



## **The Effect of the Quality of Health Information System to Health Care Management in Dental and Oral Health Care Center South Sulawesi Province**

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**Abstract :** Health information system (HIS) has a role to providing data, information, and health indicators in support of the management process. The purpose of this study was to determine the effect of the quality of health information system from the aspect of availability, relevance, and accuracy to health care management at the Dental and Oral Health Care Center (DOHCC) of South Sulawesi Province. The type of this study was quantitative with cross sectional design. The population in this study were all employees in DOHCC, which were 85 people. The sampling technique in this research was purposive amounted to 76 people. The data were collected through questionnaires. Data were analyzed by chi-square test with a confidence interval (CI) of 95% and  $p < 0.05$ . The statistical test used in this study was logistic regression by using SPSS software. The results showed that there was a significant relationship between HIS from the aspect of availability ( $p = 0.012$ ) and the relevance ( $p = 0.027$ ) to health care management, while HIS from the aspect accuracy ( $p = 0.113$ ) had no significant relationship to health care management in DOHCC of South Sulawesi Province. It was recommended that information technology can be maximum utilized to provide information in improving health services.

**Keywords :** health information system, availability, and management.

### **Introduction**

Health information system is a information management from health care providers to the relevant government agencies systematically in order to give service the community. Legislation that mentions on health information system is the Minister of Health's Decree No. 551/Menkes/SK/V/2002 about policy and development strategy of National Health Information System (NHIS) and Minister of Health's Decree No. 932/Menkes/SK/VIII/2002 about guidance on the development implementation of health information reporting system in district/city<sup>(1)</sup>.

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The development of information and communication technology on health in Indonesia was growing. Health information system were developed to integrate data and information systematically at any levels of government in support of health management. The challenge of health development requires the support of sufficient resources and the right direction of policy and health strategy. However, often the policy makers in the health sector have difficulty in making the right decision because of limitations or unavailability of data and information that are accurate, precise, and fast<sup>(2)</sup>.

Dental and Oral Health Care Center (DOHCC) of South Sulawesi Province is the center of dental and oral health care and referral center in South Sulawesi. The number of patients receiving treatment in DOHCC was increasing from year to year. As the initial data that has been collected by the researchers showed that the number of patients revocation wisdom teeth (impacted) in 2014 was 552 cases and increased to 666 cases in 2015. The problem was the increase in the number of patient visits is not aligned with improvement of the quality of health information system.

Based on reports of Basic Health Research (BHR) in 2013, the prevalence of dental and oral health problems in South Sulawesi Province amounted to 46.5%. The prevalence of people who receive dental care from health workers was highest in Makassar city amounted to 57.5% which in the form of fillings, extractions, and dental surgery that was equal to 70.3%<sup>(3)</sup>.

Another problem that occurs in DOHCC was the regulation of the data of patients who come everyday not well integrated. It has been seen that the data was still recorded in each department and data storage was not centralized that resulted the data was not synchronized.

Previous research has been done by Adejumo<sup>(4)</sup> to assess the quality of routine health information system data in Nigeria. Accuracy of data is one important dimension in assessing the quality of information. But the results show there was often a discrepancy between the documents recorded and reported that made it inconsistent.

The information system was used as a support in the management process. In order for the management of an organization more capable with high level of effectiveness, they must be accompanied by information which were up to date, available, complete, accurate, reliable, properly processed, and stored in a way that is easily searchable when it needed<sup>(5)</sup>. Data that not synchronized were difficult in providing accurate information that will directly impact on the management process as well as effect the quality of service and patient satisfaction<sup>(6)</sup>.

Another study was also been done by Cheburet<sup>(7)</sup> to determine the influence of organizational factors on the quality of health management information system in Uasin Gishu, Kenya. Data availability will be needed to achieve good data quality that can be used as a basis in generating information for policy-making, planning, health monitoring, results and decision-making. This was what lies behind the researchers to determine the effect of health information system to health care management in DOHCC of South Sulawesi Province.

## **Materials and Methods**

### **Location and Study Design**

The study was conducted at the Dental and Oral Health Care Center (DOHCC) of South Sulawesi Province which is currently the referral center of all districts. This type of study was quantitative with cross sectional design.

### **Population and Sample**

The population in this study were all employees in DOHCC of South Sulawesi Province, totaling 85 people. The sampling technique was purposive sampling with inclusion criteria that employees who use health information system and play a role in the health care management amounting to 76 people consisting of 14 structural, administrative, and financial personnel, 37 dentists and specialists, and 25 dental nurses.

## Method of collecting data

Data obtained from questionnaires which distributed directly to the respondent. Respondents itself answered the questions in the questionnaire which contains the identity of the respondents (gender, age, education, and length of working) and questions about the availability, relevance, accuracy, and health care management.

## Data analysis

Data was collected and then tabulated, inputted, and analyzed by using SPSS software. The results of the study presented in tabular form accompanied by explanations. Data were analyzed by chi-square test with a confidence interval (CI) of 95% and  $\alpha = 0.05$ . The statistical test used in this study was the logistic regression by using SPSS software.

