



Alternative Efforts to Reduce Stunting Risk for Children using Electronic Child Cards

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Abstract

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BACKGROUND: World Bank data for 2020 show that the prevalence of stunting in Indonesia is still very high, ranking 115th out of 151 countries in the world.

AIM: The purpose of this study is to provide alternative solutions in an effort to reduce the risk of stunting in children. The effort is meant by designing an electronic child card as an android-based stunting monitor. By utilizing android, it is hoped that stunting monitoring participation will be wider by involving community participation. This electronic child card is designed in such a way that it can be accessed anytime, anywhere, and by anyone.

METHODS: The research design is Research and Development (R&D) in a multi-year scheme. The development of this research is based on the Maternal and Child Health manual book. The population in this study consisted of focus group discussion (FGD) participants, experts, and inmate participants. There were 10 FGD participants consisting of various related parties, to provide information on the design features required for the design of the card and android designs. Inmates are participants who represent potential users, as many as 11 respondents. The sample was selected using purposive sampling method. The results of the FGD and the expert consul produced variables in the form of features including: The identity of the parents; child identity: Age, height, weight, and head circumference. The research instrument used was an observation sheet. Data analysis: Used descriptive analysis and tested for validity and reliability.

RESULTS: It indicates that the features contained in the electronic child card design are in accordance with the Maternal and Child Health book, namely, the identity of the parents; child identity: Age, height, weight, and head circumference. Furthermore, the application design is carried out on Android and tested on participants. The socialization and training in filling out the electronic child card were attended by 30 participants consisting of parents and health cadres.

CONCLUSION: Monitoring stunting with an electronic child card greatly facilitates users in monitoring the risk of stunting in children under five.

Introduction

Monitoring the growth of children as the nation's successor is very important to note. The period of the first 1000 days, which is 270 days during pregnancy and 730 days of the first life of a baby being born, is a sensitive period, because at this time, nutrition is very influential on the growth of the baby as a result of not fulfilling nutritional adequacy when the baby is permanent and cannot be repaired (Sumasto *et al.*, 2021) [1]. This adverse impact is not only on physical growth but also mental development and intelligence of children. Nutrition is one of the factors that determine the success of achieving optimal growth in infancy. The golden period of growth requires good and proper nutritional support. Malnutrition in this early life can cause growth faltering (failure to thrive) so that the baby will grow into a shorter child or stunting (Suryani and Carudin, 2017) [2].

The electronic child card in this study is used as a card that has integrated access to the child's data base, making it possible to be accessed by anyone and anywhere. The child card in this study is not a health card, which is used to obtain medical facilities in health services. Technology needs to be used for monitoring the growth and development of children under five (Warrohmah *et al.*, 2018) [3]. At present, data storage for measuring the growth and development of infants/toddlers is using the book on maternal and child health. This book is brought by parents, or sometimes stored by Posyandu cadres, so there is a risk of experiencing problems such as lost, torn, mixed up, and so on. The book is also inaccessible to health workers, nor to regional stakeholders (village heads, sub-district heads, heads of offices, heads of health centers, etc.).

The previous reference was only a guidebook, while in this study, it was designed in the form of an electronic child card. So that it is very easily accessible to the public. Innovation with the use of this electronic

child card is designed to be easily accessible by anyone, including the public, government officials, and officials. Parents or relatives who are far away can also monitor the growth of the baby/toddler using the Pin (Username and Password) on the electronic child card.

The background of the Android-based electronic children's card innovation is because people are very familiar with the use of Android. Data from the Ministry of Communication and Information of the Republic of Indonesia, in 2018 the level of internet users in Indonesia reached almost 50%. This is supported by the development of a rapidly growing technological infrastructure. As a smartphone user, Indonesia currently ranks 4th in the world (Dengan and Kembang, 2018) [4]. People are already familiar with technology such as computers, internet, smartphones, and other social media. The public is educated to use technology to help them in their daily activities and find information or as a repository of health data (Saurina *et al.*, 2015) [5].

