



Management Model of School Dental Health Effort (SDHE) of Website-Based for Improving Quality of Information System at Elementary School

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Abstract. Dental and oral health services for elementary school students aged 6 to 12 years have not been optimal. This shows that the implementation of SDHE has not succeeded. Monitoring and evaluation of the performance of SDHE are complex because the reporting system of SDHE all this time is conducted manually at the end of the year using a form combined with the report of the health center. The website-based SDHE management model is an information system that can be used to report the activities of SDHE directly and monitor and evaluate the activities of SDHE to fit the targets that have been set. The study aimed to develop the SDHE management model's innovations with relevant/appropriate information systems to increase the effectiveness and efficiency in the implementation of SDHE in elementary school students. Methods: Research and Development (R&D) and model trials using the technique of pre-experimental. The respondents amounted to 48 populations which consist of 24 dental therapists and 24 teachers, to assess the quality of SDHE management and the quality of information systems in the implementation of SDHE management. The result of the design of the model was tested for validation by an expert. The data were tested using paired difference test, proportion test, and linear regression test. Result: Validation by expert result the average value of 92, the category is very feasible, and with a p-value of 0,014. After the intervention, the E-SDHE information system's quality also improved compared to before ($p = 0.001$). Respondent's assessment stated that the quality of the E-SDHE information system in the excellent category. The SDHE management model of elementary schools based on the website provides a significant increase in SDHE management quality and the quality of information systems in the excellent category. The SDHE of website-based in this study can be used to evaluate elementary school health management.

Key Words: Elementary school students, SDHE management model, information system

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INTRODUCTION

The dental and oral health of Indonesian people needs to get serious attention from health workers, dentists, and dental and oral therapists⁽¹⁾. The results of the National Basic Health Research (Riskesdas) in 2018 stated that 20 provinces had a prevalence of dental and oral health issues above the national number, one of which is the province of D.I. Yogyakarta (2).

The poor state of the oral cavity of primary school children will affect nutrition and impact the quality of life. The activities of children who have dental and oral health issues are 12 times more limited than those who don't have dental and oral health issues (3). More than 50 million school hours are lost per year due to dental and oral health issues that will impact children's school performance (4).

Dental and oral diseases do not cause death directly but lower the productivity of work. That was caused by the Maximum Service Standards (SPM) targeted by the District Health Office have not been fulfilled (5).

The Indonesian government has conducted both promotive and preventive efforts for primary school children through the School's Dental Health Clinic (SDHE). Effective promotive and preventive efforts are aimed at primary school children because dental health care must be done thoroughly to become a habit in children's daily lives from an early age (6).

The percentage of Indonesian people with oral and dental health issues increased for 5-9 years old from 28.9% to 54.0%. The age of 10-14 years old also risen from 25.2% to 41.4%. The most common dental and oral diseases suffered by school-age children are gingivitis and dental caries, 60-90%(2,5).

Dental and oral health services for primary school children aged 6-12 years have not been optimal indicate that the implementation of SDHE has not been on target (7) According to the research of Santoso (2015) regarding the analysis of the SDHE activity programs, it was concluded that the SDHE activities conducted at Halmahera Health Center were not successful (6).

The reporting system on SDHE implementation has been done manually at the end of the year using a form combined with a report from the health center, so it isn't easy to monitor and evaluate the implementation of SDHE (8).

Efforts to improve dental and oral health need to be done, especially in the quality of management, including planning, implementing, monitoring, and evaluating in the implementation of SDHE. Improving the capability of health workers and improving the quality of recording and reporting the existing data to increase the staff's motivation in carrying out the SDHE activities (4).

One solution that the author will conduct to improve the quality of SDHE management and the quality of information systems is the website-based SDHE management model. A website-based SDHE management model can report and evaluate the SDHE activities directly (9). This can be one of the technological solutions to control the process of collecting data efficiently, monitoring activities, time efficiency, cost, and reducing errors in making decisions or taking action on SDHE activities carried out by the health workers and the UKS teachers (10).

RESEARCH METHOD

Research and development (R & D) are applied in this research. The process of information retrieval, model design, expert validation, revision, product testing, revision, application testing, final product revision, and product production. The information retrieval is done by identifying and analyzing the issues experienced in implementing early childhood education programs about

dental health through the qualitative descriptive method with observation and interviews with the Health Office, Dentists, Head of Health Centers, Dental Nurses, and UKS teachers.

The information retrieval results are used to make a design of the website-based SDHE management model that is adjusted to the needs in the implementation of SDHE.

Expert validation tests are conducted to verify the feasibility of the product before it is used publicly. Internal testing is planned to be carried out by six experts. They are health promotion experts, IT experts, health management information system experts, dental and oral health coordinators, health center heads, and dentists.

