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Reduction of Overwork Time of Nurses by Innovation of Nursing Records Using Structured Clinical Knowledge

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Abstract

Hospitalization expenses account for a high rate of national medical care expenditure in Japan. The Japanese national medical care expenditure was 42 trillion 364.4 billion yen in 2015, in which hospitalization expenses were 15 trillion 575.2 billion yen (36. 8%). Therefore, it is necessary to take measures to reduce hospitalization expenses. The total ratio of the labor cost of physicians and nurses accounted for about 1/3 of all expenditures of general hospitals in 2015. Moreover, the personnel cost of nurses accounted for about 1/5 of all expenditure, showing that the personnel cost of nurses is an element with a large influence on hospital management. The objective of this study was to develop a methodology to reduce the overtime work of nurses accounting for a large rate of personnel expenses by focusing on overtime work, a personnel expense-increasing factor, aiming at hospital cost reduction. First, the cause of overtime work, planning, and recording by nurses were analyzed and an IT application increasing the quality and efficiency of the work was developed. Then, fees for the use and maintenance of the IT system meeting the following conditions were set as a strategy to introduce the system: (1) 50% reduction of the overtime work of nurses and (2) fees 50% or lower than the reduced payment for overtime work. This IT application was introduced to the heads and directors of nursing of 5 hospitals and the strategy was proposed. All heads and directors highly evaluated the system and responded to initiate the process for the introduction. It was suggested that the methodology to reduce the overtime work of nurses proposed by this study is useful and feasible.

Keywords:
Hospitalization, Health expenditures

Introduction

Problems with health care are discussed from viewpoints of safety, quality (in a narrow sense), and cost, and all advanced countries have immense tasks in each issue. Aging spurs an increase in national medical care expenditure to which advanced countries inject large public finance.

In Japan, hospitalization accounts for a high proportion of national medical care expenditure. The national medical care expenditure in Japan was 42 trillion 364.4 billion yen in 2015, in which hospitalization expenses was 15 trillion 575.2 billion yen (36. 8%) [1]. Therefore, it is necessary to take measures to reduce hospitalization expenses, which account for 36.8% of the total medical expenses. For 'reduction of the hospitalization expenses' in medical care, which is an important socio-technology to be possessed by a country, it is necessary to aim at 'improvement of efficiency while securing quality', i.e., improvement of added values for customers while optimizing devoted resources.

Table 1 Ratios of personnel expenses in general hospitals in Japan [3]

	Medical corporation	Local government	Former social insurance-related organization
Ratio of personnel expenses (%)	53.3	63.1	51.8
Ratio of personnel expenses for physicians (%)	13.8	14.2	15.9
Ratio of personnel expenses for nurses (%)	17.7	22.2	18.6
Ratio of personnel expenses for physicians and nurses (%)	31.5	36.4	34.5
Ratio of personnel expenses for others (%)	21.8	26.7	17.3

In data analysis of 773 general hospitals (2015 account settlement) [2], the numbers of workers per 100 patients were 9.9 full-time physicians, 2.4 part-time physicians, 65.7 nurses, and 52.7 other workers. Regarding the rate of cost to the medical revenue, the ratio of personnel expenses was 52.4%. The annual medical revenue per worker was 11,953,000 yen

(about 12 million yen) and the personnel expenses per worker were 6,267,000 yen.

On the other hand, in data analysis of 520 sanatorium-type hospitals (2015 account settlement) [2], the numbers of full-time and part-time physicians, nurses, and other works were 3.3, 1.7, 59.4, and 39.9, respectively. The proportion of personnel expenses was 58.5%, the annual medical revenue per worker was 8,999,000 yen (about 9 million), and the personnel expenses per worker was 5,266,000 yen.

Regarding the personnel expenses of general hospitals by hospitals established in 2015[3] are categorized as follows: 1) medical corporation, 2) local government, and 3) former social insurance-related organization, the overall ratio of personnel expenses was: 1) 53.3%, 2) 63.1%, 3) 51.8%, the ratio of personnel expenses for physicians was: 1) 13.8%, 2) 14.2%, 3) 15.9%), and the ratio of personnel expenses for nurses was: 1) 17.7%, 2) 22.2%, 3) 18.6%, showing that the total ratio of the labor cost of physicians and nurses accounts for about 1/3 of all expenditures. In addition, about 1/5 of all expenditures is the personal cost of nurses, showing that the personnel cost of nurses is an element with a large influence on hospital management.

