USE AND ACCEPTANCE OF ELECTRONICS RECORDING AND REPORTING ON CHILD GROWTH MONITORING BY CADRE AT INTEGRATED HEALTH POST: A PILOT STUDY

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Abstract - The purpose of this study was to assess the use, acceptance, and barriers of electronics recording and reporting on child growth monitoring at integrated health post (in Indonesia: posyandu). Electronics recording and reporting systems (hereafter: e-PPGBM) are developed by the Directorate of Community Nutrition,MoH, Republic of Indonesia. A cross sectional design was used to obtain information that was conducted at 4 selected posyandu in Depok City in August 2017. Electronics recording and reporting was done by posyandu cadres who had attended the e-PPGBM training for 2 days. Information on adequate training, perceived ease of use, perceived usefulness, attitude about electronics recording and reporting usage were collected using a questionnaire adapted from Electronics Health Records (EHR).
The results of the study showed that almost all cadres in the posyandu agree that training on e-PPGBM will make it easier to use this technology, although there is 1 posyandu who said disagree. In term of perceived ease of e-PPGBM use, most cadres agreed, although there is cadre who say they do not agree that e-PPGBM is user friendly. And in term of perceived usefulness, most cadres said agree that e-PPGBM will help in her work, although some cadres disagree. Most of the barriers are lack of signal for mobile phone, lack of hardware/android mobile phone, time required to enter data, lack of incentives, lack of financial resources, and lack mobile phone skills.
As a conclusion in general e-PPGBM is well accepted and perceived as a tools which will make easier in recording dan reporting the nutritional status of children. But it still needs some improvements especiallyfor the connectivity and offline recording feature. Training and assistence in initial phase will improve the acceptance of e-PPGBM.

Keywords - Electronics recording and reporting, Growth monitoring, Under-five children, e-PPGBM, posyandu

I. INTRODUCTION

Ministry of Health (MoH), Republic of Indonesia has developed children growth monitoring for under-five children at integrated health post (in Indonesia: Posyandu). The Posyandu is heldmontly at the village to the community to monitor their child growth and also they can access immunization, antenatal care, family planning and diarrhea prevention.To carry out its activities, the posyandu is run by cadres with the support of the village authority, while for medical-related activities performed by the village midwife[1].
In addition to providing services in weighing and providing supplementary feeding for Posyandu visitors (under-fivechidren), the cadres must also provide regular reports on the implementation of activities that have been done. Cadre must fill out the register book after each service and then recap it for report[2].
During this time, recording and reporting is done manually by using posyandu registration book. Cadres should report regularly monthly to the village midwife or midwife coordinator at the primary health care at sub-district level and gradually report to higher levels such as to district health offices, province health offices and MoH at national level.Manually reporting process is not only expensive, but also has the opportunity to create errors and requires time-consuming. Each data will be re-entered manually into a computer or database so that will result in delays in delivering information quickly to the higher level. In addition, the territory of Indonesia is very wide and consists of thousands of islands that sometimes become obstacles in the delivery of reports to the national level, so the MoH is often difficult to get data quickly. To address it, since 2016 the MoH has been developing electronic recording and reporting (hereafter: e-PPGBM) using android applications on mobile phones that provide numerous advantages over use of traditional paper-based records such as low cost for a wider coverage and can be linked to contextual data using geographic information systems (GIS)[3]. However, user adoption is crucial in order for an EPPGBM to be beneficial. Cadre acceptance of an EPPGBM application will determine to overall success of a product's implementation[4]. Therefore, before being used on a large scale at national level, it is necessary to test in several locations in Indonesia such as Depok City. Thus, the purpose of this study was to assess the use, acceptance, and barriers of electronics recording and reporting on child growth monitoring by cadres at posyandu.

II. METHODS

Design

A qualitative approachwas used to obtain information on use, acceptance and barriers in implementing e-PPGBM that was conducted at 4 selected posyandu in

Depok City in August 2017 which 2 posyandu located border of Jakarta and other 2 posyandu located border of Bogor. Posyandu was chosen purposively with the criteria of number of under-five children more than 50 and the cadres quite cooperative.