## Results

### Characteristics of Respondents

Table 1 showed the distribution of the characteristics of respondents by sex, age, education, and length of working. Most respondents' gender were women as many as 65 respondents (85.5%), while men were 11 respondents (14.5%). Most respondents' age group were 35-39 years as many as 20 respondents (26.3%) and the least were 25-29 years by 7 respondents (9.2%). Most recent education respondents' were S-1 as many as 39 respondents (51.3%) while the least were D-IV were 3 respondents (3.9%). Most respondents' length of working were  $\leq 10$  years is as many as 37 respondents (48.7%), while the least were  $\geq 31$  years by 2 respondents (2.6%).

**Table 1 Characteristics of Respondents by Gender, Age, Education, and Length of Working at the Dental and Oral Health Care Center (DOHCC) of South Sulawesi Province 2018**

No.	Characteristics of Respondents	Category	Frequency	
			N	%
1	Gender	Man	11	14.5
		Woman	65	85.5
		<b>Total</b>	<b>76</b>	<b>100.00</b>
2	Age	25-29	7	9.2
		30-34	9	11.8
		35-39	20	26.3
		40-44	17	22.4
		45-49	13	17.1
		$\geq 50$	10	13.2
		<b>Total</b>	<b>76</b>	<b>100.00</b>
3	Education	High School	7	2.6
		D-I	0	0
		D-III	23	30.3
		D-IV	3	3.9
		S-1	39	51.3
		S-2	<b>9</b>	<b>11.8</b>
		<b>Total</b>	<b>76</b>	<b>100.00</b>
4	Length of Working	$\leq 10$ Years	37	48.7
		11-20 Years	24	31.6
		21-30 Years	13	17.1
		$\geq 31$ Years	2	2.6
		<b>Total</b>	<b>76</b>	<b>100.00</b>

Source: Primary Data, 2018

**Table 2 Influence of Availability of Health Information System to Health Care Management at the Dental and Oral Health Care Center (PPKGM) of South Sulawesi Province 2018**

Availability	Management				Total		Statistic Test
	Sufficient		Less				
	n	%	N	%	N	%	
Quite Available	42	93.3	3	6.7	45	100	<b>p = 0.012</b>
Less Available	22	71.0	9	29.0	31	100	
Total	<b>64</b>	<b>84.2</b>	<b>12</b>	<b>15.8</b>	<b>76</b>	<b>100</b>	

Source: Primary Data, 2018

**Availability**

Table 2 showed that from 45 respondents considered that sufficient information was available at DOHCC, 42 respondents (93.3%) stated that health care management was sufficient and from 31 respondents who considered that less information was available at DOHCC, 9 respondents (29.0%) stated the lack of health care management. Based on the results of the statistical test by using Chi-square test obtained significant value with  $p = 0,012$  where the value was smaller than the value of  $\alpha = 0.05$  ( $p < 0.05$ ) so that it can be said that there was a significant influence between the availability of health information system to health care management at DOHCC.

**Relevance**

Table 3 showed that from 36 respondents who consider that the information was relevant at DOHCC, 34 respondents (94.4%) stated that health care management was sufficient and from 40 respondents who considered that the information is less relevant at DOHCC, 10 respondents (25, 0%) stated that lack of health care management. Based on the results of the statistical test by using Chi-square test obtained significant value with  $p = 0,027$  where the value was smaller than the value of  $\alpha = 0.05$  ( $p < 0.05$ ) so it can be said that there was a significant influence between the relevance of health information system to health care management at DOHCC.

**Table 3 Influence of Relevance of Health Information System to Health Care Management at the Dental and Oral Health Care Center (PPKGM) of South Sulawesi Province 2018**

Relevance	Management				Total		Statistic Test
	Sufficient		Less				
	n	%	n	%	N	%	
Quite Relevant	34	94.4	2	5.6	36	100	<b>p = 0.027</b>
Less Relevant	30	75.0	10	25.0	40	100	
Total	<b>64</b>	<b>84.2</b>	<b>12</b>	<b>15.8</b>	<b>76</b>	<b>100</b>	

Source: Primary Data, 2018

**Table 4 Influence of Accuracy of Health Information System to Health Care Management at the Dental and Oral Health Care Center (PPKGM) of South Sulawesi Province 2018**

Accuracy	Management				Total		Statistic Test
	Enough		Less				
	n	%	n	%	N	%	
Quite Accurate	39	90.7	4	9.3	43	100	<b>p = 0.113</b>
Less Accurate	25	75.8	8	24.2	33	100	
Total	<b>64</b>	<b>84.2</b>	<b>12</b>	<b>15.8</b>	<b>76</b>	<b>100</b>	

Source: Primary Data, 2018

## Accuracy

Table 4 showed that 39 respondents (90.7%) considered that the information was accurate enough and health care management was sufficient at DOHCC and 8 respondents (24.2%) considered that the information was less accurate and lack of health care management. Based on the results of the statistical test by using Chi-square test obtained significant value with  $p = 0,027$  where the value was bigger than the value of  $\alpha = 0.05$  ( $p > 0.05$ ) so it can be said that there was no significant influence between the accuracy of health information system to health care management at DOHCC.

