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Original

Differences in the level of students' achievement in the implementation of nursing procedures between two hospitals in which they are and are not granted the right of access to an electronic medical record system

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Abstract

Students underwent a training class, Basic Nursing Training II, at three health care institutions for two weeks (90 hours). Electronic medical record systems had been adopted by two of the institutions. Hospital A, one of the two system-adopting institutions, had issued individual students with IDs and passwords, and they had free access to the electronic medical record system. On the other hand, since Hospital B had not issued the students with IDs and passwords, they had no free access to the system and had to ask a nurse each time they needed to view the electronic medical record system. A comparison of the two institutions was conducted, revealing significant differences in the time required to collect information and achievement levels in the nursing training class.

Key words: electronic medical record system, access authority, implementation of nursing procedures, basic nursing training

1. Introduction

Many health care institutions in which nursing students undergo clinical training have introduced electronic medical chart systems, and it is essential for students to view medical charts during clinical training to obtain patient information.

Differences in nursing students level of to electronic medical record systems might affect their level of achievement.

A survey was conducted, involving students who had undergone "Basic Nursing Training II" and implemented nursing procedures for the first time in Hospitals A and B, in which they had and did not have free access to the system to view medical charts, respectively, to examine differences in their achievement levels in the implementation of nursing procedures.

2. Objective

To assess whether nursing students right of access to an electronic medical record system during training affects their level of achievement.

3. Methods

1) Subjects:

Clinical nursing practice was conducted in three hospitals. Two of these hospitals had adopted an electronic medical record system, and one hospital Maintained paper charts. The subjects were students engaged in clinical nursing practice in Hospitals A and B using an electronic medical record system in this study.

The subjects were 18 and 29 nursing college students who completed "Basic Nursing Training II" in Hospitals A and B, respectively. Hospital A

had given access to the students. But Hospital B had not. Both hospitals had adopted the "Fujitsu HOPE/EGMAIN-GX" electronic medical record system.

2) Survey period:

The survey period was between March 14 and 31, 2014.

3) Survey items (common to Hospitals A and B):

(1) Frequency of viewing electronic medical record system

Daily numbers of times viewing medical charts were reported by the students.

(2) Number of days required to collect information

The number of days required to collect information was based on students' subjective self-assessment.

(3) Achievement in the implementation of nursing procedures

The implementation of nursing procedures was self-assessed by the students in a subjective manner based on the following elements of the procedures: information collection, primary assessment, association charts, secondary assessment, nursing diagnosis, patient goals, and scores based on a four-grade scale to determine whether or not the goals stated in the nursing care plan had been accomplished: A (4 points): Definitely yes; B (3 points): Yes; C (2 points): No; and D (1 point): Definitely no.

4) Survey methods

An originally developed, self-completed questionnaire survey was conducted involving nursing students immediately after they had undergone basic nursing training.

Subjective self-assessment was conducted by the students.

5) Definition of terms

In the present study, "having the right of access" was defined as a situation in which individual students had been granted IDs and passwords so that they could freely view medical charts using any PC. "Having no right of access" referred to an environment in which students had not been granted IDs and passwords, and they had to ask a nurse to grant them access when they needed to view electronic medical record on a PC. The students were allowed to conduct the required procedures themselves after they had been logged into the account and then they logged out by themselves.

6) Analysis methods

The statistical software SPSS21.0 was used for analysis.

The frequency of viewing electronic medical charts (1) and number of days required for information collection (2) were determined using unpaired t-tests, and the level of the implementation of nursing care procedures (3) was analyzed using the Mann-Whitney U-test. The significance level was $p<0.05$.

4. Ethical considerations

The present study was conducted with the approval of the research ethics committee of the university. The students received written and oral explanations that: participation in the study must be based on their own free will, they had the right to withdraw from it at anytime, and they would never be treated in a disadvantaged manner because of it, in addition to the objectives of the study. The survey was implemented after receiving their written consent.

5. Results

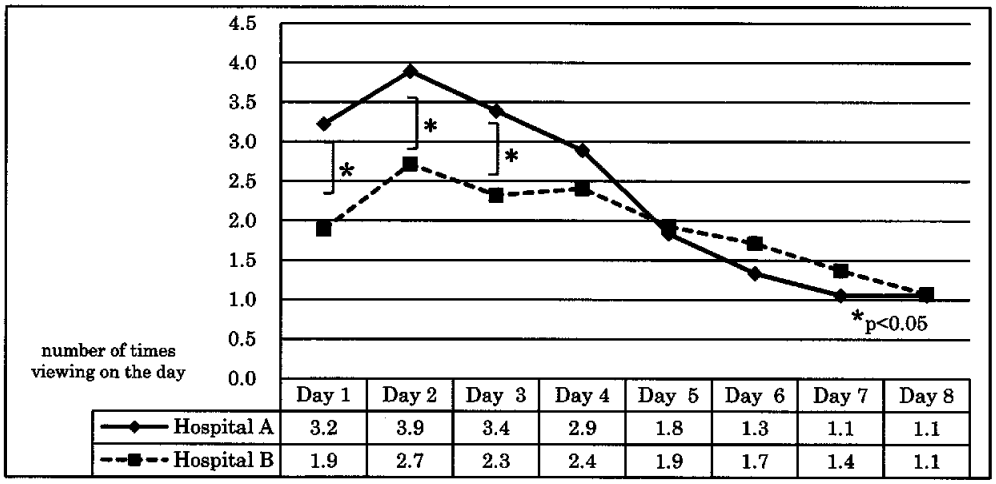
1) Number of times viewing electronic medical record system (Figure 1)

Mean number of daily views of electronic medical records.

