DEVELOPING E-HEALTH KIA AS AN INNOVATION ON MATERNAL AND CHILD HEALTH SERVICES BASED ON ANDROID APPLICATION FOR QUALITY IMPROVEMENT OF HEALTH SERVICES IN INDONESIA

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ABSTRACT

Purpose: The objective of this research was to develop KIA E-Health, as a novelty, in maternal health services based on the Android application to improve the quality of Indonesian health services.

Theoretical Framework: The main activities of the SSM are the main actions to implement the SSM’s health efforts, while other main activities are aimed at improving the objectives of the main SSM activities.

Method: The method used in this research was the SDLC (Software Development Life Cycle), a cycle used for the creation or development of information systems, with the aim of solving problems effectively, the development of the selected system is the waterfall method.

Results and conclusions: They saw that the application of E-Health KIA is the validity of the experts, that is, the value of the participants and nurses. In the app display indicator, you saw a good image of 27 people (90%) in the app operating indicator, and the OS reached 20 people (66%) in the app material presentation indicator, in which 28 people were suitable, or in the app language usage indicators, all respondents indicated that it was easily understood.

Research Implications: Healthcare personnel must innovate in the service to improve the quality of excellent service, meet the needs and expectations of patients.

Originality/value: It is important to innovate in health services, including maternal health (HCM), to improve the quality of service, with the aim of achieving patient satisfaction. Kia E-Health is one of the technology-based services to improve the quality of services.

Keywords: innovation, e-health Kia, Mch services, quality improvement.

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DESENVOLVER KIA DE E-SAÚDE COMO UMA INOVAÇÃO EM SERVIÇOS DE SAÚDE MATERNA E INFANTIL COM BASE EM APLICAÇÃO ANDROID PARA MELHORIA DE QUALIDADE DE SERVIÇOS DE SAÚDE NA INDONÉSIA

RESUMO

Propósito: O objetivo desta pesquisa foi desenvolver KIA E-Health, como uma novidade, em serviços de saúde materna com base na aplicação Android para melhorar a qualidade dos serviços de saúde indonésios.

Quadro Teórico: As principais atividades do MUS são as principais ações para implementar os esforços de saúde do MUS, enquanto outras atividades principais visam melhorar os objetivos das principais atividades do MUS.

Método: O método utilizado nesta pesquisa foi o SDLC (Software Development Life Cycle), um ciclo utilizado para a criação ou desenvolvimento de sistemas de informação, com o objetivo de resolver problemas efetivamente, o desenvolvimento do sistema selecionado é o método em cascata.

Resultados e conclusões: Eles viram que a aplicação da KIA de E-Saúde é a validade dos especialistas, ou seja, o valor dos participantes e enfermeiros. No indicador de exibição do aplicativo, você viu uma boa imagem de 27 pessoas (90%) no indicador de operação do aplicativo, e o sistema operacional atingiu 20 pessoas (66%) no indicador de apresentação do material do aplicativo, no qual 28 pessoas eram adequadas, ou nos indicadores de uso do idioma do aplicativo, todos os entrevistados indicaram que era facilmente compreendido.

Implicações da pesquisa: O pessoal de saúde deve inovar no serviço para melhorar a qualidade do serviço excelente, atender às necessidades e expectativas dos pacientes.

Originalidade/valor: É importante inovar em serviços de saúde, incluindo saúde materna (CMH), para melhorar a qualidade do serviço, com o objetivo de alcançar a satisfação do paciente. Kia E-Health é um dos serviços baseados em tecnologia para melhorar a qualidade dos serviços.

Palavras-chave: inovação, Kia de e-saúde, Serviços Mch, melhoria da qualidade.

