A*icE-Bs2022KotaKinabalu*

https://www.amerabra.org

10th Asia-Pacific International Conference on E-B Studies
The Magellan Sutera Resort, Kota Kinabalu, Sabah, Malaysia, 07-08 Sep 2022

Nurses' Attitude and Preferences towards Usage of Electronic Medical Records

Wan Marina Wan Ismail [1], Norhaini Majid [1], Ariani Fatmawati [2]

[1] Center for Nursing Studies, Faculty of Health Science, University Teknologi MARA, Selangor, Malaysia
[2] Faculty of Health Science, Aisyiyah Bandung University, Bandung, Indonesia

wanmarina13@gmail.com, majidnorhaini@gmail.com, ariani.fatmawati@unisa-bandung.ac.id
Tel: +60193991110

Abstract
Electronic Medical records document the treatment plan and patient care. This study intends to identify trained nurses' reception toward using EMR in the wards. A non-experimental cross-sectional survey covered the multi-discipline area. A stratified random sampling method in which the population in this research consisted of n= 138 trained nurses. Results found that the trained nurses tended to document the data at the nurse's station compared to the bedside entry. It's also shown that the demographics variable significantly correlated with attitude domains. Hence with the research results, it is envisaged to benefit the nurses and organization and hopefully can become the catalyst for the Ministry of Health in further improving and elevating the system throughout all hospitals in Malaysia.

Keywords: Attitude, Electronic medical record, Nurses, Preferences

1.0 Introduction

The accuracy and completeness of documentation in nursing have been emphasized in the nursing profession since the era of Florence Nightingale, which was in the mid-1800s. Amatayakul's (1999) statement that traditionally, patient health records have been done on paper and stored according to the arrangement of patient data. In this decade, many new technologies were invented and introduced to improve the efficiency and productivity of the nursing profession. The key to success in this technology starts from acceptance among nurses themselves to accept any change in their career. The documentation process began to change when computers were used in the late 20th century.

According to Roman (1982), computerized nursing documentation technology has evolved since 1960. In the late 1960s and early 1970s, the administrative department began to use computers in hospitals to make admissions, medical payments, and patient transfers to control the finances and management of the Hospital to become more systematic. The use of computers became significant when several support units in hospitals, such as pharmacies, imaging units, and laboratories, used computers when dealing with clients. The use of computers in the field of health has become a necessity for health practitioners and health service organizations.

The quality of patient record keeping is a primer responsibility of nurses. It supports the delivery of reasonable care, clinical decision-making, communication between healthcare workers, and continuity of care. Such records are also valuable resources for scientific research, quality assurance, and transparency of delivered care. This scenario influences the researcher to study on information technology in Malaysia. Hence this study aimed to determine the relationship between attitude and preferences and identity the relationship between demographic characteristics among nurses.

2.0 Literature Review

Accurate documentation in EMR provides a correct account of the treatment and care given to patients; this allows for good communication between nurses as a team in their daily patient caring activities and in making evidence-based decisions and planning healthcare delivery (Stevens & Pickering, 2010). Patients' daily records are considered legal documents and must accurately and honestly reflect nursing actions carried out for the patients (Maharaj, 2015). Despite the impact of the quality of patient record-keeping on patient health outcomes, many developing countries are experiencing problems in decision-making, planning processes, and performance evaluation of healthcare programs due to the poor quality of patient record-keeping (Ndabarora, Chipps & Uys 2014). There is limited evidence regarding the attitudes of nurses and preferences towards EMR among nurses had been explored in Malaysia, especially in the clinical setting.

Traditionally, nurses mostly communicate information about their patients verbally rather than through written communication (Jefferies, Johnson & Griffiths, 2010:113). In a similar study, 49% of nurses reported using verbal communication more than written communication, while 26% always used verbal communication more than written communication during the care of their patients (Mamseri, 2012). Evidence has shown that information that is not recorded is easily forgotten, which has a negative impact on the continuity (exchange of patient care information to the next health care team during patient handover) of patient care, particularly in very busy wards with high volumes of patients (Mamseri, 2012).

