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Patient Care Delivery: Electronic Nursing Documentation in Malaysia

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Abstract

Background: The evolution of nursing documentation from paper to electronic format aims to improve patient safety and care quality. This study aimed to determine the knowledge and attitudes of registered nurses toward electronic nursing process documentation.

Methods: This cross-sectional study was conducted among 189 registered nurses who work in medical wards at a teaching hospital in Kuala Lumpur. Simple random sampling was used. Respondents' knowledge of electronic nursing documentation was measured using a questionnaire developed by Guedes, and their attitudes toward electronic nursing documentation were measured using a questionnaire developed by Hagos. Data analysis was performed using Statistical Package for the Social Sciences Statistics 26.0 for Windows and $p < 0.05$ was considered significant.

Results: In this study, 50.8% of the respondents have a low knowledge level of electronic nursing documentation, and 89.4% have a positive attitude toward electronic nursing documentation. No significant relationship was found between sociodemographic factors, such as age, education level, working experience, knowledge level, and attitude, and electronic nursing documentation.

Conclusions: Nurses had a higher knowledge level of and positive attitudes toward electronic nursing documentation. A longitudinal and comparative study was suggested for further research.

Keywords: electronic health records, Malaysia, medical nursing

INTRODUCTION

Nursing is critical for caring, maintaining, and protecting the health of the global population. Nurses make up about a quarter of the world's workforce, accounting for more than half of all healthcare professionals.[1,2] In 2018, approximately 16,373 nurses in Malaysia were working in hospitals and public health, with a ratio of 1 to 304 patients.[2] In addition to treating patients, nurses are responsible for providing adequate documentation to plan for efficient nursing care for patients. The preparation of nursing process documentation plays a vital role in identifying patients' problems, planning, implementing, and evaluating nursing interventions. Indeed, adequate documentation can improve the safety and quality of life of a patient and lower the morbidity rate.[1–3]

Safe and efficient nursing care remains a crucial factor in improving the health of patients in healthcare facilities. For centuries, the nursing process is considered a written proof of nursing practices.[4] Proper use of the nursing process can update the planning and implementation of care, and if there are any changes, the intervention can be administered accordingly. A well-organized nursing process can assess the patient's overall health status, which helps tailor the current needs of the patients and treatment response.[4]

The nursing process remains an integral component of providing optimal and holistic healthcare.[4] This documentation can assess patients' problems and implement and evaluate the nursing interventions provided. Briefly, documentation can be recognized as proof of inpatient care. A study conducted in Malaysia found that more than half of the respondents had a positive attitude toward electronic documentation, and they express confidence in using the electronic documentation system.[5] A positive attitude toward electronic nursing documentation is associated with computer education and training.

Essentially, the successful implementation of nursing documentation, either by paper or electronically, could make nursing care be more accessible and increase nurses' time on delivering care.[6,7] In addition, electronic nursing documentation introduces contemporary features such as copy and paste, electronic interfaces, and prearranged dropdown menus that are not available in paper-based documentation.[5] This feature can improve nurses' recording and thus can enhance the quality of nursing care.

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Previous studies have found that nurses with higher computer skills have more positive attitudes toward the use of electronic health records, so they can improve patient care and value.[8,9] Some data indicate that implementing an electronic nursing documentation system in acute hospital settings saves time and reduces rates of documentation errors, falls, and infections.[10–12] Undeniably, the quality of patient care increases when the nursing documentation is tailored to each patient.[3] This feature can improve nurses' records and thus enhances the quality of nursing care.

Kelley, Brandon, and Docherty (2011) highlighted an unclear relationship between electronic nursing documentation and improving patient outcomes.[10] Several factors can influence the lack of compliance in nursing documentation, such as nurses' lack of knowledge of the purpose of documentation and the principles of nursing process documentation.[13] Hagos (2014) highlighted that non-exposure to computers is a factor of non-compliance in documenting nursing care.[14] A review study also reported that poor knowledge of the literal meaning of the nursing process had increased the rate of the improper use of nursing documentation.[13]

Moreover, previous studies have shown that more than three-quarters of hospitals use electronic documentation to manage their patients and improve efficiencies in the hospital.[4,10] Nevertheless, less than 29% of the electronic nursing care plan is systematically documented following the standard of nursing classification systems such as NANDA-I.[15] Gazari et al. (2020) stated that electronic health records are inadequate if used alone to support the work of nurses, especially during the submission of reports for each work shift, causing them to rely on paper forms[4]

The question is to what extent nurses could identify and document appropriately and accurately patient's problems and the level of treatment needed by the patients. This is anticipated to result in practice errors, and the lack of quality of treatment will decrease the performance value of nurses. Thus, a knowledge gap may lead nurses to provide treatment to patients without thinking critically. Nurses' irrelevant actions will increase the treatment cost. Therefore, this study was conducted to determine the knowledge level of and practices toward electronic nursing documentation among medical registered nurses at a teaching hospital in Kuala Lumpur.

