DIGITALIZATION OF OCCUPATIONAL HEALTH MANAGEMENT THROUGH ELECTRONIC MEDICAL RECORD IN COMPLEMENTARY THERAPY

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Abstract. *The problems that have been present in occupational health management at the health complementary therapy center was the use of medical records. The therapists wrote down the details of the patients only on the piece of paper without any standard. When the regulation (Peraturan Menteri Kesehatan Nomor 15 tahun 2018) was released, the breakthrough started. Supported by a paperless system, medical information of the patients is now recorded on the electronic files.This study aimed to analyze the differences in the completeness data before and after the use of an electronic medical record at the complementary therapy centers. This research was conducted with a quantitative approach and cross sectional research design using the Mann Whitney test. The statistical test results of the p-value 0,000 <0,005 indicate that there are differences in the completeness between paper-based and paperless systems. In administrative data, there was an increase in completeness of 5.3% in terms of patients occupational information . In clinical data, there was an increase in completeness of 6.8% in terms of health problems. As a conclusion, it can be expected that the future integrated occupational health management in the complementary therapy can be made through electronic medical record.*

Keywords: *Complementary Therapy; Electronic Medical Record; Occupational Health*

1. INTRODUCTION

The demand of health complementary therapy is growing as patients seek alternative ways over their health and well-being. For millions of people, especially those living in remote and rural areas, complementary therapy offers acceptable, available, and affordable care. Unfortunately, the service of health complementary therapy centers are often not balanced with a good occupational health and safety management system (SMK3) in accordance with the requirements set by the Ministry of Health of the Republic of Indonesia. According to Regulation (Peraturan Menteri Kesehatan No.15 of 2018)concerning complementary - alternative medicines, recording and reporting are mandatory for health workers of health complementary therapy facilities. The medical record includes administrative data and patient clinical data. Health record documents contain administrative data and clinical data. Generally, administrative data is identification data that can be linked to patients while clinical data is interpreted as examination results data related to health.

The existence of integrated medical record recording in complementary medicine facilities is certainly also useful for therapists in complementary health care facilities in order to control the spread of a disease through checking patient data in the medical record. The completeness of patient medical records in complementary medicine facilities is very beneficial, especially during a pandemic outbreak that limits contact between therapists and patients, for example during an pandemic covid-19 outbreak. In addition to being useful for patients and therapists, the completeness of medical record files in complementary medicine facilities also has a major role in the implementation of the Occupational Health and Safety Management System (SMK3) where administrative control is one of the five risk control hierarchies based on ISO 45001, namely elimination, substitution, engineering, administration and personal protective equipment (PPE).

Prior to the COVID-19 pandemic, patient visit reports at complementary medicine facilities were incomplete because they were only written manually on paper and were not

guided by regulations.

Based on visit data from the previous research conducted by the researcher in 2018 (one year before the COVID-19 outbreak), the visit report was only filled in 20% of the total. This means that 80% of the completeness of the report is not filled in. Based on previous research related to medical records conducted by researchers, the contents of patient medical record files are beneficial for both employees and companies. For employees, the health information on the medical record that shows what diseases are most often suffered by patients so that employees can take appropriate prevention efforts for occupational diseases. For the company's management, patient health information is useful in the preparation of health programs through disease trends, the most complaints, and therapies most often chosen by patients.

Continuing previous research related to the completeness of medical records in employee occupational health programs and as a follow-up to the results of preliminary studies conducted by researchers and the results of published author research related to the health and economic impacts of the COVID-19 pandemic for therapists, so that researcher is interested in conducting research on "Digitalization of occupational health management through electronic medical records in complementary therapies"

2. LITERATURE REVIEW

2.1. Medical record

According to Adiba, files are a collection of archives arranged based on the similarity of affairs/activities (dosir), similarity of problems (rubric) or similarity of types (series) (Adiba et al,2022). Health record is a collection of data on the health condition of individuals who receive health services, including patient social data, immunization records, physical examination results in accordance with diseases and treatment obtained during health services (Decree of the Minister of Health of the Republic of Indonesia number 377 / Menkes / SK / III / 2007 concerning Professional Standards for Medical Recorder and Health Information, 2007).

