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A Basic Study On Application of Voice Recognition Technology to an Electronic Nursing Record System

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Abstract

Computerization of a nursing record has progressed in Japan. However, the present electronic nursing record system using the conventional keyboard operation has some problems such as the input time and operationability for common nurses. In this study, we have planned to introduce voice recognition technology to the system and conducted a basic study for application of the technology. In the present study, a template for a focus chart as a progress record was contrived for simple information entry and easy processing of the entered information. An input experiment for evaluation of the template with the voice input tool was made and it was suggested our method might be useful.

Keywords:

electronic nursing record system, voice recognition technology, information entry, template, focus chart

Introduction

Recently, computerization in the nursing field has been progressing and an electronic nursing record system is gradually introduced in Japan. However, it is not said the present system can increase the time for nursing patients, because information entry for the system must be made by keyboard operation with which a common nurse is not familiar. Therefore, we intended to apply voice recognition technology to the information entry so as to increase in time for nurses to touch patients and improve the quality of nursing by shortening the recording time for an electronic nursing record system. The purpose of this study is to conduct basic investigation for applying a voice recognition tool as substitution of keyboard aiming at construction of the system which is appropriate to the field of nursing practice.

Method

In case of utilizing a voice recognition tool for only input of free sentences like input by using a word processor, it is very difficult to process the entered information. Therefore, we contrived a template for the information entry of an electronic nursing record system by which not only reduction of the input time and improvement of operationability but also easy processing of the entered information can be realized. The object of information entry for the system is fundamental nursing information by using Gordon's health pattern, information of a progress record by using a focus chart of patients and time-dependent record. For the focus chart, we made the template for the "focus", "action" , "data" and "response" in which words and phrases necessary for nursing registered in advance should be uttered by using Dragon Naturally Speaking ™ as a voice input tool. These words and phrases are hierarchically selected from the registered lists and have a dynamic connection to each other. Then, by using the template for the focus chart, a voice input experiment by four nurses as subjects was conducted for proving its utility and the input time, operationability and exactness of the information entry was evaluated.

Result

As the template, we tried to make windows for data of entering a progress record and time dependent record and a list of progress records. Figure 1 shows an example of the window templates for a focus chart as a progress record which is composed of entry items of a focus, data, action, responses etc. An example of a window of focus name selection for a respiratory conditions of a patient is shown in Fig 2. Figure 3 shows an example of the list. We can retrieve items shown in the list.

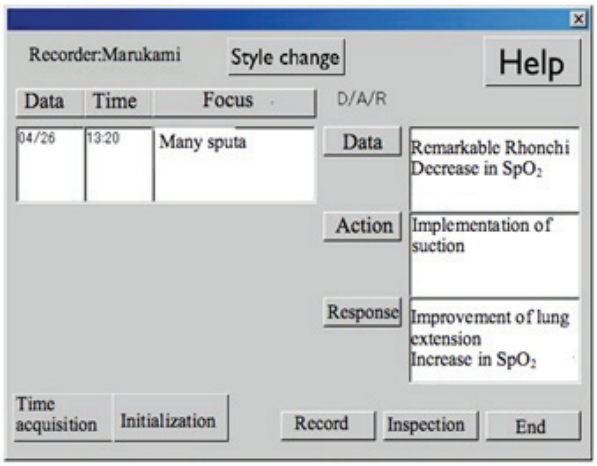

Figure 1 - Example of input screen of focus chart of voice input

We executed the afore-mentioned verification experiment by using the templates compared with keyboard input. The experiment revealed that the input time and operationability of the voice input was superior to the keyboard input although subjects who were nurses had no experience of the voice input. In addition, the misinput rate in the input of the free text part by the voice was 1.5% on the average and the misinput rate became 0% in the input of the selection part (Table1). Furthermore, it was clear that the words and phrases for the focus chart were exactly entered by using the template with the voice input tool.

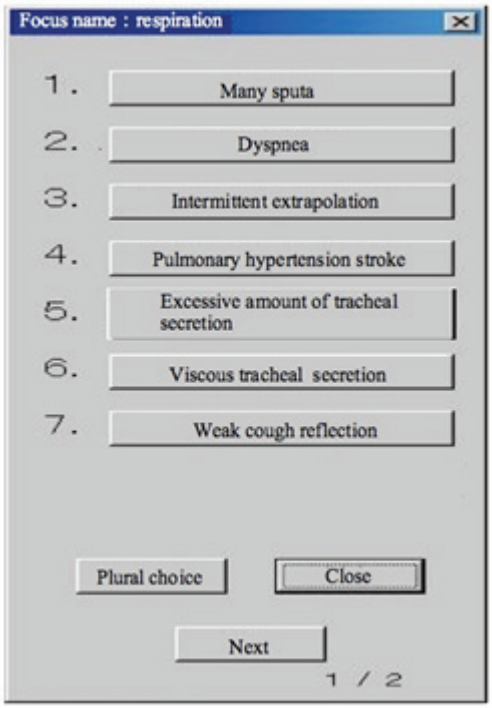

Figure 2 - Window of focus name selection of a respiratory cassification

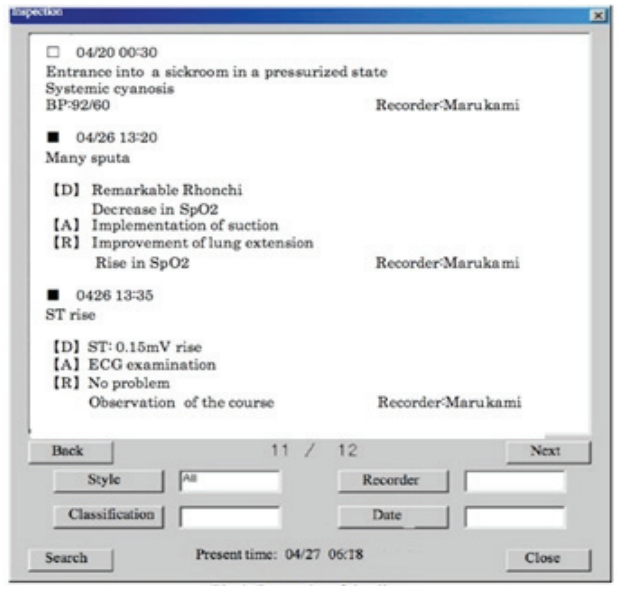

Figure 3 - Example of the list

Table 1- Result of the verification in experiment

Mis-input/Voice (Selective part)	Mis-input/Voice (Free input part)	Input time-Keyboard (Correction time is included)	Input time-Voice (Correction time is included)
0%	3%	520 sec.	155 sec.
0%	1.5%	899 sec.	197 sec.
0%	1%	294 sec.	204 sec.
0%	0.5%	500 sec.	122 sec.
average→ 0%	1.5%	533 sec.	170 sec.

Discussion and conclusion

From the experiment, it was suggested that the voice input using the template made by us was useful for information entry of the system. However, there is room for improvement of the operationability and exactness of the information entry concerning the template. In order to promote a voice input tool for an electronic nursing record system, it should be considered to use the tool together with the conventional keyboard input investigating the characteristics of the nursing field. Nevertheless, this study is thought to be significant, as it is the first trial of applying the voice recognition technology with the template to an electronic nursing record system.

Reference

[1] Yukio Kurihara. Actualization circumstance of the effect which is expected to the electronic chart conversion of

nursing record. Nursing, 2004. Vol56 No.14 ; pp. 63-68.(in Japanese)

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