## Multivariate analysis

Table 5 showed the results of logistic regression obtained from the last step in which it can be concluded that the variables were highly influential in the health care management was the relevance of information which 19,438 times larger than the other variables.

**Table 5 The Results of Logistic Regression Analysis on Quality of Health Information System to Health Care Management at the Dental and Oral Health Care Center (PPKGM) of South Sulawesi Province 2018**

	Variables	B	SE	Wald	Sig.	Exp (B)
Step 1 <sup>a</sup>	Availability	.976	.973	1,006	.316	2,653
	Relevance (1)	3,153	1,062	8,821	.003	23 406
	Accuracy (1)	1,048	.875	1,435	.231	2,852
	Constant	-5673	1,315	18 608	.000	.003
Step 2 <sup>a</sup>	Relevance (1)	2,967	.987	9032	.003	19 438
	Accuracy (1)	1,128	.837	1,815	.178	3091
	Constant	-5468	1,244	19 336	.000	.004

Source: Primary Data, 2018

## Discussion

The results showed that the availability of information has a significant influence to health care management at DOHCC of South Sulawesi Province with significance value of  $p = 0.012$  ( $p < 0.05$ ). This was in line with research conducted by Hariana<sup>(8)</sup> in 66 hospitals on Yogyakarta, where the results show that there was a significant correlation between the availability of information system in hospitals with the value of the use of information system for management functions in the hospital. Hospital information system support medical and clinical staff in their daily activities. Where the availability of information system use to support development and patient service comprehensively<sup>(9)</sup>.

Another study was also conducted by Thenu, Sedyono<sup>(10)</sup> in evaluating the information system in health centers on Purworejo District where most of the informants stated that the information was always available. The availability of data and information was a necessary condition in management decision making to achieve national health system goals.

According to Nuraida<sup>(11)</sup>, the availability of data and information is a necessary condition in management decision making to achieve national health system goals. Information should always be accessible to people who need it, and therefore the information should be available at any times and well-organized<sup>(12)</sup>.

From the research that has been conducted shows that the relevance of information has a significant influence to health care management at DOHCC of South Sulawesi Province with significance value of  $p = 0.027$  ( $p < 0.05$ ). Information needed by every organization was the information that truly relevant to the problems, the mission, and goals of the organization. Information considered relevant if the information was related to the decision making purposes. The information received must be relevant to the problems faced.

In line with these findings, Dewi<sup>(13)</sup> has conducted studies to see the effect of management information system to effectiveness employees working in public health department of West Java Province. The result was a quality factor of information through relevant indicators influence the effectiveness of employee where the

system used has produced information that was relevant. The another research has been done conducted by Devi<sup>(14)</sup> about e-health management system which is able to monitor the patients disease form the long range.

Other studies conducted byLestari<sup>(15)</sup> also show similar results where information collected was relevant to management needs. The shape of the information provided to management should be appropriate, precise, and detail so that it can support the process of management in decision making. Quality of information should be the priority for improving health workers performance and health services<sup>(16)</sup>.

As for the accuracy aspect shows that health information system considered less accurate by health workers where accuracy aspect does not have significant influence to health care management at DOHCC of South Sulawesi province where the significant value of  $p = 0.113$  ( $p > 0.05$ ). This was in line with research conducted by Agustin<sup>(17)</sup>, which evaluates the implementation of hospital management information system in pharmacy installation of Solok Hospital. The results show that the accuracy of the information systems has not been in line with expectations. The application was not accurate yet in terms of efficiency, effectiveness, and cost control benefits, so it cannot be used in the decision making process. The disadvantages of system usually because of loss or damage while records and delays in accessing information<sup>(18)</sup>.

The results of the study were quite different has been done by Tampa'i<sup>(19)</sup>, where the level of satisfaction of respondents to the accuracy of the information systems of Immanuel Hospital, Bandung as much as 95% with high levels of satisfaction. Research conducted byWekesa<sup>(20)</sup> also showed similar results, where majority of health care workers who use information systems expressed confident in the accuracy of data from their system. The accuracy of information system providing reliable data and valid representation of reality.

Based on the multivariate test results of the relevant aspects by using logistic regression that were obtained from the last step can be concluded that the variables were highly influential in the health care management was the relevance of information with a value of 19,438 times larger than the other variables. This emphasizes that information was relevant if the information contained in can affect the user decisions to help them evaluate the events of the past or the present, and predict the future, and confirms or corrects the results of their evaluations in the past<sup>(21)</sup>.

## Conclusions and Recommendations

There was a significant influence between availability and relevance to the health care management, there was no significant influence between accuracy to the health care management at DOHCC of South Sulawesi Province. The most influential aspect was relevance which 19,438 times larger than any other aspect. Advice that can be given to the management was to maximize utilization of information technology, which in turn will provide the necessary support for making information management policies and to improve the quality of online-based information system to increases employee effectiveness.

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