To realize high-quality excellent services, 'co-creation' [4] by customers and service providers is attracting attention, i.e., greater importance is attached to designing for points of contacting customers. For hospitals, it is necessary to focus on ways of working of physicians and nurses who have many important contact points with patients. Their abilities and numbers influence the operational efficiency of elements other than the humans described above. Therefore, 'the ratios of personnel expenses for physicians and nurses' and 'way of working to create value' may be important.

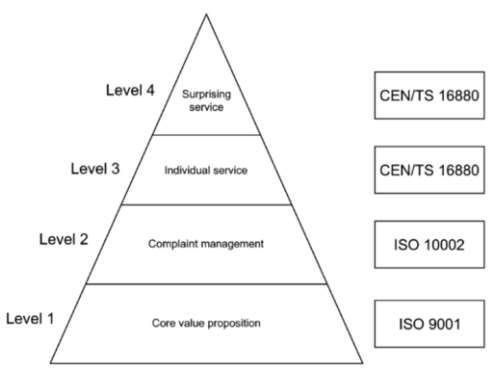

Fig. 1 Service excellence pyramid [4]

This study aims at developing a management method to reduce the hospital cost for the latter. Focusing on a personnel cost-increasing factor, overtime work, reduction of overtime work of nurses, which accounts for a large ratio of personnel expenses, is targeted. In the present study, we proposed the design of digitalization as an innovation of nursing records and investigated its usefulness and feasibility aiming at solving the problem with overtime work in health care.

Methods

We took the following steps for the purpose of a high-quality nurse's record and reduction of the overtime work.

Step1:

We suggested the rate of recording nursing observation of patient condition necessary to deal with individual patients does not reach 50% through a survey to evaluate the quality of nursing records in the current state. Failures of its inclusion in the planning, implementation, and recording have been identified as causes and 'volatizing situation' was suggested [5-7]. Moreover, it was clarified that data production and input depend on individual nurses and many documents are descriptive electronic records, being a long way from re-utilization.

Step2:

To solve failure to include it in a plan, preparation and utilization of many high-quality models of treatment and nursing care plans are useful. Thus, we have developed clinical knowledge content by incorporating NursingNAVI™ (Navigator for Thinking Process in Nursing) into PCAPS™ (Patient Condition Adaptive Path System) as a structured clinical knowledge content [8-12]. In the process of this development, using the Standard Terminology for Nursing Observation and Action (Ministry of Health, Labour Standards since 2016) for electronic medical records, the content of structured nursing care plan was developed.

Step3:

The result of two hospitals carried out record reform for problem-solving was shown five hospitals.

Case1: An acute hospital

A system application to support recording the structured nursing care plan was designed and implemented in a large-scale acute-care hospital with 1,000 beds. The proportion of nurses who took 30 minutes or more to identify the condition of patients in whom they were in charge of decreased from 45.4 to 5% after 3 months. It was suggested that utilization of the high-quality structured nursing care plan, which is clinical nursing knowledge, supports the thinking process of nurses and shortens the work time. After 3 years, 40% of patients applied clinical path, 60% of patients applied NursingNAVI®. It became zero in the overtime for records. The overtime work markedly decreased in the hospital and overtime work for recording was mostly resolved.

Case2: A non-acute hospital

We analyzed the nurse's record. Physicians satisfied the nursing record of observation. Only the PCAPS introduction ward was able to maintain a decrease of the overtimes.

