THE DEVELOPMENT OF WEB-BASED CHRONIC DISEASE MONITORING MANAGEMENT ACCORDING TO COMPLETENESS ASPECT OF *CLINICAL DOCUMENTATION IMPROVEMENT* (CDI)

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Abstract. Chronic Disease Management Program or *PROLANIS* is one of programs implemented by BPJS (The Indonesian National Health Insurance System). It is intended for BPJS chronic diseases members to reach the optimal quality of life and prevent disease complication.[1]. *Clinical Documentation Improvement* (CDI) is a program facilitating the completeteness of patient's clinical status. [2]. Complete documentation is required for the continuation of complete health service to patients with chronic diseases. The transition from manual to electronic-based clinical documentation was strongly recommended as it improved the completeness of information.[3]. Documenting *Prolanis* patients' health status was less related to CDI, the design and implementation of web-based monitoring application was expected to become solution of existing problem. An analysis should be conducted especially on completeness aspect to make the application perfect. This research was quantitative analytic descriptive research with *cross sectional* approach by using scoring method on completeness aspect of information quality. The results showed the highest completeness aspect of patients' data item was 82.5% and the lowest completeness aspect of menu data item was 70%, followed by 70.8% of allergic history item. The research' results are expected to provide guidance in improving the application especially to support CDI.

1. INTRODUCTION

Chronic Disease Management Program (*PROLANIS*) refers to one of programs carried out by Healthcare BPJS (The Indonesian National Health Insurance System). It is a health service system with proactive approach which is implemented in integrated way and involves Participants, Primary Health Care Facility (FKTP) and Healthcare BPJS. Prolanis sets a goal to maintain the health of BPJS participants suffering from chronic disease so that they are able to achieve the optimal quality of life under the effective and efficient costs as well as prevent any disease complications.[1]. Prolanis activities involves medical or educational consultation, *home visi*t, *reminder*, club activity and periodically health-status monitoring.

Complete documentation is required for the continuation of health service to support plenary service to patients diagnosed with chronic diseases. Clinical Documentation Improvement (CDI) is defined as a program facilitating the realization of accuracy on patients' clinical status in which it will be converted to code data. Code data will be translated into qualified reports, medical report cards, the data needs for financing, the data of public health, disease reporting and register [2]. The transition of from manual to electronic-based clinical documentation system is highly recommended as it is able to improve the completeness of information medical personnel's satisfaction. [3]

Sakinah Clinic in Kaliurang, Jember is one of FKTPs that has been working with BPJS regarding *Prolanis* since 2014. *Prolanis* activities that are frequently done once a month include the calculation

of weight, height, blood pressure, checking the blood sugar, medical consultation and doing exercises. The patients of *Prolanis* at Sakinah Clinic are as many as 27 patients, 55,5% of them are patients with hypertension, 44,4% are patients with diabetes mellitus, and 70,3 % of patients has high nutritional status.

Documenting the complete health status of *prolanis* patients through ongoing examination requires monitoring and evaluation activities in which patients and medical personnel are easy to access it, including the information on the conditions of fat profile, blood sugar profile and nutritional status. The existence of accessible-complete information is expected to motivate patients more in controlling their health status. Moreover, compiling the data of routine report to Healthcare BPJS regarding *prolanis* activities is easier to do if it is assisted by an electronic application. The design and implementation of routine web-based monitoring application for *prolanis* patients are needed as a solution to this existing problem. However, an analysis of information quality was conducted especially on completeness aspect related to the application itself to make it perfect and was appropriate for the needs, especially on CDI.

2. LITERATURE REVIEW

Chronic Disease Management Program (*PROLANIS*) is defined as a health service system with proactive approach which is implemented in integrated way and involves Participants, health care facilities and Healthcare BPJS whose objective is to maintain the health of BPJS participants suffering from chronic diseases so that they are able to achieve the optimal quality of life under the effective and efficient health service costs. The chronic diseases mentioned above are Hypertension and Diabetes Mellitus.

Clinical Documentation Improvement (CDI) is a program that facilitates the realization of accuracy on the patient's clinical status in which it will be changed to code data. Code data will be translated into qualified report, medical report cards, the data needs of financing, the data of public health, disease reporting and register. [2] In Indonesia, this clinical documentation is known as medical record.

Medical record according to Constitution of Republic of Indonesia Number 29/2004 is a file containing records and documents about identity, examination, treatment, medication/therapy, and other services that have been provided to patients. The purpose of this medical record is divided into two covering primary goal and secondary goal; the one which is most directly related to patient health service is primary. Medical record is related to patient healthcare service. [4]

The quality of information is a function which involves the output of information produced by the system. In accordance with some statements proposed by experts, it can be concluded that the quality of information is a measurement which focuses on the output produced by the system, as well as the value of the output for the users. [5] The information quality also contains the completeness and user satisfaction. [6]. The completeness is in the form of contents taken from the information system. Information can be said complete if it includes all information needed by the users of the information system. The information system itself is a system within organization which meets the needs of daily transaction processing, supports the operations, becomes managerial and strategic activities of the organization and provides certain external parties with necessary reports. [7]

3. METHOD

The type of this research was descriptive and quantitative analytic research with cross sectional approach. Cross sectional refers to research design in which its measurement is carried out at the same time or once. Descriptive research was used to present the data systematically so that it became understandable. *Likert* scale was used as quantitative analysis to support this research by determining the value of each variable.

