

Counseling and controlling child development based on information technology at fajar harapan infant and toddler orphanage

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ABSTRACT

The orphanage is the best place for neglected children to get services, education, skills to become quality and useful children for many people. To create all that, it is necessary to improve the quality of the Orphanage. The Fajar Harapan Infant and Toddler Orphanage is currently experiencing several problems, including: Monitoring child growth using only the Manual Towards Health Card (KMS), Lack of knowledge of caregivers about child growth and development, and lack of child health equipment. Based on the existing problems, the following solutions can be given: Designing child development applications; Provide counseling, training and guidance to caregivers related to children's growth and development and nutritional intake, as well as providing orphanage health equipment. From the results of Community Service activities that have been carried out, namely the availability of applications for monitoring web-based growth and development that can be accessed online, making it easier for caregivers to see the growth and development of their foster children and making it easier for administrators to monitor the growth and development of foster children. Availability of health equipment such as scales, height measuring instruments, head circumference measuring instruments, thermometers, mattresses, and first aid kits to support growth and development control. With the existence of growth and development counseling activities, it provides the benefit of increasing caregiver knowledge about child development and increasing caregiver skills in providing nutritional intake and providing stimulation to children so that children's health and growth and development improve better.

KEYWORDS

Orphanage;
Babies and Toddlers;
Child Growth;
Information Technology;
Application



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1. Introduction

Orphanage is a social institution that accommodates, educates and cares for orphans, orphans and neglected children, so that they get broad, appropriate and adequate opportunities for personality development, knowledge in accordance with expectations. The Fajar Harapan Baby and Toddler Orphanage is located at Jl. Mustafa Orphans No. 12 Pekanbaru under the auspices of the Bina Dhu'afa Foundation which was established in 2005, currently Fajar Harapan Infant and Toddler Orphanage has 68 children consisting of 5 babies under one year old, 19 toddlers aged 1-5 years and 44 people children aged over 5 years, while the orphanage has 9 caregivers shown in Fig. 1. The Fig. 1 shows that the orphanage is the best place for neglected children to get services, education, skills to become quality and useful children for many people. Child growth and development is something that is important to note so that early detection of growth deviations such as nutritional status, stunting, macro or microcephalic and normal can be carried out. In early detection of developmental deviations such as hearing and vision tests, early detection of emotional behavior disorders such as attention deficit disorders and hyperactivity, autism emotional behavior problems. From some of these early detections, caregivers in the orphanage should have knowledge about child growth and development so that if there are problems related to growth and development, they can be handled quickly. The problem that occurs at the Fajar Harapan Infant and Toddler Orphanage is the low knowledge of caregivers related to the knowledge of child growth

and development, caregivers still use parenting based on experience. Research on child growth has been carried out by previous researchers to become a literature review for this community service. Implications of the WASH Benefit Trial for Water and Sanitation – Authors' reply researched by Arnold [1]. Verrucosal hemangioma and histopathological differential diagnosis with angiokeratoma circumscriptum neviforme were studied by Oppermann [2]. Household milk production and child growth: Evidence from Bangladesh examined by Choudhury [3]. The determinant of the success of medical education for caregivers of children with congenital heart disease was studied by Azhar [4]. Enhanced nutritional exposure from conception to 2 years of age and risk of adult cardiometabolic disease: a modeling study investigated by Ford [5].

The inheritance of standard normality in pediatric nutrition research was investigated by Sandler [6]. Mapping of variation in child stunting, underweight and underweight in Indian states: The Global Burden of Disease Study 2000–2017 was studied by Hemalatha [7]. The need to use direct measures of child development was investigated by Fernald [8]. Metal and metalloid exposure among pregnant women from Spain: Levels and associated factors were investigated by Lozano [9]. A reduced metagenomic sequencing (RMS) approach to determine gut-associated phagomy in mother-child was studied by Manohar [10]. PM2.5-bound PAH exposure was associated with low plasma insulin-like growth factor 1 levels and decreased height in children studied by Zeng [11]. Events that have an impact on growth were investigated by Procianny [12]. The shared geographic spatial risk of childhood malnutrition in Malawi: Application of the shared spatial component model was investigated by Ngwira [13]. Using compositional data analysis to explore the accumulation of sedentary behavior, physical activity, and adolescent health was studied by Verswijveren [14]. The effect of changing the reference growth chart on the prevalence of short stature was investigated by Galdeano [15].

