

Information System for Monitoring Community Dental Health Efforts (SIP-UKGM) to Improve the Quality of Community Dental Health Efforts in Puskesmas

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Abstract:- Dental health as an inseparable part of overall health, this has an effect on improving the degree of health and quality of life. Indonesia makes efforts in the National Action Plan for Dental and Oral Health Services 2015-2030, one of which is the implementation of community dental health effort, while in its implementation, 43.8 percent of Puskesmas in Indonesia do not have community dental health effort activities. Information System for Monitoring Community Dental Health Efforts (SIP-UKGM) which can be used to monitor Community Dental Health Effort (UKGM) activities according to the objectives of activity achievement can minimize UKGM obstacles. The aim of this research is to produce a viable and effective UKGM to improve the quality of UKGM at Puskesmas. Research and Development (R&D) and product testing using Pre-Experiment Design with one group pre-post design. The number of respondents was 14 Dental and Oral Therapists to assess the quality of UKGM management, system quality, information quality and service quality of UKGM. Model test data were analyzed using the Interclass Correlation Coefficient, Wilcoxon, and Chi-Square statistical tests. Expert validation test for the SIP-UKGM model obtained a value of 93.62% and $p < 0.001$ with a very feasible category. Management quality, System quality, information quality and overall service quality of SIP-UKGM improved significantly after treatment compared to before ($p < 0.05$). The implementation of SIP-UKGM provides a significant increase in the quality of management quality, system quality, information quality, and service quality compared to before the implementation of SIP-UKGM.

Keywords:- Monitoring, Dental Health Community, Information System, UKGM.

I. INTRODUCTION

Dental health as an integral part of overall health, it is host to improved degrees of health quality of life[1]. According to World Health Organization (WHO), 60-90 % people of the world suffer from caries. On the other hand, severe periodontitis found in 5-15 % part of the world population[2].

Based on the results of the 2018 RISKESDAS in Indonesia, the proportions of Teeth and mouth problems is 57.6 percent, between 10.2 percent Communities that receive services from both medical and dental professionals[1]. Tools and infrastructure are among the factors that affect dental and oral health[3]. Income factors are also one of the reasons people lack the use of dental care[4].

The WHO has developed guidelines for dealing with early childhood caries in primary care, including involving the primary care team, namely Dental and Oral Therapists including Health Cadres, in the prevention and control of early childhood caries as well as monitoring and evaluation. Health workers in primary care facilities including health cadres, who have provided health promotion and care for the community, can contribute to preventing and controlling dental and oral problems[5]. Regarding the effectiveness of minor doctors as health cadres, it shows an increase in students' OHI-S criteria before and after the training[6]

The Ministry of Health as an extension of the Government of Indonesia has made every effort possible, one of which is designing namely the National Action Plan (RAN) for Dental and Oral Health Services 2015 – 2030 which is a continuous part to support the program. 'A caries-free Indonesia 2030' which focuses on resources, policy strengthening, and dental and oral health services. The achievement of the program is planned to be carried out through stages every 5 years, one of which is the implementation of UKGM. Community Dental Health Efforts (UKGM) with promotive-preventive measures has been carried out comprehensively through Posyandu at the Puskesmas. The goal is to improve the oral health of pregnant women, infants, preschoolers and toddlers[7].

This low achievement is due to the following constraints: 1) Lack of knowledge and ability of managers in dental and oral health efforts to organize, plan, implement and monitor dental health promotive-preventive efforts in an integrated manner with cross-sector/related programs[8], 2) The absence of a clear dental health advisory forum at the provincial and district/city levels, the absence of a dental health program holder at the Health Office which causes monitoring and evaluation to not be carried out[9], 3) The delay in sending reports is one of the obstacles that monitoring and evaluation of these activities have not run optimally[10]. One of the provinces showed a fairly high number of 43.8 percent did not carry out UKGM activities at the Puskesmas, namely South Sulawesi, and 61.1 percent of the Puskesmas did not receive guidance/supervision from the Health Office[11].

Health Information System (SIK) is described as an integrated management used to guide decisions and actions related to information, data, procedures, technology, indicators and human resources in the health development process[12]. With the support of current technological developments, manual monitoring activities can be excused with a computer information system[13].