METHODS

Ethical approval was obtained from the Hospital Universiti Kebangsaan Malaysia and the Faculty of Medicine UKM research ethics committee before conducting the study. In addition, all participants provided written informed consent before participation. This quantitative cross-sectional study was conducted to identify the knowledge level and practices of electronic nursing documentation among 189 registered nurses who work in medical wards at a teaching hospital in Kuala Lumpur. Simple random sampling method was used, and this sampling method gives everyone in the population an equal chance of being included in the sample. The exclusion criteria were as follows: nurses on leave for more than 3 months and nursing students who had a clinical placement in the medical wards. The total population was 278 nurses. The sample size was calculated using the methods reported by Krejcie and Morgan (1970). With an accepted margin of error of 5% and a 95% confidence interval, the sample size consisted of 203 respondents. The inclusion rate was 93.1% (189 respondents), which included nurses who did not participate due to having a long leave, such as maternity leave, and refused to participate in the study.

This study was conducted at the medical wards of a teaching hospital in Kuala Lumpur. This is a government-funded hospital that provides secondary and tertiary treatment services and is a referral center from all over the country. Furthermore, this hospital has established strengths and excellence in the fields of psychiatry, pediatrics, neurology, neurosurgery, neonatology, nephrology, hematology, gynecology, endocrinology, and spinal surgery.

In this study, nurses' knowledge of and attitudes toward electronic nursing documentation are measured using a self-administered questionnaire. The knowledge level of electronic nursing documentation was measured using questionnaires developed by Guedes.[16] This instrument consists of five items with a Likert's scale range of 1 (none) to 4 points (a lot) (4). Accordingly, poor knowledge is characterized by scores <15, whereas good knowledge is defined by scores >15. For this, questionnaires have an excellent internal consistency by Cronbach's alpha of 0.88.

Meanwhile, attitudes toward electronic nursing documentation were measured with a questionnaire developed by Hagos.[14] This questionnaire has good internal consistency, with Cronbach's alpha of 0.88. Furthermore, this questionnaire consists of 20 items and uses Likert's scale, ranging from strongly disagree (1) to strongly agree (5). There are 10 positive questions (questions 1, 2, 3, 5, 6, 9, 11, 12, 15, and 16) and 10 negative questions (questions 4, 7, 8, 10, 13, 14, 17, 18, 19, and 20). The total score is 100, and the 50% cut-off points from the maximum total score achievable were used in this study. A score of ≤50 points indicates a negative attitude toward electronic nursing documentation. At the same time, scores 51–100 points are defined as a positive attitude toward electronic nursing documentation

The data collection process began in April and May 2020 among registered nurses working in the medical wards. At the start of the study, the researchers approached nurses

who met the inclusion and exclusion criteria of the study. Each eligible respondent was explained the study objectives, and respondents who agreed to participate in the study signed the consent form provided before filling out the questionnaire. The response rate was 100%.

Data were analyzed using the Statistical Package for the Social Sciences Statistics 26.0 for Windows. The significance level was set at $p \leq 0.05$. Descriptive analyses were conducted to indicate the distributions of the demographic and inferential analyses, such as the chi-square test.

RESULTS

A total of 189 respondents participated in this study, and the sociodemographic characteristics are presented in Table 2. In this study, 65.6% of the respondents were <30 years old. Most of the respondents were educated up to the diploma level (69.3%) and have worked <10 years (91.0%). In addition, 50.8% of the respondents had a low knowledge level of electronic nursing documentation and 89.4% had a positive attitude toward electronic nursing documentation (Table 1).

This study shows that the mean attitude value toward electronic nursing documentation was 1.95–3.85, and the mean knowledge level of electronic nursing documentation was 3.29–3.37. The mean and standard deviation of electronic nursing documentation knowledge level were: assessment (3.37±0.56), interview (3.31±0.55), diagnosis (3.29±0.56), prescriptive (3.36±0.58), and evaluation (3.30±0.60). In this study, 55.0% of the respondents had moderate knowledge of nursing assessments, 60.3% had moderate knowledge of nursing interviews, and 59.8% had moderate knowledge of nursing diagnosis. Moreover, 71–79 respondents had a high knowledge level of nursing implementation and nursing evaluation (Table 2). Meanwhile, the distributions of attitude toward electronic nursing documentation are displayed in Table 3.

This study revealed that age, education level, and working experience were not associated with the knowledge of the electronic nursing documentation. Factors such as age, education level, and working experience are also not significantly associated with attitude toward electronic nursing documentation. The results are presented in Table 4.