The quality of patient documentation is a prime responsibility of nurses, and it supports the delivery of good care, clinical decision-making, communication between healthcare workers, and continuity of care. Such records are also a valuable resource for scientific research, quality assurance, and transparency of the delivered care (Al-Harbi, 2011; Zegers et al., 2011). In practice, healthcare professionals usually record, retrieve and display patient information in two ways: in paper and computer-based records in which it is depending on the type of clinical setting and its patient record-keeping systems (Bani- Issa, Yateem, Makhzoomy & Ibrahim, 2016).

A study conducted to assess knowledge and utilization of computers among health workers in public hospitals in Ethiopia found inadequate knowledge of the use of computers (Mohammed et al., 2013). One of the knowledge characteristics reported by nurses was that electronic health records using computers facilitate nursing work through access to patient information, and improved organization and work efficiency (Stevens & Pickering, 2010). Nurses' use of computer-based records increased job performance and meant that they spent less time searching for records and the patients' charts (Mostert-Phipps, Pottas & Korpela, 2012). Health practitioners, managers, and policymakers are required to increase responsibility by setting up guidelines regarding resources, promoting accessibility to internet technology, health workers' computer skills, and effective integration from a paper-based patient record system to electronic health records (Cowie et al., 2017). Programs targeted at promoting knowledge and computer skills must be designed in order to enhance the knowledge and utilization of computers in the clinical setting in rural African health care (Mohammed et al., 2013).

Despite the emphasis on the importance of EMR to improve healthcare delivery, the attitudes, and preferences of nurses regarding the benefits of the quality EMR have not been assessed. Anecdotal evidence has also noted the lack of institutional policies regarding the quality of patient documentation in public hospitals, particularly nursing progress notes. The current nursing documentation framework is not ideal for the current healthcare environment, the anecdotal evidence has shown that the standard of nursing documentation is suffering because of busy clinical areas. Nurses do not document patient data timeously and accurately at the point of care (Blair & Smith, 2012). Nurses view documentation as a burden in some tasks, and documentation is not given a high priority for nurses compared to the patient care task (Ajami, 2016; Kohle-ersher, Chatterjee, Osmanbeyoglu, Hochheiser, & Bartos, 2012). The major barriers of patient record keeping identified where lack of time complete the record, increase patient overload, and inadequate supply of recording materials (Kohle-ersher et al., 2012). Moreover, literature suggested illegibility, time consumption, locating the record, and patient information in the record are task barriers associated with paper-based documentation, which resulted usually in delayed treatment for the patient (Prideaux, 2011). There is limited information on nurses' attitudes and preferences on EMR in HIS hospital.

3.0 Methodology

This study is a descriptive analysis, non-experimental cross-sectional survey that covers the multi-discipline area in Selayang Hospital. This research used a stratified random sampling method to cover six units of various disciplines, consisting of N = 185 trained nurses of job grade U29.The amount of n=138 trained nurses. Data collected was used from a questionnaire based mainly on the Vroom Model (1964) and was adapted by Burke (1991). Burkes discussed the increase in computer use in health care facilities. Burkes believed that by evaluating nurses' attitudes toward computers, predictions could be made regarding nurses' reactions to computerization. The purpose of the study was to measure nurses' computer attitudes and identify variables relating to attitudes utilizing Vroom's Expectancy Theory as a framework. Vroom's Theory explained that "satisfaction (preference for an outcome) x beliefs (the expectation that using

computerized programs will lead to the preferred outcome) = motivation" and the ultimate choice for or rejection of an act (Burkes, 1991, 193)

For data analysis, the researcher used the statistic program SPSS Version 24

3.1 Research Setting
A sample size of 138 nurses based on a population of 195 nurses participated in the research. The respondent was in 6 units, including Medical (n=26), Surgical (n=26), Obstetrics and Gynecology (n=26), Nephrology (n=22), Hepatology (n=18), and Pediatrics (n=20) in X Hospital.