1 INTRODUCTION

The goal of health development organized by the Puskesmas (Primary Health Care) is to support the achievement of national health development goals, namely to increase awareness, willingness and ability to live healthy for everyone who lives in the working area of the Puskesmas so that the highest degree of health is realized in the framework of realizing Healthy Indonesia (Frangky et al., 2020). The function of the Puskesmas is as a center for driving health-oriented development, a community...
empowerment center, as well as a strata I health service center which includes individual health services & community health services. (Gurning et al., 2021). Puskesmas is a technical implementing unit in the Health Service, it is also encouraged to always improve performance in accordance with the functions it carries out (Handayani et al., 2010). One form of evaluating the performance of the health sector, especially the Puskesmas is by looking at the level of community satisfaction (Ma’rufi et al., 2015). To be able to provide comprehensive health care services to all people in their working areas, Puskesmas (Primary Health Care) runs several basic health care services which include several programs, one of which is the Maternal and Child Health Program (Amir et al., 2019).

Health services are any efforts that are carried out individually or jointly in an organization to maintain and improve health, prevent and cure disease, and restore the health of individuals, families, groups and communities (WHO, 2016). The requirements for good health services can at least be divided into 13 types, namely available, comprehensive, integrated, continuous, equitable, independent, appropriate, acceptable, accessible, affordable, effective, efficient, and quality (Kholik et al., 2022). One of the health problems that is still a priority to be addressed in health development in Indonesia is the high morbidity and mortality rates, especially those that occur in groups of people at high risk of disease, namely infants, toddlers and pregnant women. (Indonesian Ministry of Health, 2021).

2 THEORETICAL FRAMEWORK

Maternal and Child Health is a comprehensive and integrated effort that includes improvement, prevention, healing and recovery (Listyorini & Wijananto, 2019). This health care service is carried out through various main activities aimed at the health interests of the family as the smallest unit of society (Luthfia & Alkhajjar, 2019). One of the main activities of the puskesmas (Primary Health Care) for pregnant women is the welfare of mothers and children (Herfanda & Subiyatun, 2021). The main activities of MCH are the main activities in implementing MCH health efforts, while other main activities are directed at supporting the objectives of the main MCH activities. (Benyamin, 2013). Health workers have an important role in maternal and child health (MCH) services at the Puskesmas (Primary Health Care), so they are expected to be able to adapt to technology so that it is easier, faster, more precise, effective and efficient (Bustami et al., 2017). Technology that currently developing have the potential to change health service delivery
techniques worldwide including in Indonesia providing opportunities to integrate health with e-health (Tumbuh & Di, 2021). So with these conditions, health services become dynamic to continue to innovate (Lestari, 2018).

3 METHODOLOGY

This research uses the SDLC (Software Development Life Cycle) method, namely the cycle used in the creation or development of information systems that aim to solve problems effectively (Wahyudi, 2018). The selected system development is the waterfall method. The Waterfall method is the earliest SDLC approach used for software development (Singh et al., 2015). There are six stages in general in the SDLC, namely: (1) System analysis, namely making an analysis of the ongoing management work flow (2). Design Specification of system requirements, namely detailing what is needed in system development and making plans related to system projects (3). System construction, namely making management workflow designs and programming designs needed for information system development (4). System implementation, namely the stage of running the system according to their respective functions (5). System testing, namely testing the system that has been made (6). System maintenance, namely implementing and maintaining the system that has been made (Lucini et al., 2021).

During the data collection process for experts and users, namely pregnant women for the validity process, the researchers facilitated instructions for using the E-Health KIA application, how to download and install it. Data collection was carried out at Health Services in Bengkulu Province-Indonesia by directly distributed questionnaires to all respondents and they filled them out after the E-Health KIA application was used.

Figure 1. The waterfall method (SDLC) in the development of the E-Health KIA application as an Innovation on Maternal and Child Health Services Based on Android Application for Quality Improvement of Health Services

3.1 POPULATION OF THE STUDY

The population in this study were midwives, nurses and pregnant women as users who are visiting to Health Services in Bengkulu Province-Indonesia. The sampling technique uses Non Probability Sampling with purposive sampling method, in which respondents meet predetermined criteria for appropriate research needs. The type of data used in this study was primary data and secondary data. Primary data was obtained through a questionnaire, and secondary data was obtained through the Health Office and patient registers at the Puskesmas (Primary Health care) in Bengkulu Province-Indonesia (Noronha et al., 2023).