The mean numbers of daily views of medical records throughout the training period in Hospitals A and B were 2.3 and 1.9, respectively.

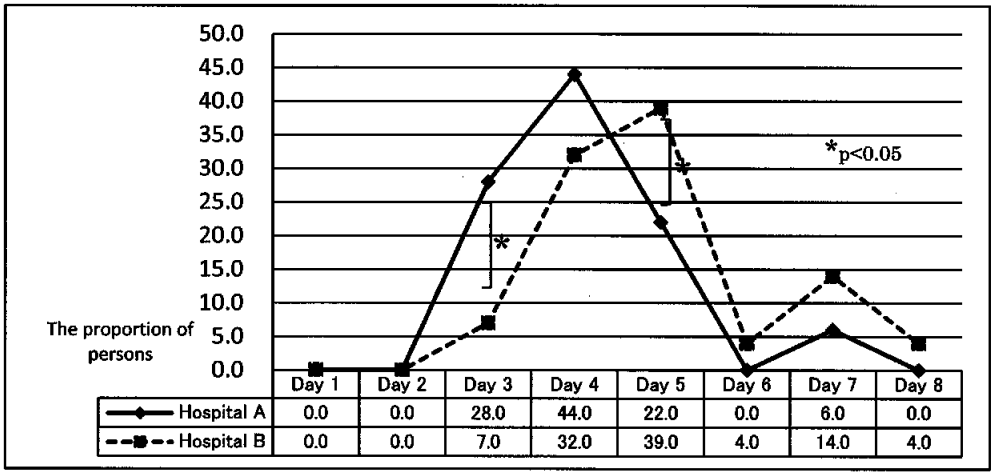
Regarding the frequencies on a daily basis, the numbers of times viewing medical charts on Days 1 and 2 in Hospital A were 3.2 and 3.9, respectively, whereas those on Days 1 and 2 in Hospital B were 1.9 and 2.7, respectively.

Or comparing the number of views in Hospitals A and B, the total number in Hospital A was significantly higher training day 1, day 2 was 3 days. The frequency of viewing electronic medical charts in Hospital A was higher than that in Hospital B, and there were significant differences in the frequencies during the three days. ($p<0.05$). In the second half of training, the students viewed electronic medical charts less frequently, and the frequency in Hospital A was lower than in Hospital B.



	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Hospital A	3.2	3.9	3.4	2.9	1.8	1.3	1.1	1.1
Hospital B	1.9	2.7	2.3	2.4	1.9	1.7	1.4	1.1

Figure 1 Frequency of viewing electronic medical record system (unit: frequency on 1 day)



	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Hospital A	0.0	0.0	28.0	44.0	22.0	0.0	6.0	0.0
Hospital B	0.0	0.0	7.0	32.0	39.0	4.0	14.0	4.0

Figure 2 The number of days required for information (unit: rate of successful information retrieval)

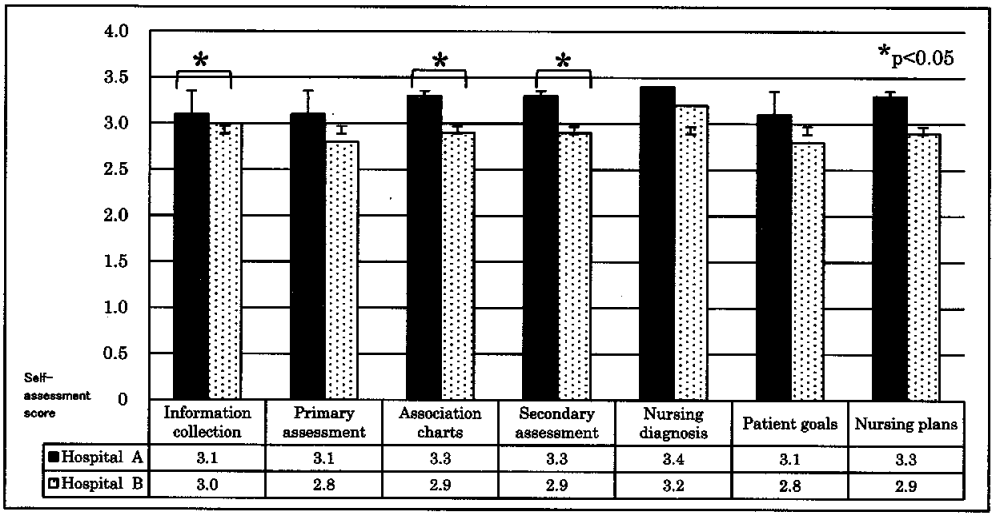
2) Number of days required to collect information (Figure 2)