DISCUSSION

This study was conducted to identify the knowledge and practices of electronic nursing documentation among 189 registered nurses who work in medical wards at a teaching hospital in Kuala Lumpur. In this study, the majority of the respondents were registered nurses aged <30 years, had worked <10 years, and studied until diploma level. Most of the respondents preferred electronic nursing documentation over paper-based documentation to write the patient care plan. Respondents also have a high knowledge level of electronic nursing documentation. This study reported that nearly 50% of the respondents had a high level of knowledge of the electronic nursing process, which consists of nursing assessment, interview, diagnosis, prescription, and nursing evaluation. In this study, the knowledge of a registered nurse of the electronic nursing documentation was measured using a questionnaire developed by Guedes.[16] The results of the present study are similar to those reported by a previous study.[17] Ebrahem *et al*. (2014) found that nurses had good knowledge of and positive practice toward electronic

TABLE 1. Distributions of sociodemographic factors (N = 189)

Sociodemographic factors	Frequency (N)	Percentage (%)
Age		
<30 years	124	65.6
>30 years	65	34.4
Level of education		
Diploma level	131	69.3
Degree level and above	58	30.7
Working period		
<10 years	172	91.0
>10 years	17	9.0
Types of nursing documentation preferred		
Electronic	180	95.2
Paper-based	9	4.8
Level of knowledge toward electronic nursing documentation		
High level	96	50.8
Low level	93	49.2
Attitude toward electronic nursing documentation		
Positive attitude	169	89.4
Negative attitude	20	10.6

TABLE 2. Knowledge level of electronic nursing documentation (N = 189)

Items	None F (%)	Little F (%)	Moderate F (%)	A lot F (%)
Nursing assessment	-	7 (3.7)	104 (55.0)	78 (41.3)
Nursing interview	-	8 (4.2)	114 (60.3)	67 (35.4)
Nursing diagnosis	-	10 (5.3)	113 (59.8)	66 (34.9)
Nursing implementation	-	10 (5.3)	100 (52.9)	79 (41.8)
Nursing evaluation	1 (0.5)	11 (5.8)	106 (56.1)	71 (37.6)

TABLE 3. Distributions of attitudes toward electronic nursing documentation (N = 189)

Attitude toward nursing documentation	Strongly disagree (%)	Disagree (%)	Not sure (%)	Agree (%)	Strongly agree (%)
I like the aim of the nursing process.	3.7	9.0	8.5	64.6	14.3
I am convinced that the nursing process will work if applied in inpatient care.	7.4	4.8	3.7	63.5	20.6
The nursing process is an elaborated Kardex system.	2.1	11.1	15.3	60.3	11.1
The nursing process should be used by nurses with a bachelor's degree and above only.	2.6	24.3	19.6	30.2	23.3
The nursing process can be used in rehabilitation settings.	2.6	9.5	9.0	57.1	21.7
The nursing process works well in practice.	4.8	8.5	11.6	57.1	21.7
The nursing process can be used in any setting.	24.3	3.7	10.6	60.8	5.0
There is not enough time to apply the nursing process during patient care.	4.8	15.3	19.6	32.8	27.5
The nursing process is a waste of time.	2.6	10.1	11.6	58.7	16.9
I am ready for the application of the nursing process.	1.1	16.4	34.9	28.6	19.0
The Kardex system of nursing records is unsatisfactory.	3.7	11.1	5.3	61.9	18.0
The process simplifies the awareness of patients' needs.	2.1	12.2	9.0	57.7	19.0
Priorities of care are easy to identify using the nursing process.	6.9	16.4	16.4	37.6	22.8
I am fed up with hearing about the nursing process.	27.5	38.1	18.5	12.2	3.7
The nursing process involves too much paperwork.	3.2	8.5	11.1	57.1	20.1
The nursing process enables nurses to provide quality nursing care to patients.	0.5	12.2	19.6	51.3	16.4
I am willing to apply the nursing process during patient care.	6.9	20.6	29.1	31.7	11.6
I think the introduction of the nursing process will cause a problem.	6.9	20.6	29.1	31.7	11.6
I think the patients will not like to be cared for using the nursing process.	5.3	15.9	35.4	27.5	15.9
I think the nursing staffs are unwilling to apply the nursing process.	5.3	11.6	36.0	32.3	14.8

TABLE 4. Relationship among the sociodemographic factors, knowledge level, and attitude toward electronic nursing documentation (N = 189)