Based on the phenomena above, as well as the underlying theories and the importance of the need for a monitoring information system, the researcher is interested in conducting research on the Community Dental Health Efforts Monitoring Information System (SIP-UKGM) to improve the quality of Community Dental Health Efforts at the Community Health Center.

II. METHODOLOGY

The research model to be carried out is the research and development (R&D) method, with five stages i.e. Information collection, Product and model design, Expert validation, Model/product test, Model/Product[14]. SIP-UKGM was developed using the System Development Life Cycle (SDLC) method with basic stages is Data Collection Stage, System Planning Stage, System Analysis Stage and System Development Phase and Implementation Test Phase[15].

The research design used is a Pre-Experimental Design with a one group Pre-post Test design because there are no groups control[16]. The research sample used a purposive sampling technique with 14 dental and oral therapists at the Puskesmas (The Public health center) in the working area of the Maros, south Sulawesi, and District Health Office as respondents to assess the quality of management, system, information and service quality of SIP-UKGM. The data from the model test were analyzed using the Interclass Correlation Coefficient, Wilcoxon, and Chi-Square statistical tests.

III. RESULTS AND DISCUSSION

A. Data Collection

The results of data collection conducted interview method and the Systematic Literature Review concluded that the system reporting UKGM activities carried out direct monitoring and evaluation of UKGM in order to comply with the set targets[17]. This is considered important as an indicator of the success of the program, it can be seen between in accordance with the planned process, in accordance with the objectives, in providing guarantees for the process and objectives, through a harmonious control mechanism in one system[18].

B. Design and Build

The collection of information produces data that is used to design an Information System for Monitoring Community Dental Health Efforts (SIP-UKGM) tailored to the needs of the implementation of monitoring UKGM activities.

The system designs obtained from the gathering of information, and then do with the stages of system development System Development Life Cycle (System Development Life Cycle - SDLC) with the theory of measure the success of the Information Systems updated by DeLone and McLean.

C. Expert Validation

Validation of experts consisting of 3 people validator that IT Expert, Expert Dental and Oral Health Promotion Expert Dental and Oral Health Management as follows:

Table I. Expert Validation

Expert	Score	Mean	Category	p-Value*
IT	87,5 %	93,62 %	Very feasible	<0,001
Dental and Oral Health Promotion	94,11 %			
Dental and Oral Health Management	99.26 %			

* *Interclass correlation coefficient*

The results of expert validation show the average value of the three experts with a score of 93.62% in the very feasible category, which means that the Information System for Monitoring Community Dental Health Efforts (SIP-UKGM) is feasible to improve the quality of Community Dental

Health Efforts at the Puskesmas. Expert validation is carried out according to the field being researched and mastering a particular field[19].

D. Model Test

The results of the data normality test on the UKGM Composite Variables in table II are not normally distributed, so the next analysis for hypothesis testing uses non-parametric analysis, namely the Wilcoxon test.

Table II. Normality test of SIP-UKGM quality

Variables	p-Value*	
	Pretest	Posttest
Management Quality	0,160	0,013
System Quality	0,132	<0,001
Information Quality	<0,001	<0,001
Service Quality	<0,001	0,003

**Shapiro-Wilk*

Overall the value of the quality of UKGM experienced differences before and after giving SIP-UKGM to respondents with a p-value <0.05. Based on the calculation of the effect size data from the quality of the system, the value is 3.15 > 1.00, it can be concluded that the application of SIP-UKGM has a high effect (Strong Effect).

Table III Results SIP-UKGM Quality Aspects Pretest and Posttest

Variables	Statistic				
	Pretest	Posttest	Delta (Δ)	EffectSize	p-Value*
Management Quality a. Mean±SD b. Min-Max	43,21±4,09 34-48	51,43±5,89 45-63	8,21±6,79	1,39	<0,001
System Quality c. Mean±SD d. Min-Max	30,43±2,31 26-34	52,64±7,05 47-64	22.21±7.38	3,15	<0,001
Information Quality a. Mean±SD b. Min-Max	19,79±3,46 10-27	33,07±4,61 30-40	13,29±5,78	2,88	<0,001
Service Quality a. Mean±SD b. Min-Max	9,00±1,71 5-10	15,57±2,76 10-20	6,57±3,29	2,38	<0,001