The data retrieval technique used was a questionnaire, then revised the use of the website-based SDHE management models in improving the quality of primary school dental and oral health. The test was carried out to produce products/models that are suitable to be used.

The product testings were carried out by applying models in natural fields. The design of the test used *pre-experiment* with one group *pretest* and *posttest*. There were 48 respondents, consisting of 24 dental and oral therapists and 24 teachers. Revisions are made if the initial test results do not meet the expected specifications, so it needs to revise the product. The results of the next revision will be used to test the information systems. The product in the form of a website-based SDHE management model (E-SDHE) is the output of the development of the School's Dental Health Clinic (SDHE) management model for primary school students.

Statistical tests for analyzing the data used paired difference tests, proportion tests, and regression tests. The normality test uses Shapiro-wilk. If the data is normal, then the paired t-test is used, whereas it is not normal, then use the Wilcoxon test.

RESEARCH RESULT

Information Retrieval

The information retrieval results concluded that the unsuccessful SDHE implementation had been caused by the lack of monitoring and evaluation of the SDHE program. The implementation of SDHE has not been optimal. Therefore, it is necessary to develop a model to become one of the technological solutions to control data collection, monitoring activities easily, time efficiency, cost, and reduce errors in making decisions or taking action on SDHE activities carried out by the health workers.

Model Design

The findings were obtained in the early stages. The researchers designed and developed a product in the form of a website-based SDHE management model "being created as a tool in implementing SDHE. It previously was a manual into a website-based information system that will also facilitate the health workers in monitoring and evaluating the SDHE activities.

Expert Validation

The evaluation findings from expert validations found that the mean value of the feasibility score was 92.71 with a very decent category (without revision). The *p-value* was 0.014, which is indicated that the website-based SDHE for primary school management model was relevant and worth testing the model.

Table 1. Expert validation result

No	Position	Score	Mean	Category	P-Value*
1.	Health Promotion Expert	98.75			
2.	TI Expert	93.75			
3.	Child Dental Health Information System Expert	96.25			
4.	Public Health Office Kesgilut Coordinator	88.75	92.71	Very Decent	0.014
5.	Public Health Center Head	87.50			
6.	Public Health Center Dentist	91.25			

* *Intraclass correlation coefficient*

Model Testing

The results of normality data for the information system aspects showed the p-value was <0.05. It was indicated that all data were not the normal distribution. Therefore, the non-parametric test was used to analyze the data.

Table 2. normality test of information system data quality

Variables	Statistic P-Value
Quality of System	
Ease of <i>Pretest</i>	0.001
Ease of <i>Posttest</i>	0.000
Punctuality of <i>Pretest</i>	0.001
Punctuality of <i>Posttest</i>	0.001
Usability of <i>Pretest</i>	0.000
Usability of <i>Posttest</i>	0.000
Reliability of <i>Pretest</i>	0.000
Reliability of <i>Posttest</i>	0.000
Security of <i>Pretest</i>	0.001
Security of <i>Posttest</i>	0.000
Quality of Information	
<i>Pretest</i> Data Completeness	0.041
<i>Posttest</i> Data Completeness	0.039
Accuracy of <i>Pretest</i>	0.008
Accuracy of <i>Posttest</i>	0.013
Suitability of <i>Pretest</i>	0.000
Suitability of <i>Posttest</i>	0.000
User Satisfaction (System Use)	
Effectiveness of <i>Pretest</i>	0.001
Effectiveness of <i>Posttest</i>	0.000
Efficiency of <i>Pretest</i>	0.026
Efficiency of <i>Posttest</i>	0.002
Total Score of <i>Pretest</i>	0.087
Total Score of <i>Posttest</i>	0.251

**Shapiro-Wilk*

The p-value for each aspect of the system quality questionnaire was $p < 0.000$. It showed there are the differences of mean score before and after implementing the SDHE management information system.

The p-value on each aspect of the information quality questionnaire is $p < 0.000$. This shows that there are differences in the effectiveness of using the SDHE management information system. The use of the new method produces data that is more suitable with reporting requirements compared to before.

The p-value on each aspect of the user satisfaction questionnaire is $p < 0.000$. This shows that there are differences in the effectiveness of using the SDHE management information system. The use of the new system provides more effective and efficient benefits compared to before.