3.2 Sample
A sample size of 138 based on the population of 195 has been selected to participate in the research. It included the number of staff working in various general wards in Selayang Hospital at the time of this study. A total of 138 questionnaires were returned out of 195 questionnaires to the researcher. Ten questionnaires were found incomplete. Hence, the usable questionnaires for this research were n=138.

3.3 Research Instrument
Three instruments will use to gather data for this study. The first instrument was a demographic questionnaire designed by the researcher. The first questionnaire collected information about the characteristics of the participants, including age, gender, education, and experience in nursing. The second question asks about the nurse's attitudes using computers- using an attitude questionnaire by Burke (1991). The third question asks about preferences aspects of their EMR documentation in the ward/units by Vroom's concepts (1964).

3.4 Sample Criteria
Inclusion Criteria included all registered nurses who work in 6 units or ward I> 6/12 and registered nurses with various backgrounds and levels of experience eligible to participate in this study. Exclusion Criteria for this study included the nurses who were not directly involved in patient care for less than six months, the nurse managers and staff nurses who refused to participate, and a staff nurse who did not rely on duty during the study period.

3.5 Procedure of Data Analysis
The data collected from the surveys were coded and entered into the Statistical Package for the Social Sciences (SPSS), version 23.0, for analysis. The questionnaire was coded and analyzed using descriptive correlation (Pearson's r Correlation Coefficient) and Chi- Square Test analysis.

4.0 Findings

4.1 Demographic Data
Demographic data for the entire sample (n=138) respondents. The characteristic included age, gender, level of education, years of work experience, and IT training program experiences in using the computer.

Table 1. Demographic Data of the Sample (n=138)

Variable	Mean	Std Deviation	Frequency (f)	Percentage (%)
Gender				
Male			138	00
Female			01	0
Age	30.83	0.669		
20-30 years			76	55.1
31-40 years			38	27.5
41-50 years			24	17.4
Year of Service				
1-5 years			51	37
6-10 years			48	34.8
11-15 years			11	8
16-23 years			4	2.9
24-25 years			24	17.4
Level of Education				
Certificate			33	23.9
Diploma			53	38.4
Advanced Diploma			43	31.2
Degree			9	6.5
IT Training				
Yes			98	71
No			40	29
Experinces in using Computer				
Yes			104	75.4
No			34	24.6

The sample consisted of more than 100 %(n=138) females 0% (0). The ages of the participant varied from the 20-30 years old category 55.1% (76), 31- 40 years 27.5% (38), and 41 and above 17.4% (24). Component of the level of education, it is found that mostly 38.4% (53) of nurses had a Diploma in Nursing, 31.2% (43) had an advanced diploma, and 23.9% (33) had a certificate in nursing. Only 6.5% (9) had a bachelor's degree.

Their years of experience in nursing were quite varied. Years of experienced ranged from 51 respondents 37% falling into the one to five years category, respondents 34.8% (48) falling in 6-10 years, 17.4% (24) within 24-25 years, 11-15 years, 8% (11) and only four nurses had 16-23 years of experiences. In the demographic questionnaire, there were two questions asked about whether the nurses experience services using the computer and attending IT courses, it was found that 75.4% (104) had experience compared with 24.6% (34) with no experience using it, and 71% (98) had attended the course, 29% (40) not attending any classes regarding IT.

4.2 Respondent's attitude towards usage of EMR

Table 2. Attitude Towards EMR

Items	Overall Score	
	Mean	SD
Total Score Attitude	29.02	8.712
Belief Domain	11.65	3.62
Satisfaction Domain	7.64	2.96
Motivation Domain	9.73	3.37
	Frequency	Percentage
Positive Attitude	100	72.5
Negative Attitude	38	27.5

Overall, the mean score of nurses' attitudes is with a mean of 29.03 and a standard error of 8.712. For the belief domain, the mean score is 11.65, with a standard error of 3.62, while the motivation domain has a mean score of 7.64 with a standard error of 3.37. While the satisfaction domain means the score is 7.64 with a standard error of 2.96. In answering the objective to identify the attitude (belief, satisfaction, and motivation) of nurses toward the use of EMR in hospitals in Selangor, it was found in the frequency analysis that 100 (72.5%) respondents were positive toward the use of EMR while 38 (27.5%) respondents were negative towards the use EMR.