In this study, the use of technology in the community is also used to monitor the growth and development of infants/toddlers, especially in an effort to reduce stunting rates. The government has made many efforts, disbursing large funds to tackle stunting in Indonesia. In the future, it is necessary to apply information technology that can have an impact on stunting improvement (Utami *et al.*, 2019) [6].

Stunting is a condition of growth failure in children under five caused by chronic malnutrition, especially in the first 1000 days of life (Abate *et al.*, 2020) [7]. As mentioned in the 2018 Riskesdas report, there are 30.8% or 7.3 million children in Indonesia experiencing stunting, with 19.3% or 4.6 million short children, and 11.5% or 2.6 million very short children (Manggala *et al.*, 2018) [8]. Based on the electronic community-based nutrition recording and reporting, on July 20, 2019, the prevalence of stunting under five in East Java was 36.81%.

The problem in this study is: How to monitor stunting in infants/toddlers using the electronic child card. In this study, an electronic-based child card will be designed, to monitor the potential for stunting through the development of a toddler child database

Methods

This is a qualitative descriptive study. The design in this study is a descriptive study with a Research and Development (R&D) approach (Sumasto *et al.*, 2021) [1]. This study develops a mother and child card that is currently used at the Integrated Service Center for child health. Research and Development (R&D) is a process or stage in developing a new

product or improvement of an existing one and can be accounted for (Nursalam, 2020) [6]. According to Nursalam (2020) [6], the research and development steps are as follows: 1. Literature study and data collection, 2. product development to be made, 3. trial or evaluation, 4. socialization and training/operational field testing and field trials, 5. final product revision, and 6. dissemination and recommendation.

Research variables: (1) Data on the health of children under five and (2) nutritional status of children under five (height, weight, age). The variables in this study were obtained through (1) mother of toddlers, (2) focus group discussion (FGD), and (3) expert consultation.

Result

Monitoring the nutritional status of children under five that has been used for a long time uses the mother and child health book. This book is always carried by the mother of the Integrated Toddler Service Center, Community Health Center, and other health facilities. This book is sometimes kept by officers at the Children's Integrated Service Center, aiming to minimize the risk of damage, loss, or forgetting.

The results of the researcher's evaluation were many parents of toddlers who did not pay attention to the contents in the book.

In the mother and child health book, there is an information about the health condition of the child, namely: The identity of the child's parents, birth history, health history, growth data, development data, and mental emotional development of the child.

In the maternal and child health book, to determine the nutritional status of toddlers, the indicators used are to compare weight with age, weight with height, height with age, and head circumference with age. Then, the results are plotted into a growth graph according to the gender. However, the book does not know the category of children's nutritional status. So that the conclusions are perceived by each according to the plotting of the colors in the graph. It means that people do not know the stunting status in the book.

In the 2020 edition of Maternal and Child Health, the indicators for early detection of growth deviations include:

- a. Weight/age; with the conclusion of the results (SK/K/N/RBBL)
- b. Weight/height, with the conclusion of the results (Gb, Gk, Gn, Gl, and O)
- c. Height/age with conclusion of results (SP, P, Tn, and TI)
- d. Head circumference/age with conclusion of results (Mi, N, and Ma).

It looks more complete, but there is no explanation of the abbreviations so that it confuses MCH book users, especially cadres and mothers of toddlers.

The evaluation results in accordance with the standard entirely (100%) are the identity of the child and parents, while the explanation of the indicators and criteria for the results of the early detection of growth deviations entirely (100%) does not meet the standard.

