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Development of electronic home health care record system on web applications

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Abstract

The research aims to design and develop the electronic home health care record system (EHHCRS) via the web base application for supporting home health care (HHC) services. The system is created for 3 purposes, the hospital profile and task schedules, the electronic health record (EHR), and the back-office report. With the hospital profile and the decision support function, HHC team can easily set up and manage their resources on both staffs and budgets. The EHR function helps care takers to be able to retrieve, edit and modify patient records back and forth between the hospital databases. The reports such as reimbursement documents or surveillance are presented in the report module. The system is designed to operate both on-line and off-line conditions.

Keywords: Home health care; Electronic health record; Hospital information system.

1. Introduction

To achieve the better quality of health care, World Health Organization (WHO) suggests four health services: the continuum of care, the health promotion, the disease prevention, and the palliative care service. These services are recommended throughout the different care levels and sites because they do not only focus on patients in the hospitals, but in the communities also. As many countries have seriously faced health care crisis such as the rising of the health insurance coverage or the increasing of medical costs, the idea to provide the care providers and care

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prevention such as home health care (HHC) service at the primary level becomes a major role for health care services[1]. According to the WHO guideline, the HHC service is the continuum of care that combines the long term care into their category as one of their main targets due to the rapidly increases of the elder population that highly affects the national budget. The positive effects from better HHC services were shown in many studies such as benefits of home health care that increased a comfort, and reduced exposure to the hospital infection[2].

Reducing the hospital length of stay and decreasing readmissions when patients discharged to home that shown significantly reduced in readmissions from 205 (16.0%) to 54 (9.2%)[3]. The cohort study of 9,018 decedents in Ontario, Canada found that intensive home care services were associated with reduced risk of having a hospitalization or an emergency room visit[4]. However, even though the HHC service is quite effective for the patients with long term care, the HHC service itself is a subgroup of health care system that requires intensively collaborates between multidisciplinary teams and information retrieved from different care divisions to provide continuing cares. These electronic health record (EHR) results are shown in the survey report from many countries in Europe and Asia[5,6].

Similar to other countries, the long term care in Thailand became a serious concern as the population went toward to the senior society. The long term care model has been emphasized to support family caregivers and to engage effectiveness for a sustainable care at home. There are two models for an institutional long-term care, a low care model for elders who need only a social care with a minimal assistance and a high care for elders who continually need skilled nursing care. The demand and cost of services are increased proportionally to the amount of elderly visits. Ministry of Public Health (MOPH) responded this situation by developing an effective and sustainable HHC regulation as a countermeasure to support people who need a long-term care. However, the HHC protocol contains many different sub-modules in which paper-based documents are basically used, and thus it becomes very difficult and complicated to link and share the data.

Information technology (IT) becomes an important role to support health care providers and changes the way of medical treatments (i.e. health applications or biotelemetry). Therefore, it should be better for both patients and HHC teams to take benefits from using IT such as recording patient data at the point of care, managing work flows, and organizing teams. This Electronic Home Health Care Record System (EHHCRS) aims to solve the problem above, and to help operating teams with treatment protocols and medical records in hand.

2. Methodology

The EHHCRS is an electronic health dataset designed by using web-based application to connect a care provider team in the community area to the data center at Ramathibodi hospital. The main idea is to design a system that could work both on-line and off-line. It represents Home Health Care Data (HHCD) system that retrieves or records patient data from or to subsystem such as the laboratory information system (LIS) and the referral system. It was also aimed to replace the paper-based forms with new electronic record forms for the community health care team. All HHCD dataset of patients in HHC nursing service were designed following the HHC's process and data flow from Ramathibodi hospital. All details were collected from the patient's record at the Home Health Care Nursing Service (HHCNS) unit from years 2010 till 2014 using the SPSS program. The whole existing flow was analyzed in order to verify the problems and gaps between each process, and also between each subsystem. Moreover all dataset, data forms, and data flow diagram from all stakeholders were reevaluated in order to determine the connection between the data recorded in their processes. Forms and dataset required for each care division were carefully compared, especially non-electronic data since HHC records are mostly in a paper-based format.

All paper-based forms for stakeholder units, especially primary care level and community hospital were reorganized and redesigned. The current HHCNS has 4 processes: discharge planning, telephone follow up (F/U), home visit (HV) and referral. The existing flow started from referring patient to HHC until it ended with discharging from HHC by home health care primary nurse. The records were divided into 3 categories, nursing service data, patient data, and report data. First is the nursing service data such as home care discharge record, telephone follow up record, home visit record, pain assessment record, pressure ulcer record, etc. The second part contains the patient data such as home care admission record including personal information, history of illness and treatment, home medical prosthesis device and equipment, map record and self-care assessment. Finally, it is the report data such as summary record, and registration record. As there are many different dataset with different formats from operational