Participants

Since this study was to test the e-PPGBM in the setting of posyandu, it was only 7 cadres from 4 posyandu who participate in this study. Before implementing the e-PPGBM, 8 cadres from 4 posyandu attended the training to operate the system. One cadre could not follow this study because of illness.

Data Collection

Data was collected by using structure questionnaire. Information on adequate training, perceived ease of use, perceived usefulness, attitude about electronics recording and reporting usage were collected using a questionnaire adapted from Electronics Health Records (EHR) using Likert Scale (which has been adjusted to the posyandu condition in Indonesia.

Four research assistants with Bachelor degrees in nutrition were trained for two days ahead before collecting data.

Data Analysis

Since the number of sample was very limited, then the data analysis only using descriptive approach.

III. RESULTS AND DISCUSSION

General information of android application on child growth monitoring

Electronics recording and reporting on child growth monitoring at posyandu (in Indonesia: e-PPGBM) is an application that handles infant record from child birth to 5years of age. This mainly includes monitoring child weight and height, exclusive breastfeeding and supplementary feeding that have been proven to improve child growth and health. The e-PPGBM enables providers to (Fig. 1-6):

1. Records child weight
2. Records child height
3. Register new child
4. Review exclusive breastfeeding
5. Record child supplementary feeding
6. Determine child nutritional status (WAZ, HAZ, WHZ)
7. Review trend of child growth
8. Record child who have severe underweight to be referred to health facilities