4.3 Location of Nurse's Preferences during clinical Data Entry using EMR

Table 3. Location Preferences Clinical Data Entry using EMR

Item	Bedside		Nurse Station	
	Frequency	Percentage	Frequency	Percentage
Vital Signs	91	65.9	47	34.1
Medication	99	71.7	39	28.3
Admission	39	28.3	99	71.7
Progress Note	54	39.1	84	60.9
Ongoing Assessment	75	54.3	63	45.7
Discharge/Admission	25	18.1	113	81.9
Laboratory Results	32	23.2	106	76.8

The location of nurses tendency when using EMR in entering clinical data results by using percentage frequency for bedside location found that respondents are more likely to record medicine with the highest frequency of 99 (71.7%), followed by vital signs 91 (65.9%) and the lowest in the ongoing assessment of the patient which is 75 (54.3%) by the respondent.

While the location of the tendency of nurses when using EMR in entering clinical data results by using the percentage frequency for the site of the nurse station of nurse's counter found that respondents are more likely to record the discharge and transfer of patients, which is 113(81.9%), followed by recording the patient's laboratory results 99(71.7%) and the lowest is recording patient progress which is 84 (60.9%) by the respondent's.

4.4 Relationship between Respondent's Age and Attitude towards EMR

The output of the Pearson correlation showed a significant negative linear relationship between age and nurses' attitudes towards EMR. The longer the service period, the more negative they become towards EMR (those with > 10 years of service). The research outcomes are similar to Marasovic et al. (2011), which found that nurses with shorter service periods and lesser experience have a high motivational attitude toward computers. However, there were no specific service periods that can be concluded to explain the change of attitude and service period. All three domains are significant, with $p<0.05$.

4.5 Relationship between Respondent's Length of Service and Attitude towards EMR

The output of the Pearson correlation showed a significant negative linear relationship between age and nurses' attitudes towards EMR. The longer the service period, the more negative they become towards EMR (those with > 10 years of service). The research outcomes are similar to Marasovic et al. (2011), which found that nurses with shorter service periods and lesser experience have high motivational

attitudes toward computers. However, no specific service period can be concluded to explain the change of attitude and service period. All three attitude domains are significant, with $p<0.05$.

4.6 Relationship between Attitude Domains and Education Level

Table 4. Attitude Domains and Level Education

Attitude Domain	Relationship	X^2	p
Belief	Education Level	22.87	0.001
Satisfaction	Education Level	52.4	0.001
Motivation	Education Level	29.14	0.001

Chi-square test revealed a relationship between attitude domain and education level where respondents with diploma & degree levels are more favorable. Moody al. l (2004) have similar results, with three domains being significant with $p<0.05$. Hence according to him, an increase in education can change one's perspective

4.7 Relationship between Attitude Domains with Experience using Computers

Table 5. Attitude Domains and Computing Experience

Attitude Domain	Relationship	X^2	p
Belief	Computing Experience	1.57	0.21
Satisfaction	Computing Experience	9.7	0.002
Motivation	Computing Experience	7.54	0.006

The Chi-square test revealed a relationship between experience using computers with satisfaction and motivational domains. These research results are similar to Liu et al. (2011) and Getty (2000), where the experienced people using computers have high 'self-satisfaction' and motivation to perform good documentation proc. endures.