24 out of 30 people were chosen as the samples through cross sectional formula in which they are associated with the application of web-based chronic disease monitoring management program.

Moreover, the sampling technique used was *systematic random sampling*. *Systematic random sampling* is a random sampling technique with certain interval of sequential framework.

This research used questionnaire consisting of question items about the quality of information from the application used. The instrument compiled was the questionnaire that had been tested for its validity and reliability through Pearson Product Moment Correlation test. This research was conducted in 3 months, from June 2019 to August 2019 at one of primary service facilities which managed the patients of BPJS *prolanis* in Jember regency. The validity and reliability test of the instrument was carried out at *prolanis* clinic in which its characteristics resembled a similar primary health care facility managing the patients of BPJS *prolanis* in Jember regency. The data collection used was through the post-application of web-based chronic disease monitoring management program that was conducted periodically. The data calculations carried out in this research were as follows:

(a) *Editing:* The process of editing data was done during the data collection. This editing aimed at checking whether or not there was incomplete data or errors while filling out the questionnaire.

(b) *Coding:* The process of giving symbols or codes for each data in each category contained in the questionnaire.

(c) *Entry:* Data entry was the process of entering data into a data processing application, *Microsoft Excel* was used in this research, it was performed after the coding process was done on each question of the questionnaire.

(d) *Tabulating:* Tabulation was carried out as a process of placing the data on tabular form (on table). The table was concisely made and contained the data concerning the researcher's need for analysis. The data analysis technique through scoring method covered each variable contained in the aspect of completeness on information quality which was measured through the question items on the questionnaire given to respondents..

4. RESULTS

The measurement results on the completeness aspect of information quality (shown on figure 1) obtained 82.5% as the highest patients' data item and the lowest menu data item on application was 70%. The data item of patients covered BPJS number, name, gender, Pisa (Person in charge of husband and wife), address, date of birth, telephone, date of entry, diagnosis, ICD code, username and password. Patients' data was needed by the clinic related to chronic disease management service as well as for the data recapitulation to report to Healthcare BPJS as the provider of national health insurance.
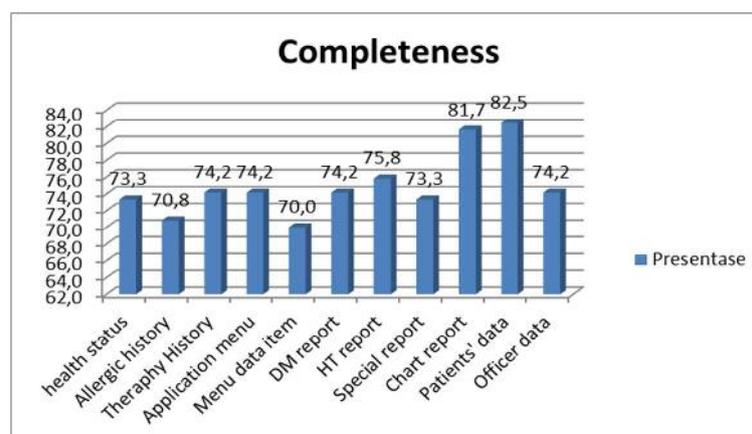

Figure1. The Percentage of Measurement Result on Completeness Variable

The measurement results of menu data item on application according to the completeness aspect revealed that the information had low quality compared to other aspects since there were only two

menu presented on the application menu consisting the patients with diabetes mellitus and hypertension. The research respondents as the users expected *prolanis* application was capable in providing the complete data item and improving its menu regarding the diagnoses of other chronic diseases. Meanwhile, the measurement result of allergic history was also lower than the other items of completeness aspect; it occurred as the patients did not need any allergic information on their *prolanis* application, but it played an important role for medical personnel in providing the services to patients. In addition, not all types of drug therapy/pharmacotherapy could be given to patients with allergic history to certain substances, so that it became essential information in supporting the success of medical service. The summary of items on the completeness aspect concerning quality information on *prolanis* application is presented on the following table:

Table 1. The Item of Completeness Aspect on Information Quality

The Items of Completeness Aspect	Item	Percentage
The application presents the patient's health status (IMT, blood pressure, blood sugar level, cholesterol) completely	Health status	73,3
The application contains information related to the patient's allergic history	Allergic history	70,8
The application contains information related to patient's treatnent history	Therapy history	74,2
Complete menu is provided on prolanis application	Application Menu	74,2
Prolanis application provides complete data items	Menu Data Item	70,0
Producing a routine monitoring report of DM patient completely	DM Report	74,2
Producing the result of routine monitoring report of Hypertension patient completely	HT report	75,8
Producing special reports (GDP, GDPP,GDS) of DM disease completely	Special report	73,3
Producing health-status monitoring chart (nutritional status, blood pressure, blood sugar level, cholesterol) completely	Chart Status	81,7
Producing the data of patient (name, BPJS number, gender, PISA, address, date of birth, age, telephone, date of entry) completely	Patient Data	82,5
Producing the data of personnel (name, address, telephone, gender, position) completely	Personnel Data	74,2