In addition to that, according to the regulation, documentation is the records of doctors, dentists, or certain health workers, reports on the results of supporting examinations, records of daily observation and treatment, and all recordings, both in the form of radiological photos, imaging images (imaging), and electro-diagnostic recordings (Permenkes no.269 / Menkes / PER / III / 2008 concerning Medical Records, 2008).

According to William, health record documents contain administrative data and clinical data. Generally, administrative data is identification data that can be linked to patients containing the full name of patient, patient number, address, age, contact person, and informed concern while the clinical data defined as data on the results of examinations, treatments, treatments carried out by health practitioners and medical support for outpatients and inpatients and emergency care. Clinical data / information accumulated in health records is a database (database) that is distinguished in the type of data desired and its usefulness function so as to produce a variety of data / information (William et al,2020).

2.2 Paper-based medical record

According to the Guidebook of Medical Record Indonesia revision 5 of the year 2022, the strong point of paper-based medical records is an integrated form design and maintained record handling; communication between healthcare providers and users of health information can be improved. If standardization of recording formats and medical terminology can be developed, this will facilitate the capture of data / information and its delivery which has an impact on increasing the quality and value of health records.

On the other hand, quality issues, standardization, deadlines for obtaining and speed of completion of work are issues that are always expressed in paper health records. A paper format health record can only be read by one person at the same time and place. This means that paper records will prevent many authorities from getting the information they need at the same time. Furthermore, health records are difficult to have up-to-date data

(update). This is because the active health records owned by patients who often go to the hospital continue to move from one facility to another. Meanwhile, health workers who will update data/information must wait until the paper format health record arrives in his hands.

According to Kusumah, the paper-based medical records are also prone to tearing, vulnerable to water, oil and flammable and easily worn due to frequent misplacement or loss (Waginda,2015)

2.3 Electronic medical record

According to Law No. 11 of 2008 concerning Electronic Information and Transactions, Pub. L. No. Law No. 11 of 2008 concerning Electronic Information and Transacti, the perks of electronic medical record are:

- Allows quick and easy access to information
- Allows backup copies (duplicates) of information that can be retrieved if the original is lost or damaged
- Process large and difficult transactions quickly
- Allows ready access more sophisticatedly and can see the design that suits you want

In the contrary, the weakness of electronic medical record are:

- Lack of clear definition
- Difficult to meet the needs of diverse users
- Lack of standardization
- Potential threats to privacy and security

2.4 Occupational Health Management

According to International Labour Organization (ILO), The Occupational Health and Safety Management System, hereinafter referred to as the K3 Management System, is part of the overall management system which includes organizational structure, planning, responsibility, implementation, implementation, achievement, assessment and maintenance of occupational safety and health policies in order to control risks related to work activities in order to create a safe, efficient and productive workplace. The goals and objectives of the K3 Management System are to create an occupational safety and health system in the workplace by involving elements of management, labor and an integrated work environment in order to prevent and reduce accidents and occupational diseases and create a safe, efficient and productive workplace. The Risk Control Hierarchy is described in point A.8.1.2 of ISO 45001 on Occupational Health and Safety Management System. This Risk Control Hierarchy is a basic thing that must be understood by all occupational safety and health practitioners because it will be the basis for decision making related to risk control in the future.

2.5. Health Complementary Therapy

According to the Regulation (Permenkes No. 15 Tahun 2018 tentang Pengobatan Komplementer), treatment is a health service to individuals including all actions or treatments given to patients in promotive, preventive, curative and rehabilitative efforts. Complementary Medicine - Alternative is unconventional medicine aimed at improving the degree of public health including promotive, preventive, curative and rehabilitative efforts obtained through structured education with high quality, safety, and effectiveness based on biomedical science that has not been accepted in conventional medicine. Biomedical knowledge is a science that includes anatomy, biochemistry, histology, cell and molecular biology, physiology, microbiology, immunology which is used as the basis of clinical medicine.