4.8 Relationship Between Attitude Domains with Attendance of Computer Courses in Hospital.

Table 6. Attitude Domains with Computer Course

Attitude Domain	Relationship	X^2	p
Belief	Attended Computer Training	0.21	0.647
Satisfaction	Attended Computer Training	4.227	0.04
Motivation	Attended Computer Training	1.874	0.171

The Chi-square test revealed a relationship between satisfaction domain with attendance of computer courses in the Hospital. The results are similar to Lee et al. (2002), where it was shown that they are highly motivated and of high belief; even though they did not participate in the course, they did not get satisfaction while attending the system, and the impact of the computer course within two weeks did not provide satisfaction to the attending nurses

5.0 Discussion and Recommendation

Overall, this research finds that the nurses react positively to using EMR at Selayang Hospital. Nevertheless, there were a few who responded negatively to the system. Further research is needed to identify the factors influencing the nurses' attitudes toward improvement. The nurses also have preferences for documentation and clinical data entry with evidence preferences towards the type of data to be entered, according to comfort, privacy, and volume of computers in each respective ward.

Borchers (2014) stated that the best way for nurses to improve the quality of using computerized documentation is to encourage them to be directly involved in making changes to the system and to identify their attitudes and tendencies towards using EMR. It has also been stated by Allan (2012) after evaluating their attitude. As a result, nurses can reduce the time to do documentation, increase consistency, and feel comfortable. The quality of patient care is better. A few strategic planning for nursing reports that will increase time quality, reduce workload, and increase the quality of patient care, automation unit needs to analyze the documentation workflow in all units to identify the work procedures needed to be given priority to be incorporated into EMR system. Identifying several aspects of effective documentation at 'bedside' and 'nursing station' locations. Future research recommended identifying factors influencing nurses in choosing the right location.

Limitations generalization to all areas of nursing will be limited due to the small sample p[population representation from the department. The study will also be limited using one web based EMR. The study will focus on nurses' perceptions and factors contributing to nurses attitudes and preferences towards EMR in the future.

6.0 Conclusion

In conclusion, this study is to evaluate the attitude of nurses toward the existing EMR and to identify the tendency of nurses in computerized documentation. Nurses are the most critical users for assessing the extent to which the effectiveness of the EMR can make a difference

in holistically improving the quality of care and documentation of patient records. Improving computer access at work, EMR training, and basic computer literacy are all necessary to enhance nurses' attitudes about EMR systems. One of the most important conclusions given in this study is that of poorly suited EMR systems. People exposed to inadequate EMR systems during their initial experience with electronic information systems acquire an unfavorable attitude about EMRs. As a result, before installation, implementers and high-level managers should verify the EMR system's applicability.

Acknowledgments

Paper Contribution to Related Field of Study

The result of this study perhaps could be used to develop a policy and guidelines on human resource management and career development for nurses in the future.

References

Ajami, S. (2016). Use of speech-to-text technology for documentation by healthcare providers. The National Medical Journal of India, 29(3), 148–152.

Allan J & Englabright J (2012) Patient-centered documentation an and effective and efficient use of clinical information system. Journal of Nursing Administration 30, 90-95.

Al-Harbi, A. (2011). Healthcare providers' perceptions towards health information applications at King Abdul-Aziz medical city, Saudi Arabia. International Journal of Advanced Computer Science and Applications, 2(10), 10–13.

Amatayakul, M. (1999). The 199 comprehensive guides to electronic health records. New York: Faulkner and Gray

Bani-Issa, W., Al Yateem, N., Al Makhzoomy, I. K., & Ibrahim, A. (2016). Satisfaction of healthcare providers with electronic health records and perceived barriers to its implementation in the United Arab Emirates'. International Journal of Nursing Practice, 22(4), 408–416.

Bisbal, J., & Berry, D. (2011). An analysis framework for electronic health record Systems. Methods of Information in Medicine, 50(02), 180–189. Borchers, E.L (2014). Improving nursing documentation for private-duty home health care. Journal of Nursing Care Quality, 13 (5),24-43

Blair, W., & Smith, B. (2012). Nursing documentation: Frameworks and Barriers. Contemporary Nurse, 41(2), 160–168.