Furthermore, the results of respondents' answers (described on Figure 2) as the application users concerning the completeness variable aspect on information quality showed that most of them agreed as much as 152 (57,5 %) of the total answers to question items. As many as 6 statements (2,27 %) tended to strongly disagree, it can be concluded that the majority of completeness aspect on information quality through *prolanis* application was fulfilled.
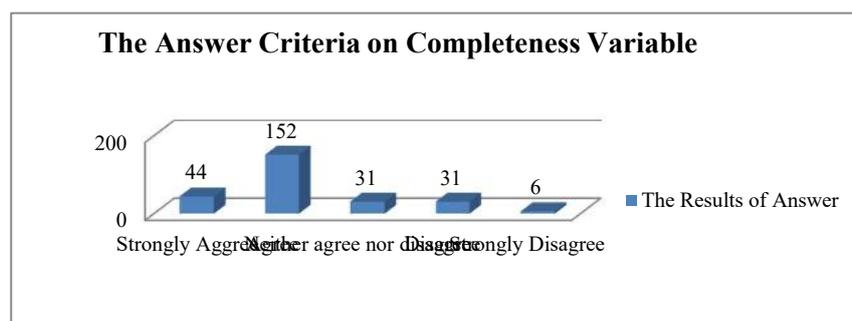
Figure 2. The Answer Criteria Completeness Variable

The results of score obtained from the question items related to the completeness aspect of information quality on *prolanis* application were multiplied by the total number of answers from question items, then 989 was obtained as the result; thus the score interpretation was obtained through the calculation based on the ideal score as follows:

The Calculation of Ideal Score

The total of Ideal Score :	The Highest Score X	$\sum$n X	$\sum$ Question Items
:	5 X	24 X	11
:	1320		

The Calculation of Score Interpretation

Score Interpretation: $\dfrac{\text{The Total Number of Score}}{\text{Ideal Score}}$ X 100%

: $\dfrac{989 \text{ total number of score}}{1320}$ X 100%

: 74,9 %

In accordance to the above calculation, the score interpretation obtained on the completeness variable was 74.9%. It showed that 74.9% was categorized to "good based on the following table of score interpretation:

Table 2. *Interpretation of Evaluation Score*

Percentage	Criteria
0%-20%	Very Poor
21%-40%	Poor
41%-60%	Fair
61%-80%	Good
81%-100%	Excellent

Source: Riduwan and Sunarto, 2011, *Pengantar Statistika* pg. 23[8]

Completeness variable was categorized as "good" since they were able to display the chart of nutritional status, blood pressure and blood sugar level of *prolanis* patients. The benefits of graph were to show clear and understandable facts. [9]. The chart presented on *prolanis* monitoring application was not only accessible to doctors, nurses and administrators but also the patients concerned. Hence, the health service providers and recipients, in this case were the patients got the information related to their health status by monitoring the chart of nutritional status, blood pressure and blood sugar level periodically. Another great benefit was the information related to patient health status was easier to access by monitoring the chart of nutritional status, blood pressure and blood sugar level periodically, patients are expected to be independent if their health status is under normal category. Besides, through *prolanis* monitoring application, patients will be able to put effort in maintaining their good health status and preventing the possibility of poor health status that might be occurred.

The completeness of data was able to support CDI program to improve data quality in a health information system. [10] A good implementation of CDI impacted patient health care directly by providing information for various parties covering the service providers and recipients (patients) so that it was capable in producing the quality information related to trends and disease history, public health, reporting, translating the code data and appropriate reimbursement. [11]. *Prolanis* monitoring application that had been designed was able to provide information to service providers and recipients (patients) through the development graph of nutritional status, blood pressure and blood sugar level periodically, so that the trends and history of health status periodically on each month were known.

The score interpretation results of data item variable on the completeness aspect of information quality obtained the lowest results compared to others. It happened as there were incomplete features found in Prolanis monitoring application. This incompleteness of feature was shown in one of the graphic features, in which there was no normal range found on the examination results. Other problem faced was *Prolanis* application did not include the result of uric acid examination so that they were not able to compile the entire examination results completely. The incompleteness of features caused incomplete documentation of examination history for *prolanis* patients. The system created should be able to compile all information properly and completely in accordance with a computerized-technology as a communication medium which accelerated the working process done by human; it involved the data entry, data processing until it became complete and accurate information and reporting. [12]

5. CONCLUSION

Complete documentation is strongly needed for the continuation of health services to support plenary services for patients suffering from chronic diseases. The analysis result of information quality especially on the completeness aspects related to *prolanis* application obtained overall score interpretation at good category (74.9%). The highest completeness aspect item was 82.5% related to patient data item, the lowest was 70% related to menu data item on application, and 70.8% related to allergic history item. The analysis result is intended to make *prolanis* application even more perfect so that it will meet the requirement that is appropriate to the needs of CDI.

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