Table 4. Paired Test Results Information System Quality Aspects Pre and Post the Model Implementation

Aspects of Assessment	Statistic		<i>p-value</i> *
	Pre-test	Post-test	
Aspect of Ease			
a. Mean±SD	54.17±7.83	85.60±7.36	0.000*
b. Min-Max	37-68	75-100	
Aspect of Punctuality			
a. Mean±SD	55.31±6.39	85.52±7.23	0.000*
b. Min-Max	45-70	75-100	
Aspect of Usability			
a. Mean±SD	54.33±12.02	88.00±8.34	0.000*
b. Min-Max	37-75	75-100	
Aspect of Reliability			
a. Mean±SD	56.81±11.82	87.52±9.12	0.000*
b. Min-Max	37-75	75-100	
Aspect of Security			
a. Mean±SD	58.31±11.66	87.23±8.59	0.000*
b. Min-Max	33-75	75-100	
The aspect of the Data Completeness			
a. Mean±SD	57.27±6.94	86.81±6.31	0.000*
b. Min-Max	46-75	75-100	
Aspect of Accuracy			
a. Mean±SD	58.15±7.44	84.76±5.65	0.000*
b. Min-Max	45-70	75-95	
Aspect of Suitability			
a. Mean±SD	61.02±13.00	84.38±8.16	0.000*
b. Min-Max	25-75	75-100	
Aspect of Effectiveness			
a. Mean±SD	55.77±9.90	85.73±6.38	0.000*
b. Min-Max	33-75	75-100	
Aspect of Efficiency			
a. Mean±SD	58.50±10.58	85.67±6.19	0.000*
b. Min-Max	37-75	75-100	
a. Mean±SD	58.40±4.60	87.96±4.60	0.000**
b. Min-Max	50-66	80-97	

*Wilcoxon **Paired t-test

Model Result

The results of the model are the innovation of website-based management of SDHE primary schools that are expected to provide benefits for recording, reporting, monitoring, and evaluating the SDHE program and overcoming the program problems and obstacles faced by SDHE officers so far when using the manual system.

Information system-based SDHE management model intervention begins with training first. Then the respondent is asked to enter data adjusted to the results of the implementation of activities SDHE. Performance of activities includes dental health examination and care, dental health education implementation, and mass toothbrushes for students in primary school.

The system can directly identify student data that has been inputted into the system then generate reports in the form of tables and status graph data on oral health in elementary school students.

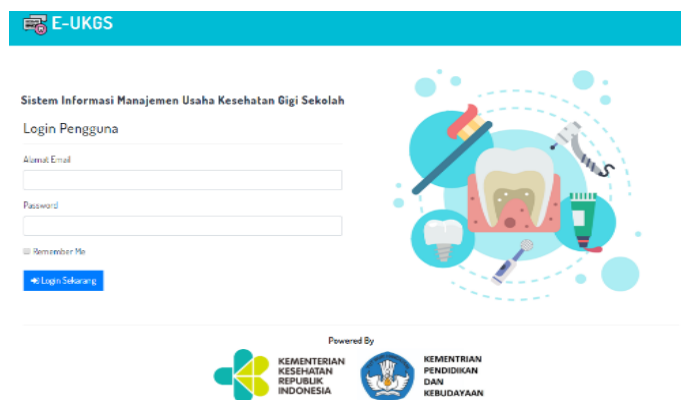


Figure 1. Main Display (www.e-ukgs.pe.hu)

DISCUSSION

The website-based SDHE management model (E-SDHE) is a monitoring or coverage indicator that aims to record, report, monitor, and evaluate the implementation of SDHE in a Public Health working area. SDHE activities are carried out to reduce the number of dental and oral health issues in primary school children. SDHE activities must be routinely carried out so that every student receives dental and oral health services in the form of limited promotive, preventive and curative services according to the needs of each (11)

The *p-value* pre and post the model's implementation to all aspects of the information system quality is $p < 0.000$. According to Santoso (2017), the results of monitoring activities in the information system can be used as a basis for measuring the achievement of promotive, preventive, and referral implementation activities for primary school students (4). The E-SDHE information system can monitor the actions implemented to be appropriately monitored through the system health management information that follows the planning's objectives (13). The E-SDHE information system strongly supports the implementation of program evaluation because the data

displayed has been processed automatically to be done as a basis for determining a health policy for primary school children (14).

Mudiono (2018) stated that the health information system could provide ease in entering data (input), editing or improving data (edit), carrying out the process of searching the data (search) as well as ease in presenting reports which are following the results of the implementation of the SDHE (15) The information produced can provide health workers benefits as a report on the results of SDHE activities (16). This information system is guaranteed to be safe and won't be accessed by other irresponsible parties(17).

E-SDHE produces complete and detailed data in identifying dental and oral health issues of primary school students. The information system is trustworthy and free from elements of error and free from bias (18) This information system can provide benefits that follow dental and oral health reports that are in line with the needs of primary school children (19).

The E-SDHE information system can improve the effectiveness of reducing the workload of health workers still integrated with the service's main tasks (20) The E-SDHE developed in this study produces menus that are quite comprehensive in reporting SDHE activities' results. Data input becomes more efficient for immediate reporting to the district/city health office.

Conclusion

Based on the study results, it can be concluded that the website-based SDHE management model (E-SDHE) is proven to provide a significant improvement in the quality of information systems in the excellent category compared to before.

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