**Wilcoxon*

Table III shows the p-value on the quality of management before and after giving SIP-UKGM <0.05. This shows that SIP-UKGM provides more effective and efficient benefits to the quality of UKGM management at the Puskesmas. This conclusion is reinforced by the results of the calculation of the effect size of the management quality of 1.39 > 1.00, which means that SIP-UKGM to improve the quality of UKGM in Puskesmas is in the category of high effect (Strong Effect). SIP-UKGM was developed to meet the needs of dental and oral health services. It can be developed through a collaborative process, one of which is in the planning process in management[19]. The implementation of a dental and oral health program in the community requires a monitoring indicator or coverage that aims to report, monitor, and evaluate the implementation of UKGM in a Puskesmas working area[20].

Overall the value of the quality of the system experienced a difference before and after giving SIP-UKGM to respondents with a p-value <0.05. Based on the calculation

of the effect size data from the quality of the system obtained a value of 3.15 > 1.00, it can be concluded that the application of SIP-UKGM has a high effect (Strong Effect).

The ease of the system is related to the quality and performance of the system, one of which is the speed in data processing[21]. The need for security in the quality of the system is very important for the health information system so that the data stored in the system is not lost and kept confidential for certain information [11].

The overall quality of information experienced an effective change before and after the SIP-UKGM intervention with a p-value of <0.001 (p<0.05). These results are reinforced by the calculation of the effect size of 2.88 > 1.00, which means that the information quality of SIP-UKGM has an effect size with a high effect category (Strong Effect) before and after the implementation of SIP-UKGM.

Accuracy in the quality of information systems as supporting services to patients is needed to improve services to patients and other related environments[22], to produce accurate information, it requires commitment and persistence of health workers [9].

Overall service quality shows differences in the effectiveness of use before and after the administration of SIP-UKGM with a p-value of <0.001 ($p<0.05$). This result is reinforced by the effect size value of $2.38>1.00$ with the category (Strong Effect), it can be concluded that SIP-UKGM has a high effect before and after its implementation.

The speed of response in an information system is a measurement of the extent to which the ability of the information system to respond to requests from system users [10]. These results are relevant to the research that results in the speed of response of information system users as an indicator of measuring service quality and has a positive and significant value [11]

E. Model Result

Researchers innovate the UKGM Monitoring Information System whose use is to support the systematic management of the information cycle for UKGM activities in an integrated manner in an effort to improve services to the community and to convert the program problems faced by dental and oral therapists in implementing UKGM activities at the Puskesmas which have been using a manual system.

Dental and oral therapists were trained before using SIP-UKGM. Then the respondents input data on the results of UKGM activities using SIP-UKGM independently for 1 month. Data collection includes patient data, activity data, activity documentation, and funding and referral letters if needed in the UKGM implementation.

The system can generate statistical data input results in the form of graphs, tables, and the number of dental and oral health in the community.



Fig 1:- Dashboard view SIP-UKGM

IV. CONCLUSION AND RECOMMENDATIONS

Based on the results of the study, it can be concluded that the Community Dental Health Efforts Monitoring Information System (SIP-UKGM) is feasible and effective to be applied to monitoring management quality, system quality, information quality and UKGM service quality at the Puskesmas.

Suggestions given from the author are that other systems related to efforts to improve dental and oral health can be developed that are integrated with health information systems in general.