3.2 RESEARCH INSTRUMENTS

The research instrument uses questionnaire consists of 12 questions posed to experts with question items regarding suitability of content and objectives, suitability estimated gestational age, calculating the ideal body weight for pregnant women, calculating infant weight, calculating the estimated fertile period, as well as technical and design of application. While the questionnaire for users (pregnant women) consists of 10 question items about application appearance, application operation, presentation of material, and language utilization. The development of E-Health KIA application is carried out by experts (software developers) so that product quality can be valid. Data collection is carried out after the application product is complete, then control is carried out on data quality, data analysis, and preparing research results concepts.

4 RESULTS AND DISCUSSION

4.1 DEVELOPMENT OF E-HEALTH KIA BASED ON ANDROID APPLICATION

In developing this application, a usecase diagram is needed which explains how the system to be built works from the point of view of the object as the user of the system. And explain the activities carried out by actors as users. The use case diagram of the system in E-Health KIA application can be seen in figure 2 as follows:
Figure 2. Use case diagram of E-Health KIA application as an Innovation on Maternal and Child Health Services Based on Android Application for Quality Improvement of Health Services.

E-Health KIA designed using an application based on Android OS. It consists of several main services or features including health information, pregnancy information, immunization schedule, calculator feature (pregnancy calculator, ideal weight calculator for pregnant women, toddler weight calculator, fertility calculator), survey feature, and consultation feature. This feature can be seen in figure 3 (Siswadi et al., 2023).
The next page is health information feature consists of some information, namely (Health of pregnant women, infants and toddlers, school age, adolescents, adults and the elderly). This can be seen in Figure 4. With comprehensive information, couples can prepare for physical, mental and social health conditions in planning a healthy pregnancy. An ideal pregnancy is a pregnancy that is planned, desired and maintained for its development.
Maternal and child health services are part of family health services provided by Puskesmas (Primary Health Care) with the main targets being pregnant women, infants and toddlers (Tarigan & Dhamanti, 2023). E-Health KIA is an effort made in order to increase knowledge and awareness for pregnant women about pregnancy health from conception to delivery, even in the span of the life cycle. This Android-based application is easily accessible by pregnant women which is used to educate in promotive and preventive efforts so that the risk of harm in pregnancy can be minimized.
4.2 VALIDITY TEST

The validity test for E-Health KIA was carried out in 2 steps, namely by experts and midwives including nurses and for users, namely pregnant women. The first step in this trial was provided an opportunity to 30 midwives and nurses to try the application that had been made and then given a questionnaire to filled out. The questionnaire consists of 12 questions containing three indicators, namely suitability of content and objectives, as well as technical and design. The results of the questionnaire are presented in Table 1.

Table 1. Validity test of E-Health KIA by nurses and midwives (experts) in developing of E-Health KIA application as an Innovation on Maternal and Child Health Services Based on Android Application for Quality Improvement of Health Services

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Very Suitability</th>
<th>Moderate Suitability</th>
<th>Lack of Suitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Suitability of content and purpose</td>
<td>n=24 (80%)</td>
<td>n=4 (13%)</td>
<td>n=2 (7%)</td>
</tr>
<tr>
<td>2</td>
<td>Suitability estimated gestational age, calculating the ideal body weight for pregnant women, calculating the weight of toddlers, calculating the estimated fertile period</td>
<td>n=20 (66%)</td>
<td>n=6 (20%)</td>
<td>n=4 (14%)</td>
</tr>
<tr>
<td>3</td>
<td>Technical and design</td>
<td>n=19 (63%)</td>
<td>n=8 (26%)</td>
<td>n=3 (11%)</td>
</tr>
</tbody>
</table>


4.3 EVALUATION THE USABILITY OF THE APPLICATION

E-Health KIA application was tested for usability by giving 30 pregnant women as users to try the application that had been made and then asked to filled out a questionnaire containing responses to the application media made. The results of the questionnaire given to parents are presented in Table 2.

