursing documentation: Results of a two-year study. Journal of the American Medical Informatics Association, 10(1), 69–84. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC150360/

Chow, S. K., Chin, W. Y., Lee, H. Y., Leung, H. C., & Tang, F. H. (2012). Nurses' perceptions and attitudes towards computerisation in a private hospital. *Journal of clinical nursing*, *21*(11- 12), 1685-1696. doi: 10.1111/j.1365-2702.2011.03905.x

Darbyshire, P. (2004). "Rage against the machine?" Nurses'and midwives' experiences of using computerized patient information systems for clinical information. Journal of Clinical Nursing, 13(1), 17–25. http://www.ncbi.nlm.nih.gov/pubmed/14687289

Hassan, R. & Tajuddin M. Z. M. (2012). Implementation of Total Hospital Information System (THIS) in Malaysian public hospitals: challenges and future prospects. *International Journal of Business and Social Research*, 2(2), 33-41

Ismail, A., Jamil, A. T., Rahman, A. F. A., Bakar, J. M. A., Saad, N. M., & Saadi, H. (2010). The implementation of Hospital Information System (HIS) in tertiary hospitals in Malaysia: a qualitative study. *Malaysian Journal of Public Health Medicine*, *10*(2), 16-24.

Ismail, N. I., & Abdullah, N. H. (2012). An overview of hospital information system (HIS) implementation in Malaysia. Retrieved from eprints.uthm.edu.my/2515

Ismail, N. I., Abdullah, N. H., Shamsudin, A., & Ariffin, N. A. N. (2013). Implementation differences of Hospital Information System (HIS) in Malaysian public hospitals. *International Journal of Social Science and Humanity*, *3*(2), 115. Retrieved from http://dx.doi.org/10.7763/IJSSH.2013.V3.208

Johnson, M., & Cowin, L.S. (2013). Nurses discuss bedside handover and using written handover sheets. Journal of Nursing Management, 21, 121–129. DOI: 10.1111/j.1365-2834.2012.01438.x

Kaya, N. (2011). Factors affecting nurses' attitudes toward computers in healthcare. Computers Informatics Nursing, 29(2), 121-129. doi: 10.1097/NCN.0b013e3181f9dd0f

Kossman, S. P., & Scheidenhelm, S. L. (2008). Nurses' perceptions of the impact of electronic health records on work and patient outcomes. *CIN: Computers, Informatics, Nursing*, *26*(2), 69-77.

Kelley, T. F., Brandon, D. H., & Docherty, S. L. (2011). Electronic nursing documentation as a strategy to improve quality of patient care. *Journal of nursing scholarship*, *43*(2), 154-162. doi: 10.1111/j.1547-5069.2011.01397.x

Lee, T. T. (2006). Nurses' perceptions of their documentation experiences in a computerized nursing care planning system. Journal of clinical nursing. doi: 10.1111/j.1365-2702.2006.01480.x

Likourezos, A., Chalfin, D. B., Murphy, D. G., Sommer, B., Darcy, K., & Davidson, S. J. (2004). Physician and nurse satisfaction with an electronic medical record system. Computers in Emergency Medicine, 27(4), 419–424. http://www.ncbi.nlm.nih.gov/pubmed/15498630

Ludwick, D. A., & Doucette, J. (2009). Adopting electronic medical records in primary care: lessons learned from health information systems implementation experience in seven countries. *International journal of medical informatics*, *78*(1), 22-31.

Meum,T., Wangensteen, G., Soleng, K.S., & Wynn, R. (2011). How does nursing staff perceive the use of electronic handover reports? A questionnaire-Based study. International Journal of Telemedicine and Applications, 6 pages doi:10.1155/2011/505426

Moody, L. E., Slocumb, E., Berg, B., & Jackson, D. (2004). Electronic health records documentation in nursing: nurses' perceptions, attitudes, and preferences. *Computers Informatics Nursing*, *22*(6), 337-344.

Munyisia, E. N., Yu, P., & Hailey, D. (2011). How nursing staff spend their time on activities in a nursing home: an observational study. *Journal of advanced nursing*, *67*(9), 1908-1917.

Oroviogoicoecheaa, C & Watson, R, (2009). A quantitative analysis of the impact of a computerised information system on nurses' clinical practice using a realistic evaluation framework. International Journal of Medical Informatics *78*, (12), 839-849. https://doi.org/10.1016/j.ijmedinf.2009.08.008

Park, Y.T., & Han, D. (2917) Current Status of Electronic Medical Record Systems in Hospitals and Clinics in Korea. Healthcare Informatic Research. 23(3),189-198. https://doi.org/10.4258/hir.2017.23.3.189

Robles, J. (2009). The effect of the electronic medical record on nurses' work. Creative Nurse, 15(1), 31–35. http://www.ncbi.nlm.nih.gov/pubmed/19343848

Timmons, S. (2003). Nurses resisting information technology. Nursing Inquiry, 10(4), 257–269. DOI: 10.1046/j.1440-1800.2003.00177.x