REFERENCES

- [1]. Kementerian Kesehatan RI, "Rencana Program Pelayanan Kesehatan Gigi dan Mulut," 2012.
- [2]. Pemerintah Republik Indonesia, "UU No 36 Tahun 2009 Tentang Kesehatan," vol. 2, no. 5, p. 255, 2009
- [3]. Kementerian Kesehatan RI, "Permenkes 89 tahun 2015 tentang Upaya Kesehatan Gigi dan Mulut,"
- [4]. Kementerian Kesehatan RI, "Hasil Utama Riset Kesehatan Dasar (RISKESDAS) 2018," vol. 44, no. 8, pp. 1–200, 2018,
- [5]. R. O. Rundungan, N. W. Mariaty, and A. J. M. Rattu, "Analisis Kinerja Petugas Kesehatan Gigi Terhadap Pelayanan Kesehatan Gigi dan Mulut di Poliklinik Gigi RSUD Datoe Binangking Kabupaten Bolaang Mongondow," *JIKMU*, vol. 5, no. 2a, 2015
- [6]. R. Variansi and M. I. Ayatullah, "Faktor-Faktor yang Berhubungan dengan Pemanfaatan Pelayanan Kesehatan Gigi Ibu Hamil," *J. Oral Heal. Care*, vol. 8, no. 1, pp. 28–34, 2020
- [7]. N. M. Sirat, A. A. Senjaya, and N. N. Sumerti, "Efektivitas Pelatihan Dokter Gigi Kecil Untuk Meningkatkan Kebersihan Gigi Dan Mulut," *J. Kesehat. Gigi*, vol. 6, no. 1, pp. 5–9, 2019
- [8]. World Health Organization (WHO), *Ending childhood dental caries: WHO implementation manual. Geneva: World Health Organization; 2019. Licence: CC BY-NC-SA 3.0 IGO.* 2019.
- [9]. Arnetty, "Analisis Pelaksanaan Program Program Pelayanan Kesehatan Gigi dan Mulut untuk Meningkatkan Mutu Layanan pada Puskesmas di Kota Bukittinggi," *J. Chem. Inf. Model.*, vol. 53, no. 9, pp. 1689–1699, 2013
- [10]. Andriani, "Analisis Pelaksanaan Program UKGMD Ditinjau dari Berbagai Faktor Penyebab di Desa Kandang Kecamatan Darul Imarah Kabupaten Aceh Besar Tahun 2014," *J. Pionir*, vol. II, 2014.
- [11]. Kementerian Kesehatan RI, "Riset Fasilitas Kesehatan 2011," 2011.
- [12]. Kementerian Kesehatan RI, "Peraturan Pemerintah RI No 46 Tahun 2014 tentang Sistem Informasi Kesehatan," no. 184, pp. 1–27, 2014.
- [13]. M. F. A. Gani, H. F. Wowor, and F. D. Kambey, "Sistem Informasi Manajemen Pemantauan Pembayaran Pajak Bumi dan Bangunan di Kota Tidore Berbasis Web," *J. Tek. Inform.*, vol. 8, no. 1, 2016
- [14]. [S. E. D. Jatmika, M. Maulana, Kuntoro, and S. Martini, *Buku Ajar Pengembangan Media Promosi Kesehatan.* Yogyakarta: K-Media, 2019.
- [15]. E. Sutanto, *Pemrograman Android Dengan Menggunakan Eclipse & StarUML.* Surabaya: Airlangga Universitas Press, 2018.
- [16]. M. Yusuf, *Metode Penelitian Kuantitatif, Kualitatif & Penelitian Gabungan.* Jakarta: Prenadamedia Group, 2014.

- [17]. A. Anggito and J. Setiawan, *Metodologi penelitian kualitatif*. Sukabumi: CV Jejak, 2018.
- [18]. B. Santoso, N. Gejir, and D. Fatmasari, "Information System Monitoring Model Implemented in School Health Dental Unit," *ARC J. Dent. Sci.*, vol. 2, no. 4, 2017
- [19]. G. M. K. Sakti, K. Rustandi, N. P. Putri, and Dkk, "Rencana Aksi Nasional Pelayanan Kesehatan Gigi dan Mulut Tahun 2015-2019," p. 8, 2016
- [20]. S. Mardelita, "Hubungan Program UKGMD dengan Pengetahuan Ibu tentang Pemeliharaan Kebersihan Gigi dan Mulut Balita di Desa Jantang Lhoong Aceh Besar," *J. Aceh Med.*, vol. 4, 2020.
- [21]. Salikun, H. Nugraheni, and T. Wiyanti, *Promosi Kesehatan Gigi dan Mulut*. Yogyakarta: CV.Andi Offset, 2018.
- [22]. F. Fankari, H. Pietojo, and Z. Shaluhiyah, "Keterampilan Perawat Gigi Melaksanakan Kegiatan Promosi dan Prevensi Kesehatan Gigi dan Mulut di Kota Kupang," *J. Promosi Kesehat. Indones.*, vol. 7, no. 1, pp. 10–19, 2012