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Expert system application for telehealthcare practice

Purpose

Expert systems have been widely used in clinical and healthcare practice for various purposes. However, few applications are found in telehealth domain[1] where violation of measurement compliance and the malfunction of hardware devices were also important issues, in addition to vital sign monitoring. This paper presents an expert system application for the largest commercialized telehealth practice in Taiwan conducted by Min-Sheng Healthcare. Since 2009, Min-Sheng Healthcare started to offer a telehealthcare service "Smart Care" for patients just discharged from the hospital, patients with chronic diseases, and elderly patients who have to visit the hospital frequently. Under the concept of creating a "Houspital", Smart Care strives to achieve the goal: "patients in their own Houses receive the same continuous care as if they are in the Hospital".

Method

Figure 1 shows the telehealthcare service platform of Smart Care. Patients measure vital signs according to the measurement prescription from their doctors. The main function of the expert system is to detect and classify events from the measurement data transmitted to the database at the call center. It contains 3 inference engines, a knowledgebase input by doctors and medical experts, and a database of vital signs, prescriptions and logs. When abnormal event is detected, the expert system assigns an emergent degree and alerts the nursing team in the call center to take actions, making

timely phone visits to the patients for counselling or to urge the patients to come back the hospital for further check-up.
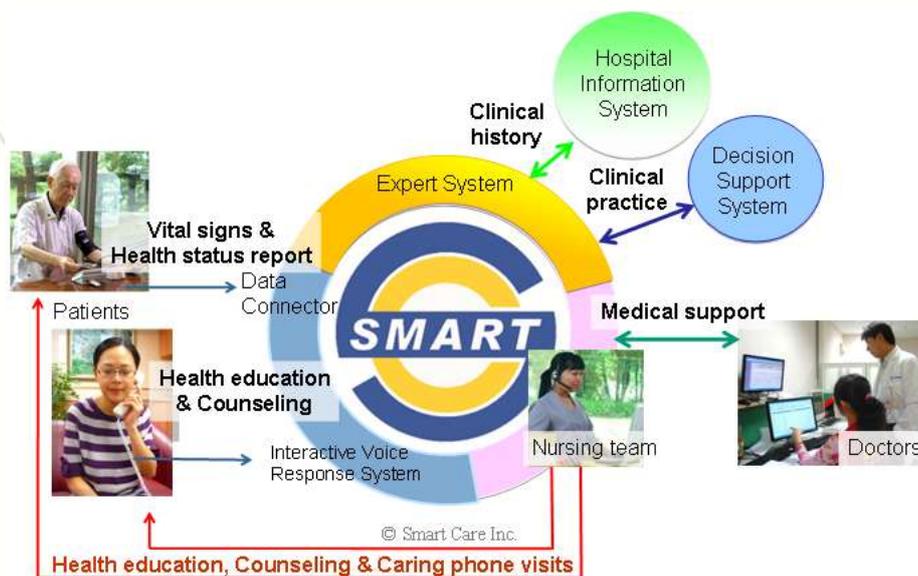

Figure 1. The telehealthcare service platform of Smart Care

Results & Discussion

Within two years of clinical practice, 19,182 patients were served by the expert system. The expert system detected 41,755 events in this period, including 22.9% abnormality of vital signs, 75.2% violation of measurement prescription, and 1.9% malfunction of devices. In average, the expert system saved 76.5% of the time required for the nursing team in the call center in judging the events. While the expert system helped to save cost and improve quality of the telehealthcare service, it is interesting to know that while 88.1% of the patients felt that phone visits and counselling are helpful, only 1.6% of the patients felt measuring and transmitting vital signs helpful. In this questionnaire result from 1,167 patients, even though 91.1% of the patients were satisfied with the Smart Care service, 96.0% did not want to pay for long term subscription of the service. Most people (76.3%) replied that they would rather go see a doctor than using the telehealthcare service.

*Keywords***:** Health & Self-esteem, telehealthcare, telehealth, expert system.

References

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