Fig 1. e-PPGBM view

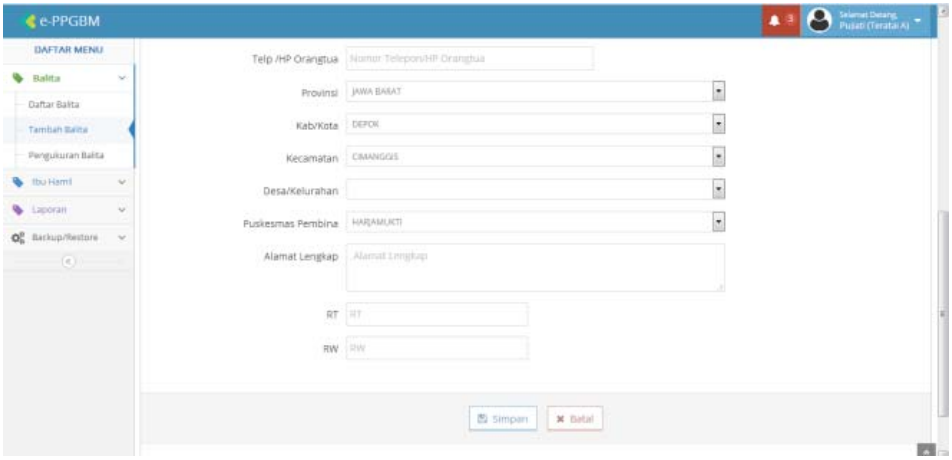

Fig 2. Register of under-five child

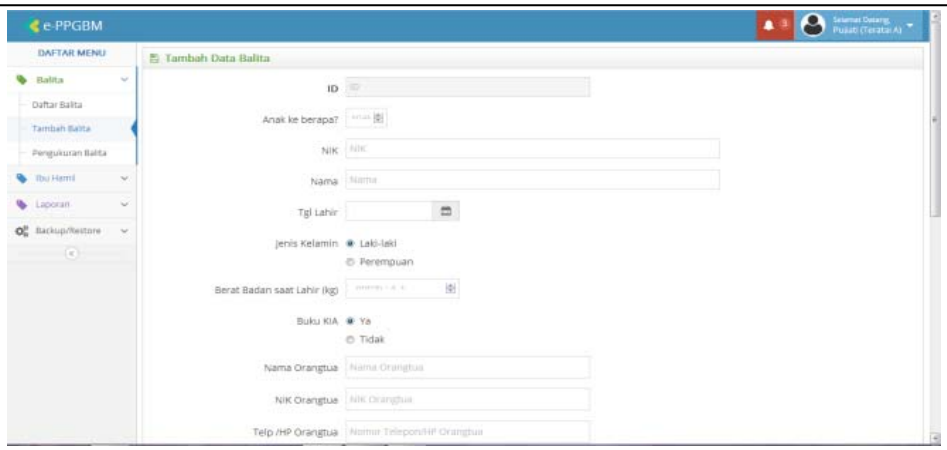

Fig 3. Entry of under-five child data

Fig 4. Information of child nutritional status

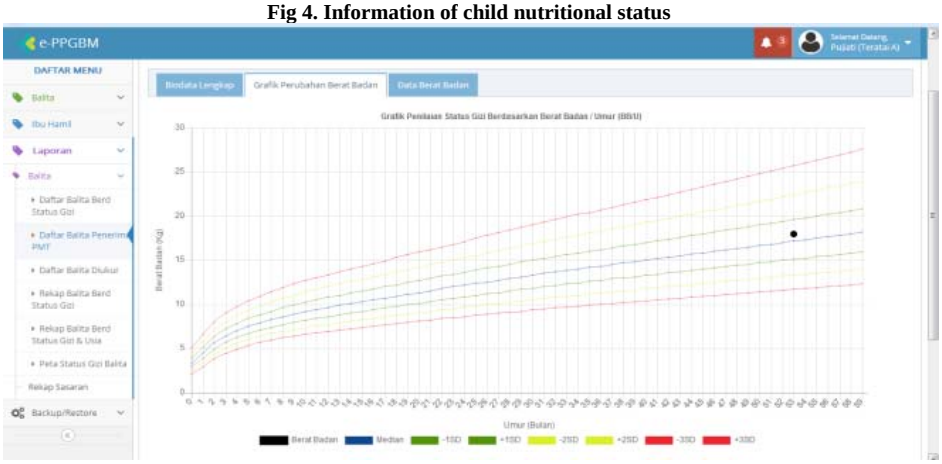

Fig 5. Child growth monitoring

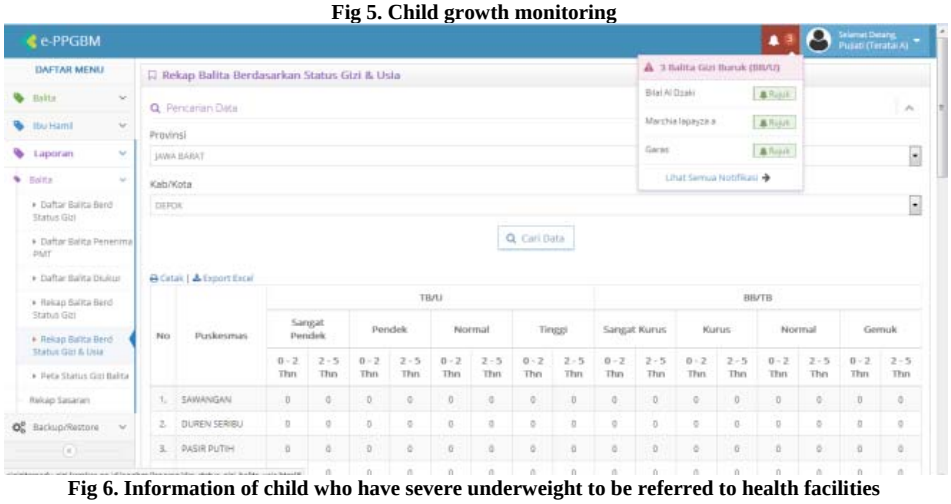

Fig 6. Information of child who have severe underweight to be referred to health facilities

Characteristic of cadres

Cadre is a volunteer people who willing to implement posyandu in their village. Seven out of 8 cadres who attended the e-PPGBM training was interviewed during this pilot study were mostly from senior high school, with average of 45 years old and 12 years on average become a cadre.

Adequate training

Before implementing the e-PPGBM, 8 cadres from 4 posyandu was trained by MoH and researchers for 2 days. Almost all cadres in the posyandu agree that training on e-PPGBM will make it easier to use this technology, although there is 1 posyandu who said disagree (table 1).

Perceived ease of use

Perceived ease of using e-PPGBM refers to the degree to which a person believes that using a particular system (in this case: e-PPGBM) would be free of effort[5]. In term of perceived ease of e-PPGBM use, most of cadres agree, although there is cadre who say they do not agree that e-PPGBM is user friendly (table 1).Possible reasons for disagree of use of electronic records systems is access to available of android mobile phone andthe cadre is not adept at using mobile phone such as research on electronic medicalrecords[6]. Study by Park, Y and Chen, JV (2007)[7]reveals that very few studies investigated the smartphone adoption in the healthcare sector.