1. Recommendations from the FGD regarding the preparation of stunting monitoring instruments with electronic child cards include:
2. The identity of the child and mother/father/as a data base is adjusted according to the 2020 printed book on mother and child health
3. The application is made easy and simple but meaningful and does not burden the user
4. The results of monitoring the growth of girls and boys aged 0–5 years in the graphic application are distinguished between boys and girls
5. Displaying the overall measurement and weighing results for toddlers
6. Displays track record of measuring and weighing toddlers every month for comparison
7. Include the date of the month and year of the weighing/measurement
8. Determination of intervention from the conclusion of the weighing results.

Table 1 informs that the stunting monitoring content on the electronic child card according to participants was 52.5% very good and 47.5% good.

Table 1: Evaluation of stunting monitoring data content with electronic child cards

Content	Category				Total f (%)
	Very good (%)	Good	Less	Very less	
Child Identity	17 (56.7)	13 (43.3)	0 (0)	0 (0)	30 (100)
Parent's identity	16 (53.3)	14 (46.7)	0 (0)	0 (0)	30 (100)
Girls growth	16 (53.3)	14 (46.7)	0 (0)	0 (0)	30 (100)
Boy growth	16 (53.3)	14 (46.7)	0 (0)	0 (0)	30 (100)
Appearance	17 (56.7)	13 (43.3)	0 (0)	0 (0)	30 (100)
Benefit	15 (50)	15 (50)	0 (0)	0 (0)	30 (100)
Quality	15 (50)	15 (50)	0 (0)	0 (0)	30 (100)
Clarity	14 (46.7)	16 (53.3)	0 (0)	0 (0)	30 (100)
Average	15.75 (52.5)	14.25 (47.5)	0 (0)	0 (0)	30 (100)

Based on the recommendations from the FGD results and expert consultations, the form of the application for stunting monitoring with an electronic child card has been explained regarding: (1) Procedures for accessing the application; (2) application login; (3) enter data; (4) read data; (5) check the child's development; (6) add development data; and (7) add a new child.

Furthermore, the validity test was carried out using the Pearson product moment correlation. Meanwhile, the instrument reliability test was carried out based on the Cronbach Alpha scale on each valid instrument item.

1. The results of the validity and reliability of the child's identity. The child's identity was tested for validity using the product moment. All

questions were declared valid (r count > r table (0.266) and the significance value was <0.05). The results of Cronbach's Alpha reliability test all questions are reliable (value 0.871 because Cronbach's value > r table > 0.6)

2. The results of the validity and reliability of the identity of the mother/father/guardian,
3. The identity of the mother/father/guardian was tested for validity using the product moment. All questions were declared valid (r count > r table (0.266) and the significance value was < 0.05). The results of Cronbach's Alpha reliability test all questions are reliable with a value of 0.738 because Cronbach's value is > r table
4. The results of the validity and reliability test of girls' growth monitoring. Monitoring the growth of girls aged 0–5 years was tested for validity using the product moment. All questions were declared valid because (r count > r table (0.266) and the significance value was < 0.05). The results of Cronbach's Alpha reliability test all questions are reliable.
5. The results of the validity and reliability test of boys growth monitoring. Monitoring the growth of boys aged 0–5 years was tested for validity using the product moment. All questions were declared valid (r count > r table (0.266) and the significance value was < 0.05). The results of Cronbach's Alpha reliability test all questions are reliable with a value of 0.943.

Discussion

The results of the identification of toddler data needs, which will be used as a data base on electronic child cards (as stunting monitors) include: Toddler identities and parental identities, all of which are complete in accordance with the standards of the 2020 printed maternal and child health book.

Comparison with the previous reference is the existence of an application design in the form of an Android-based electronic child card. With this research, the risk of stunting can be known early by all interested parties.

It is a good thing to include the child's identity and the identity of the person on each card making, in the new regulation issued by the Ministry of Home Affairs. This decision is the Minister of Home Affairs Regulation (Permendagri) No. 2 of 2016 IA. This regulation is necessary because the child's identity in the maternal and child health book is made more complete than the birth certificate. The maternal and child health book contains addresses, blood types and nationality marks. Maternal and child health books can also be used as access to facilitate public services, such as: Taking care

of passports for children; open an account; family card; take care of population administration, or other needs.