Sociodemographic factors	Nursing process	
	Knowledge level	Attitude
Age	$p = 0.16$	$p = 0.28$
Education level	$p = 0.28$	$p = 0.56$
Working period	$p = 0.50$	$p = 0.24$

nursing documentation. A possible explanation is that they are proficient in data entry.[17] Nurses who have a higher knowledge level of using computers more effectively used electronic documentation to record patient care.[8] By contrast, nurses did not have a high knowledge level of the benefits of using an electronic documentation system. Essentially, nurses were more skeptical of the role of computer information systems in assisting them, reducing cost, improving healthcare quality, and applying the documentation system into their daily work routine.[18] However, this finding is contrary to those of previous studies, which found that nurses had insufficient knowledge of electronic nursing documentation, especially those who were unfamiliar with the standard operation of nursing documentation.[18–20] Indeed, nurses who are unfamiliar with the nursing standards of documentation are 2–3 times likely to not document their patient care plan correctly, and more than half of the nurses would not document their nursing care plan.[20] A previous study did not find an association between the extent to which nursing staff felt supported by the electronic health records and the use of specific standardized terminologies.[21]

In this study, most of the respondents had a positive attitude toward electronic nursing documentation in the delivery of patient care. In the researcher's opinion, a positive attitude toward electronic nursing documentation can provide quality nursing care because it can easily prioritize patient care. Similar to findings from previous studies, most nurses have a positive attitude toward computerization.[22–25] Hafizah and Lee (2018) reported that Malaysian nurses had a positive attitude toward electronic nursing documentation.[5] Meanwhile,

positive attitudes are seen among nurses who have more experience with new technologies.[8,23] By contrast, Kahouei *et al*. (2014) reported that most of the nurses with negative attitudes also had a poor implementation of the electronic nursing documentation.[25] This situation was significantly associated with factors such as the inadequacy of documenting sheets, time, staff, and operational standard of nursing documentation and the lack of motivation.[7,18,26] They also suggested that employment institutions should provide training on electronic nursing documentation to improve nurses' knowledge and provide adequate documentation requirements to carry out nursing services.[9]

In this study, no significant association was found between knowledge of and attitude toward electronic nursing documentation. Additionally, sociodemographic factors such as age, education level, and working experience are not significantly associated with attitudes toward electronic nursing documentation. In other words, nurse's attitudes toward and knowledge of electronic documentation were not influenced by age, working experience, and education level. Thus, old age or high educational attainment does not necessarily indicate that nurses are more knowledgeable of safekeeping patient information in electronic records. These results are similar to those of previous studies that did not find a significant relationship between work experience and attitudes toward computers.[23–25]

According to Yontz *et al*. (2015), the education level of the respondents did not have a significant relationship with their attitudes toward electronic medical records.[24] Nurses reported that electronic documentation improves the quality of clinical documentation by preventing duplication and incomplete data entry.[26] Moreover, most nurses use computers nowadays. Indeed, computers appear to be a part of nursing activities, and electronic nursing documentation effectively enhances nurses' perception of electronic nursing documentation programs. However, permanent educational actions are needed to improve the incorporation and effective use of information technology in healthcare services and nursing in primary healthcare.

Electronic nursing documentation is an essential aspect of inpatient care and multidisciplinary communication.[27,28] Nursing staff felt that electronic health records aided them in performing nursing activities and provision of care.[3,29,30] In a previous study, nurses reported increased satisfaction in the usability of electronic nursing documentation.[21] By contrast, the nurse turnover had significantly increased from the pre-implementation to the post-implementation period and failed to return to the baseline level.[2] Moreover, incorporating electronic, evidenced-based practice tools into the bedside workflow of nurses promotes decision making at the point of care and thus may improve quality without negative effect on direct cost.[3,21]

The strength of this study is related to its analysis of the knowledge level of and attitude toward electronic nursing documentation, which will allow nurses to plan quality patient care. The findings of this study may help make evidence-based decisions to optimize the effectiveness of electronic documentation in the surgical and medical wards of a tertiary hospital. This study also had limitations as it uses a cross-sectional study design that appears to provide information about the situation but cannot explore the direction of a relationship of electronic nursing documentation. Thus, we cannot predict whether nurses with high knowledge levels will practice good documentation about patient care plans in the future. Therefore, the results of this study cannot be generalized to other nurses in Malaysia. For future research, a qualitative study is necessary to explore nurses' experiences in electronic nursing documentation. An intervention study was also recommended to evaluate the current electronic documentation.

CONCLUSIONS

This cross-sectional study was conducted to identify the knowledge of and practices toward electronic nursing documentation. This study showed that most nurses have a high knowledge level of and a positive attitude toward electronic nursing documentation. No significant relationship was found among sociodemographic factors, knowledge level of, and attitude toward electronic nursing documentation.

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CONFLICT OF INTEREST

None declared.

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