Regarding the number of days required for information collection to implement nursing care procedures, 28% of the students in Hospital A stated that they had finished information collection by Day 3. The majority of the students in Hospital A finished it by Day 5: 44% by Day 4 and 22% by Day 5. In Hospital B, the entire training period was required for some students to collect information: 7, 32, 39, 4, 14, and 4 % by Days 3, 4, 5, 6, 7, and 8. There were significant differences on Days 3 and 5 between Hospitals A and B. The significance level was ($p<0.05$)

The numbers of days required to collect information on medical histories that had been input into electronic medical records in Hospitals A and B were 4.1 and 4.9 respectively. It took a shorter time to collect information on medical histories in the hospital that had granted the right of access Hospital A.

3) Levels of achievement related to different nursing procedures (Figure 3)

The levels of achievement in all items related to nursing procedures: information collection, primary assessment, related charts, secondary assessment, nursing diagnosis, patient goals, and nursing care plans, in Hospital A were higher than those in Hospital B. There were significant differences in the following items: "information collection", "related charts", and "secondary assessment" ($p<0.05$).



	Information collection	Primary assessment	Association charts	Secondary assessment	Nursing diagnosis	Patient goals	Nursing plans
■Hospital A	3.1	3.1	3.3	3.3	3.4	3.1	3.3
□Hospital B	3.0	2.8	2.9	2.9	3.2	2.8	2.9

Figure 3 Levels of achievement related to different nursing procedures (unit: points)

6. Discussion

Nursing training was conducted in two hospitals that had introduced electronic medical record systems from the same vendor. Students in Hospital A were able to view electronic medical records anytime using their IDs and passwords. On the other hand, students in Hospital B had to ask a nurse to input their IDs and passwords to log into the electronic medical record system when they needed to view medical records.

The frequency of viewing medical charts in Hospital A between Days 1 and 4 was higher than in Hospital B, and that between Days 5 and 8 was lower than in Hospital B (Figure 1) A study on the frequency of viewing electronic charts among students conducted by Yamashita et al. suggests that, when students are allowed to view electronic charts freely, two to three days are required for them to learn to operate the electronic medical chart system and, and the frequency will become higher over time. Yamashita et al. also suggest that the frequency of its usage by students will be high on Day 2 and low on Day 3 (Yamashita et al., 2014).This may have been because the students were able to freely view medical charts in Hospital A and had to obtain information on medical histories in the early stages of training in particular; in the second half of training, they viewed patient records less frequently because they were only required to acquire information on routine nursing care. However, it is not intended brute basic access log number to electronic medical records in this clinical training. Access number of electronic medical records it was consistent with previous studies that training Day 2 is reduced most then. The numbers of days required to collect information in Hospitals A and B were 4.1 and 4.9, respectively. The approximately one-day difference is considered to be a cause of the difference in the level of achievement in the implementation of nursing procedures. According to Nakayama's study, individual students for the purpose of the clarity of personal information handling are given an ID and password suggested that viewing environments should be prepared in which one or two students can use one PC terminal (excluding those for staff) anytime to freely collect information according to their own study plans (Nakayama et al., 2005). The present study did not examine the mean number of terminals available to students.

In order to achieve qualitative improvement, it has been stated that it is necessary to grant access rights to students.

Regarding differences in the achievement levels in different nursing procedures, the levels in all items were higher in Hospital A (Figure 3). Collection of information, essential for the implementation of nursing procedures, and the accuracy and speed of information collection greatly affect care. As are the benefits of granting access to the system to students, students of nursing procedures, then you can collect the information in the early stages of training, and apply it to the implementation of the procedure. It performs the electronic chart of operation education in universities in Niimi public university, And they are trained as to not disoriented in place of clinical training. Doi said. To build an electronic medical record education system as a new teaching materials, it was

examined challenges and effectiveness of education systems that utilize electronic medical record system on campus. Doi et al. conducted a survey on the usefulness of the introduction of an electronic medical chart system to universities and the implementation of education on its operation in advance, and suggested that "teaching the operation of the electronic medical chart system to students prior to clinical training effectively increased the level of the implementation of nursing care procedures and helped them prioritize problems related to nursing care" (Doi et al., 2008).

Many students who underwent training in Hospital B, a hospital that did not grant access rights, stated that they felt marked stress when they had to ask nurses to help them view medical charts while confirming that they were not busy or in a bad mood, and, therefore, psychological influences on students should also be considered. In their study, Furuya et al. suggested that, when students who have not been authorized to access electronic medical charts have to apply for their viewing, they feel a significant amount of stress (Furuya et al., 2004).

It is necessary to develop an environment in which students are granted the right of access to electronic medical chart systems and can view medical charts freely in order to utilize the system effectively as an information collection tool.

7. Conclusion

1) In the hospital that had granted students the right of access to the system, they viewed electronic medical charts more frequently and were able to obtain patient information more promptly.
2) In the hospital that had granted students the right of access to the system, their level of achievement in the implementation of nursing procedures was higher.

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