In this study, to build a database, a complete identity of the child and parents is required. Because every parent of a toddler will get an identity card after filling out their respective data bases completely. There will appear the identity number of the parents, the card can be printed or stored on Android. With the electronic child card, every parent can monitor their child's growth independently at any time, without having to wait for a weighing schedule. The public can also see the history of their child's growth by simply entering the number on the electronic card. Thus, it is hoped that the incidence of stunting can be prevented as early as possible.

The electronic child card is arranged in a simple, clear, informative, and easy to use manner, because it is in accordance with the 2020 book on maternal and child health. Hence, it is no stranger to cadres and mothers of toddlers, because it has only been changed from a book format to an application format.

The hope is to reduce the incidence of stunting. The community can detect deviations in children's growth independently. Because it is connected to android, which currently almost all mothers of toddlers have android, it is very familiar. In addition, it can improve integration in providing services to children under five and complete documents in both reporting at the toddler service center, community health centers at the regional, provincial, and even national levels.

A good instrument is an instrument that has been tested for validity and reliability. Therefore, in the preparation process, it is very important to maintain the contents of the instrument whether it is able to measure what should be measured and the measurement results are able to provide accurate information.

The stunting monitoring instrument with an electronic child card has been tested for validity and reliability starting from the content, accuracy, format, ease of use, and timeliness.

So that it can provide end-user satisfaction of information systems. This is in accordance with the theory proposed by Doll and Torkzadeh (1988), who developed the EUCS instrument consisting of 12 items by comparing the traditional data processing environment with the end user computing environment, which includes five components: Content, accuracy, form (format), ease of use (ease of use), and timeliness (timeliness) to the satisfaction of end users of information systems.

The test results of the data base are valid and reliable, so that it is continued with the preparation of data according to the 2020 Maternal Child Health book, Minister of Health Regulation number 2 of 2020, the 2019 Early Development Intervention Detection Stimulation book, as well as research studies in the field. The research was conducted through FGD activities twice, with the aim of getting input related to toddler data that will be used as

a data base. This is to make it easier for users or those with an interest to monitor the growth data of children under five in their working area. The only way is to enter an account, then the features you want will appear. Thus, users just need to fill in and access the data easily through cellphone which can be done at any time.

The training is a means of preparation to improve the competence and skills of electronic child card users. The training method has several indicators as follows: (1) Interest which means interest in the use of a method, (2) harmonization of a training activity related to the continuity of activities in the field, (3) adequate space facilities, and (4) time compatibility with training participants.

The method of filling out the new electronic child card also needs to be explained because not all posyandu cadres and parents understand how to input data through electronic applications which are actually easy, efficient, and time-effective in filling out. How to input data according to the accounts available in the Karanel application, namely, accounts for parents, accounts for children's posyandu cadres, and accounts for community health centers.

The limitations/weaknesses of the research need to be tested more broadly so that application weaknesses can be identified immediately. This research has received ethical approval.

Conclusion

The purpose of this study was to produce an electronic child card design as the development of the 2020 child's maternal health book. Stunting monitors have been using the book on maternal and child health. The results of the evaluation of the indicators used to monitor the state are mostly in accordance with the book as a basic guideline for developing application systems. The data base compiled based on the book on maternal and child health, printed in 2020, Permenkes RI Number 2 of 2020 concerning Child Anthropometry Standards and Guidelines for Implementing Stimulation of Early Detection and Interventions for Child Growth and Development, written in 2019.

The electronic child card data base has met the requirements of a good instrument, namely, valid and reliable. Most of the participants' responses after the implementation of the socialization and training on the content and satisfaction of using electronic child cards said that they were very good, the accuracy of the data base, format, convenience and filling, timeliness, and data security was mostly good. Suggestions for further research can be developed more widely so that it can be used by all parties including the government.

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