Every Traditional Health Worker who organizes Complementary Traditional Health Services must carry out recording and reporting. The recording as referred to consists of Client records and means records. Client records as referred to are medical records. Client Records or Medical Records include at least identity, new and old visits, health problems, type of therapy, and description including advice (Anggiat,2022)

3. RESEARCH METHODS

The research was conducted at the Complementary Therapy Center from September 2023 to April 2024. The paper-based medical record files were taken from the period September until December 2023 before the use of electronic medical records. Meanwhile, the digital medical record files were taken from the period January until April 2024 after the use of electronic medical record In this study, the author used a quantitative approach which was descriptive analytic with the cross sectional study method because this study aimed to get an overview by studying the correlation dynamics between variables. Univariate analysis was used to see a picture of the frequency distribution of the observed variables. The data would be presented in tabular (table) and texture (writing) form. In this study, univariate analysis was used to describe the characteristics of employee health record files based on the completeness of administrative data and clinical data. These variables will be categorized according to their respective thresholds that have been determined in the operational definition. Bivariate analysis was performed on two variables to determine the existence of relationships or differences. In this study, a data normality test was carried out first with the Kolmogrov Smirnov test and it was found that the data was not normally distributed, so it was carried out with non-parametric statistical methods, namely using the Mann Whitney test.

The data in this study was collected through secondary data (medical record files) and was measured by the standard checklist from the regulation (Peraturan Menteri Kesehatan Nomor 15 Tahun 2018 tentang Pengobatan Komplementer) containing the completeness of medical records. The population in this study was all paper-based medical record files before the implementation of electronic medical record (150 files) and electronic medical record (150 files) . Therefore, the population in this study was as many as 300 files. The number of samples was calculated based on the statistical formula of difference test 2 averages of 2 different groups (independent).

$$S^2_p = \frac{[(n_1 - 1)\, s_1^2 + (n_2 - 1)\, s_2^2]}{(n_1 - 1) + (n_2 - 1)}$$

$$n = \frac{2\sigma\, [Z_{1-\alpha/2} + Z_{1-\beta/2}]}{(\pi_1 - \pi_{2)}}$$

Based on the sample calculation above, the minimum sample obtained for this study was 27 health record files. This number is then increased by 10% to anticipate the incompleteness of the data from checking the checklist sheet so that the number of samples becomes 30 health record files for each group, namely 30 samples of paper system health record files and 30 samples of electronic health record files. Sampling in this study used a random sampling technique that began by making 2 groups of medical record numbers lists, the 1st group of medical record lists before the implementation of the digital system (paper-based medical record) and the 2nd group of health record number lists after the implementation of the digital system (electronic medical record). Then make a roll of paper numbered with a medical record number of each group . Then, shuffled and took out the paper rolls one by one.

4. RESULTS AND DISCUSSION

4.1. Univariate Test

a. The completeness of the data before the use of electronic medical record (completeness of administrative data before the use of electronic medical record system).

Variable Name	N	Mean	Min	Max	SD
The completeness of administrative data before the use of electronic medical record	30	6,97	4	11	1,692

Component	Patient's Name	Patient's Age	Patient's Occupation
Frequency	25	23	18
Percentage	12%	11%	8,6%

Based on the table above, It can be seen that from 30 files before the use of the electronic medical record, the average completeness of administrative data was 6.97 where the lowest score value was 4 and the highest score value was 11 with a standard deviation value of 1.629. It can also be seen that before using the electronic medical record, the most complete data filled in was the sub-variable of the patient's full name with completeness score 25 out of the 30 files with the completeness score of 12% of the 209 total. On the other hand, the data that was filled in at least completely is the patient's occupation with a completeness score 15 out of 30 files for an average completeness 11% of the 209 total administrative data completeness scores (completeness of clinical data before the use of electronic medical record system).

Variable Name	N	Mean	Min	Max	SD
The completeness of clinical data before the use of electronic medical record	30	2,07	1	3	0,74

Component	Health Problem	Type of Therapy	Medical Record Number
Frequency	18	20	24
Percentage	29%	32,3%	38,7%

Based on the table above, It can be seen that from 30 files before the use of the electronic medical record, the average completeness of clinical data in health record files is 2.07 where the lowest score value is 1 and the highest score value is 3 where 3 is the highest value because the clinical data completeness variable before using the digital system consists of 3 questions with a standard deviation value of 0.74.

It can also be seen that before using the electronic medical record, the most complete data filled in was the medical record number with completeness of 24 of the 30 files with a score 38.7% of the 209 total clinical data completeness score. On the other hand, the data that was filled in at least completely is the sub-variable of health problems with a completeness score 18 out of 30 health record files or an average completeness 29% of the 209 total clinical data completeness scores.

b. The completeness of the data after the use of electronic medical record (completeness of administrative data after the use of electronic medical record system).