Burkes, M. (1991). Identifying and relating nurses' attitudes toward computer use. Computers in Nursing, 9(5), 190-200.

Cowie, M. R., Blomster, J. I., Curtis, L. H., DuclauX, S., Ford, I., Fritz, F., & Michel12, A. (2017). Electronic health records to facilitate clinical research. Clin Res Cardiol, 106, 1- 9.

Hector, D. (2010). A retrospective analysis of nursing documentation in the intensive care units of an academic hospital in the Western Cape'. Doctoral dissertation. University of Stellenbosch.

Jefferies, D., Johnson, M., & Griffiths, R. (2010). A meta-study of the essentials of quality nursing documentation. International Journal of Nursing Practice,16(2), 112–12

Kohle-ersher, A., Chatterjee, P., Osmanbeyoglu, H. U., Hochheiser, H., & Bartos, C. (2012). Evaluating the barriers to point-of-care documentation for nursing staff. Computers, Informatics, Nursing, 30(3), 126–133.

Liu J, Pothiban L, Khamphonsiri T, Computer knowledge attitude and skills of nurses in Peoples Hospital of Beijing Medical University, Comput Nurs. 2000;18(4):197-206

Maharaj, P. (2015). Evaluating the use of nursing care plans in general practice at a Level 3 Hospital in the Uganda District of KwaZulu-Natal: A case study, unpublished Master's dissertation. Durban: Durban University of Technology.

Mamseri, R. A. (2012). The nursing process as a means of improving patient care, unpublished Master's dissertation. Pretoria: UNISA.

Marasovic, C., et al. Attitudes of Australian nurses towards the implementation of a clinical information system. Computers in Nursing. 2011. 15(2):p.91-8

Moody, L.E., Electronic health case records documentation in nursing: nurses' perception, attitudes, and preferences. CNI: Computers, Informatics, Nursing. 2004 22(6):p.337-44

Mohammed, E., Andargie, G., Meseret, S., & Girma, E. (2013). Knowledge and utilization of computer among health workers in Addis Ababa hospitals, Ethiopia: Computer literacy in the health sector. BMC Research Notes, 6(1), 106.

Mostert-Phipps, N., Pottas, D., & Korpela, M. (2012). Improving continuity of care through the use of electronic records: A South African perspective. South African Family Practice, 54(4), 326–331.

Ndabarora, E., Chipps, J. A., & Uys, L. (2014). Systematic review of health data quality management and best practices at community and district levels in LMIC'. Information Development, 30(2), 103–120.

Ngao, M. N. (2015). Assessing Barriers to Implementation of Nursing Process among Nurses Working at Machakos level 5 Hospital'. unpublished Doctoral dissertation. University of Nairobi.

Olivier, J. M. (2010). Record keeping: Self-reported attitudes, knowledge and practice behaviors of nurses in selected Cape Town hospitals'. Unpublished Doctoral dissertation. University of Cape Town.

Prideaux, A. (2011). Issues in nursing documentation and record-keeping practice. British Journal of Nursing, 20(22), 1450–1454. Romano C (1982) Nursing documentation: a model for a computerized database. Advance in nursing Sciences 5, 443-456

Shihundla, R. C., Lebese, R. T., & Maputle, M. S. (2016). Effects of increased nurses' workload on quality documentation of patient information at selected primary health care facilities in Vhembe District, Limpopo Province. Curations, 39(1), 1–8. Stevens, S., & Pickering, D. (2010). Keeping good nursing records: A Guide. Community Eye Health, 23(74), 44.

Sukums, F., Mensah, N., Mpembeni, R., Kaltschmidt, J., Haefeli, W. E., & Blank, A. (2014). Health workers' knowledge of and attitudes towards computer applications in rural African health facilities. Global Health Action, 7(1), 24–34.

Vroom VH. Work and motivation. Hoboken, NJ: Wiley; 1994