Table 2. Percentage of Evaluation Usability of Application by pregnant women in Developing of E-Health KIA application as an Innovation on Maternal and Child Health Services Based on Android Application for Quality Improvement of Health Services

<table>
<thead>
<tr>
<th>No</th>
<th>E-Health KIA Application</th>
<th>Indicator</th>
<th>Respondents (N=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Amount (n)</td>
<td>Percentage(%)</td>
</tr>
<tr>
<td>1</td>
<td>Application View</td>
<td>Good</td>
<td>27 90%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not good</td>
<td>3   10%</td>
</tr>
<tr>
<td>2</td>
<td>Application Operation</td>
<td>Easy</td>
<td>20 66.66%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult</td>
<td>10 33.34%</td>
</tr>
<tr>
<td>3</td>
<td>Material Presentation</td>
<td>Suitability</td>
<td>28 93.33%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not Suitability</td>
<td>2 6.64%</td>
</tr>
<tr>
<td>4</td>
<td>Language Utilization</td>
<td>Easy</td>
<td>30 100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult</td>
<td>0   0%</td>
</tr>
</tbody>
</table>

4.4 DISCUSSION

Puskesmas (Primary Health Care) as the main health service center must provide quality basic health services including maternal and child health services (Sanah, 2017). The quality of service is closely related to the fulfillment of needs according to patient expectations, affordable and standardized (Fahriani & Ningsih, 2022). Health workers must try to provide quality and standardized services in the delivery of services including the quality of MCH (Maternal and Child Health) services (Lestari, 2020). Hospitals or primary health care must also adapt to technological advances in carrying out their services (Anggraeny, 2013). The urgency of conducting this research is that maternal and child health services (MCH) are an important part of health services in hospitals or health centers that are comprehensive, starting from pre-conception, pregnancy, childbirth and BBL (birth weight), postpartum, pre-school, toddlers to the elderly who need routine checks and regularly with the ultimate goal of reducing maternal and child mortality. This study was to developing of E-Health KIA application as an Innovation on Maternal and Child Health Services Based on Android Application for Quality Improvement of Health Services in Indonesia and this application has simple features and can be easily used by users.

The results obtained from all stages are that this information system device can help remind pregnant women to increase their knowledge and awareness of the health of their pregnancy and can carry out periodic checks for the growth and development of their babies, besides that pregnant women can do calculations estimated gestational age, calculating the ideal body weight for pregnant women, calculating the weight of toddlers, and calculating the estimated fertile period. Knowledge of pregnant women about pregnancy has an important role related to health during pregnancy (Bayisa et al., 2022). If a pregnant woman has good knowledge about high-risk pregnancies, it is likely that the mother will think about determining attitudes, behaving to prevent, avoid or overcome the problem of the risk of pregnancy so that the mother has awareness to check her pregnancy (Shamanewadi et al., 2020). Based on the results of the usability evaluation of E-Health KIA application for pregnant women obtained results on the application display indicator which stated a good appearance by 27 (90%) people, on the application operation indicator which stated that the operating system was easy as many as 20 people (66%), on the material presentation indicator in the application which stated suitability as many as 28 people or (93%), and on indicators of language utilization in applications all
respondents stated that they were easy to understand. In modern times like today, information technology is developing rapidly and everything is becoming digital, for example, the world is in our hands, that means the information system on Android can be used anywhere for pregnant women and their families to get early education to reduce the risk of risks of pregnancy and can be used in preparation for delivery that is safe for the mother and baby, so that pregnant women can avoid it and can be an excellent consideration for pregnant women in making decisions (Ventola, 2014).

5 CONCLUSION AND SUGGESTION

Technological advances cause changes in all sectors including health services (Yoga, 2019). The developed E-Health KIA application can be used as an appropriate method for innovating maternal and child health services in order to reach effective and efficient services. This system can assist pregnant women in monitoring the health of pregnancy up to birth and baby care, in addition to making it easier for midwives or nurses (health workers) to work effectively with the achievement of achieving maximum care fulfillment starting from promotive, preventive, curative and rehabilitative efforts. E-Health KIA application is easy to use in its operating system, the content and purpose are appropriate, and the language used is easy for users to understand. Therefore it is suggested to Puskesmas (Primary Health Care) in Indonesia to use technology such as android-based applications in providing MCH (Maternal and Child Health) services in order to facilitate access and improve the quality of health services.

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