Variable Name	N	Mean	Min	Max	SD
The completeness of administrative data after the use of electronic medical record	30	9,33	8	11	0,844

Component	Patient's Name	Patient's Age	Patient's Occupation
Frequency	24	26	27
Percentage	8.5%	9.3%	9.6%

Based on the table above, It can be seen that from 30 files after the use of the electronic medical record, the average completeness of administrative data was 9.33 where the lowest score value was 8 and the highest score value was 11 with a standard deviation value of 0.844. It can also be seen that after using the electronic medical record, the most complete data filled in was the sub-variable patient's occupation with completeness score 27 out of the 30 files with the completeness score of 9.6% of the 209 total. On the other hand, the data that was filled in at least completely is the patient's name with a completeness score 24 out of 30 files for an average completeness 8.5% of the 209 total administrative data completeness scores. (completeness of clinical data after the use of electronic medical record system).

Variable Name	N	Mean	Min	Max	SD
The completeness of clinical data before the use of electronic medical record	30	2,7	2	3	0,46

Component	Health Problem	Type of Therapy	Medical Record Number
Frequency	29	25	27
Percentage	35,8%	30,8%	33,4%

Based on the table above, it can be seen that from 30 files after the use of the electronic medical record, the average completeness of clinical data in health record files is 2.7 where the lowest score value is 2 and the highest score value is 3 where 3 is the highest value because the clinical data completeness variable after using the digital system consists of 3 questions with a standard deviation value of 0.46. It can also be seen that after using the electronic medical record, the most complete data filled in was the health problem with completeness 29 out of the 30 files with a score 35.8% of the 209 total clinical data completeness score. On the other hand, the data that was filled in at least completely is the sub-variable type of therapy with a completeness score 25 out of 30 health record files or an average completeness 30.8% of the 209 total clinical data completeness scores.

4.1. Bivariate Test

Bivariate analysis in this study used an Independent T test because the variables are numerical and categorical unpaired (the group of health record data before the digital system and the group of health record data with the digital system, if the assumption is not met, that is, if the data is not normally distributed, the Mann Whitney test is used.

(Normality Test Data Administrasi dan Data Klinis)

Variable	**Group**	**Kolmogorov-Smirnov *(p-value)***
Administrative data completeness score	Completeness of administrative data before the use of electronic medical record	< 0,001
	Completeness of clinical data before the use of electronic medical record	< 0,001
Clinical data completeness score	Completeness of administrative data after the use of electronic medical record	< 0,001
	Completeness of clinical data after the use of electronic medical record	< 0,001

From the results above, it can be seen that the administrative data score and clinica data have a p-value of < α = 0.05 for the normality test (Kolmogorov –Smirnov) it can be seen that which shows that the data is not normally distributed, then the Independent T test cannot be done, instead a non-parametric Mann-Whitney test is carried out.

(Differences in the completeness of administrative data before and after the use of electronic medical records).

Administrative data	N	Mean Rank	*p-value*
Before the use of electronic medical record	30	18,13	< 0,001
After the use of electronic medical record	30	42,87	

The results of statistical tests have a p-value of < 0.005 indicating that there is a difference in the completeness of administrative data before and after the use of electronic medical records. (Differences in the completeness of clinical data before and after the use of electronic medical records).

Clinical Data	N	Mean Rank	*p-value*
Before the use of electronic medical record	30	23,45	< 0,001
After the use of electronic medical record	30	37,55	

The results of statistical tests have a p-value of < 0.005 indicating that there are differences in the completeness of clinical data before and after the use of electronic medical records.

CONCLUSION

The difference that looks very significant in administrative data before and after electronic medical records is the component of patient work data, this is because previously patient work information was considered not useful for massage actions to be carried out. The impact of incomplete patient work data affects the accuracy of massage points performed by therapists. However, there was an increase in the average score of 24.74 in terms of administrative data of patient employment data before and after the use of electronic medical records.

The difference in completeness that is seen very significantly in clinical data before and after the use of electronic medical records is a component of patient health problems. This happens because the therapist does not conduct anamnesis (interviews related to health information) first before doing the massage. The impact is that patients do not get the right treatment according to their health problems. After the use of electronic medical records, the therapist is required to fill in the patient's health problems and this health problem section will be a locked column that is mandatory to be filled in.

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