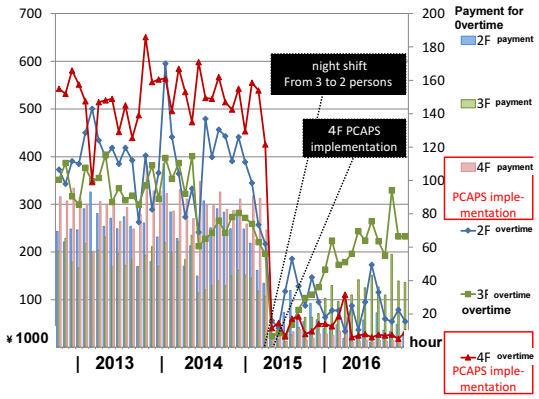

Fig. 2 Overtime and the payment every month

Step4:

These five hospitals carried out follows two surveys. The aim of Survey 1 is to remark the problem of quality of nursing record using our survey sheet[7]. It is set elements of nursing observation in the acute phase after colectomy. We used the 'Master File of Standardized Nursing Practice Terminology'. It is standard terminology for nursing practice by the Ministry of Health, Labour and Welfare in Japan. The set of elements was developed after reviews using the framework of NursingNAVI® [6-8] by multiple clinical nursing specialists. The availability of the survey sheet was verified by comparing surveys among four and fifteen hospitals. The aim of Survey 2 is to remark the problem of the overtime work. It was conducted in each hospital. We prepared output-table of each month and each nursing unit. Senior nursing officers of five hospitals gathered data in each hospital, and input the output-table sum of overtime and sum of overtime payment.

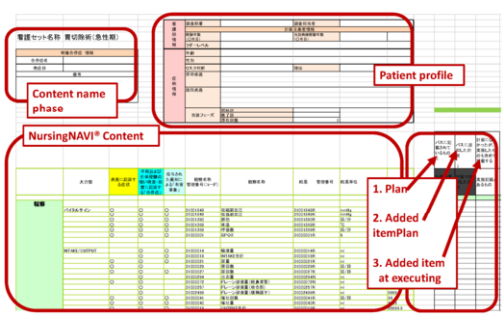

Fig. 3 Survey 1: Surve sheet of nursing documents using NursingNAVI® Content for quality evaluation of nursing observation

Results

Survey 1: Quality of nursing record using our survey sheet

Vital signs, in/out, was relatively recorded, but the observation to affect the monitoring of a symptom, complications of the disease was less than 50%. A certain hospital investigated record time and the number of record letters using log data of HIS. As a result, we understood that they recorded it until the night after daily service duties of 2 change were over. In addition, the actual situation that wrote an enormous amount of description record became clear.

Survey 2: the overtime work

Each hospital surveyed the payment amount and time of overtime work by month and ward for one year. The annual payment was 20-90 million yen in acute-care general hospitals with about 400 beds, 150 million yen in acute-care general hospitals with about 490 beds and 250 million yen or more in university hospitals with about 1,000 beds. In contrast, the payment for overtime work in the large-scale hospital with 1,000 beds described above which introduced the support system for the structured nursing care plan recording was about 25 million yen, confirming that recording work necessary for medical treatment is performed in overtime work.

Five hospitals started activity for the innovation of the nursing record system after having confirmed the results of this investigation.

Discussion

Standardized care plan using structured nursing knowledge is effective and efficient for nursing practice. Nurses can observe systematically using the structure. They can gather data and information for analyzing own nursing. We could introduce NursingNAVI® and PCAPS in the hospital information system. It was suggested that hospital nursing can use two types of systems as structured nursing knowledge.

Even though an excellent system is designed and developed an actual practice sites request its introduction, if the contribution to management cannot be claimed, the realization is difficult. For a strategy to introduce the system, we investigated a business model (1) targeting 50% reduction of overtime work time of nurses and (2) setting fees for the use and maintenance of the system and content at 50% or lower of the reduced payment for overtime work.

It is possible to set a business model in which this system can be introduced into acute care hospitals with 400 beds paying 20 million yen for overtime work a year, which is a relatively small payment, and the hospital income can be increased. For large-scale acute care hospitals, contribution to management increases because the payment for overtime work is high.

Hospitals introducing the system are requested to provide information on 'overtime work time of nurses and payment for it in each ward' as Key Performance Indicators (KPI), and changes in improvement are presented as numerical values.

Conclusions

This strategy and scenario were provided to nursing administrators and hospital administrators of five hospitals, and all hospitals responded to initiate the process for introduction, suggesting that the strategy proposed by this study is highly feasible.

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