Perceived usefulness

Perceived usefulness is defined as the degree to which a person believes that using a particular system (in this case: e-PPGBM) enhance her job performance[5]. Most cadres said agree that e-PPGBM will help in her work, although some cadres disagree.

Attitude about electronics recording and reporting usage

A user's perceived ease of use and perceived usefulness determine the user's attitude toward using the system. The results revealed that overall, the cadre attitude about e-PPGBM usage was positive, although some cadres still considered satisfied with reports using paper. This result was in line with research conducted byLaerum (2001)[5] sometimes it might be more convenient to use paper records.

Construct	Items	Posyandu			
		A	B	C	D
Adequate Training	The training I will receive on the e-PPGBM will be adequate.	3	3	3	3
	I will receive the training that I need to be able to understand and use the e-PPGBM.	4	3	3	3
	The e-PPGBM training will make it more useful to me.	3	3	4	3
	The e-PPGBM training will make it easier for me to use this technology.	3	3	2	3
Perceived Ease of Use	My interaction with the e-PPGBM will be clear and understandable.	3	2	2	3
	Learning to use the e-PPGBM will be easy for me.	3	3	3	3
	I expect to become skilled at using the e-PPGBM.	4	3	4	3
	Overall, I expect the e-PPGBM will be easy for cadres to use	4	3	3	3
Perceived Usefulness	Using the e-PPGBM will improve the quality of my work in providing better services.	3	2	2	3
	Using the e-PPGBM will allow me to accomplish tasks more quickly.	2	3	3	3
	Using the e-PPGBM will make my job easier to perform.	3	3	4	3
	Overall, the e-PPGBM should be a useful tool for practicing my profession	3	3	3	3
Attitude About e-PPGBM Usage	The development and implementation of the e-PPGBM technology will support the cadres in providing better service.	3	2	3	3
	I will encourage the use of the e-PPGBM among my colleagues.	4	3	3	3
	I need the e-PPGBM technology to provide effective service	4	3	3	3
	I am not satisfied with using the paper-based record in my job.	3	2	2	3

	All cadres should learn to use thee-PPGBM effectively.	4	3	3	3
	Overall, my attitude about e-PPGBM usage will be positive.	4	3	3	3

1: Strongly disagree, 2: Disagree, 3: Agree, 4: Strongly Agree

Barriers to adoption e-PPGBM

Table 2 showed that several barriers come up among cadres during implementing the e-PPGBM. Most of the barriers are lack of signal for mobile phone, lack of hardware/android mobile phone, time required to enter data, lack of incentives, lack of financial resources, and lack mobile phone skills. According to Taxonomy of Barriers to Electronic Medical Records[8] that consist of 8 categoriessuch as 1) financial, 2) technical, 3) time, 4) psychological, 5) social, 6) legal, 7) organizational, and 8) change process, the barriers found from e-PPGBM implementation only included in 4 categories namely 1) financial, 2) technical, 3) time and 4) change process. Workforce capacity is one of the most often technical skill that we must encountered in implementing electronic health information[9].

Aspects of the implementation process included time constraints[10]. Cadres needed around 10 minutes to entry child data. The difficulty in entering the data is to enter the registration number of the family as a child id, consisting of 16 digits.

Posyandu A	Posyandu B	Posyandu C	Posyandu D
Signal difficulty	Signal difficulty	Signals are often not smooth	Signals are often not smooth
Not all cadres have android mobile phone	Long loading, so needs funds for internet charges and time consuming	Long loading, so needs funds for internet charges and time consuming	Many advertisement, so that loading is long
Not all cadres want to learn	Difficulty entering an identity number	The app is hard to use	Not "user friendly" for the elderly and whose eyes are somewhat myopic

Table 2. Perceived Barriers to Implementing an e-PPGBM among cadres

CONCLUSION

E-ppgbm training makes it easier for cadres to apply e-PPGBM in posyandu. Cadre agrees to implement e-PPGBM in posyandu, although many things need to be improved. We recommend that the assistance to the cadres need to be done monthly for the first 3 months and the e-PPGBM Manual Book is created according to the latest feature development.

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