Prenatal thallium exposure and poor growth in early childhood: A prospective birth cohort study was investigated by Qi [16]. Parental and Child Factors Associated with Diet Quality of Children 2 to 6 Years Old in Finland was investigated by Koivuniemi [17]. Biochemical markers and anthropometric profiles of children enrolled in public day care centers were studied by Lourenção [18]. A comparison of nutrition education policies and programs for children in China and other selected developed countries was investigated by Cheng [19]. Effect of nutritional supplementation and home visits on growth and development in children in Madagascar: a randomized cluster-controlled trial studied by Galasso [20]. Implementation of a shared task psychosocial intervention for perinatal depression in South Africa: An evaluation of grounded theoretical processes researched by Davies [21]. The prevalence and determinants of malnutrition among primary school children in the haor district of Kishoreganj, Bangladesh were studied by Khanam [22]. An assessment of the core capacity of the Senegalese health system to provide Universal Health Coverage was investigated by Paul [23]. Impact of asthma and its treatment on growth: an evidence-based review researched by Zhang [24]. Exposure to nutrients and contaminants from smoked European anchovy (*Engraulis encrasicolus*): Its implications for the health of children in Ghana were studied by Hasselberg [25].

In addition, caregivers also have difficulty reading the Card Towards Health (KMS) given by the doctor because they do not understand the growth chart in the book. Meanwhile, for children aged over 1 year, it is very rare to see a doctor for growth and development checks to get health facilities, children are only allowed to grow and develop naturally, without seeing their growth and development according to their age. Growth has special characteristics such as changes in size, proportion, loss of old characteristics and the emergence of new characteristics, growth has a different speed in each age group and each organ also grows with different proportions. There are 3 periods of rapid growth, namely the fetal period, the 0-1 year infancy and the puberty period. While the development process occurs simultaneously with growth, so that every growth is accompanied by changes in function. Development is the result of the interaction

of the maturation of the central nervous system with the organs it affects. Early development includes functional abilities, namely cognitive, motor, emotional, social and language.

Cards to health have been researched by previous researchers and used for community service references. Canadian report card on health equity across the life course: Analysis of time trends and cross-country comparisons with the UK studied by Blair [26]. Guanabara Bay ecosystem health report card: Science, management, and governance implications researched by Fries [27]. The development of a soil health card for efficient soil management in Haryana, India was investigated by Purakayastha [28]. CORNET Card Study #1: Do You See What I See? Providers' Confidence in Caring for Children with Special Health Care Needs was investigated by Braganza [29]. Incorporating fish recruitment indicators into health report cards: A case study from Gladstone Harbour, Australia researched by Sawynok [30]. Inferring transit-based health search patterns from smart card data – A case study in Beijing, China investigated by Du [31]. Prevalence of marijuana use, distraction, and possession of a medical card in US military veterans: Results from the 2019–2020 National Health and Resilience Study in Veterans studied by Hill [32]. Promoting a learning health system feedback loop: Experience with a practice-based VA research network card study was researched by Golden [33]. A Bayesian approach to sample size determination, illustrated by the Andhra Pradesh (India) Soil Health Card data studied by Brus [34].



Fig. 1. Photo together with partners

The process of monitoring growth at the Orphanage is that every examination and the results of measuring head circumference, weight, and height are recorded in Card Towards Healthy, a chart is provided for healthy growth, a graph is provided that shows whether the child's growth is normal or not, and all of this is done by the doctor, while the caregiver do not understand how to read growth charts, doctors can only see the growth charts when children and caregivers come directly to the hospital to get services such as administering vaccines as well as for child development. In seeing the development of children, less attention is paid to the lack of knowledge of caregivers in terms of good growth and development for children. The large number of children whose growth and development will be monitored is also a problem by only monitoring based on the graphs in the Card Towards Health.

There are 9 caregivers at the Fajar Harapan Orphanage with an age range of over 40 years. In caring for children at the orphanage, they apply parenting styles based on their experience, while the knowledge of growth and development possessed by caregivers is still very low. Like not understanding the usefulness

of measuring head circumference every month, how to stimulate children who are late in their development such as late speaking, late walking, and other growth and development. Abnormal growth and development of toddlers is more common in toddlers who have mothers with less knowledge of growth and development compared to toddlers who have mothers with good knowledge levels.

The contribution given to overcome the above problems is the creation of applications that are easily accessible by the orphanage in order to know and monitor the growth and development of their foster children in a computerized manner. This application will later store data on the growth and development of children like (KMS) Towards Healthy cards into the database. So that caregivers have more knowledge related to children's growth and development, in this application several videos and explanations will be given so that foster mothers can practice directly by following the videos and modules in the application, this way will also improve the skills of caregivers to stimulate growth child development at the Fajar Harapan Infant and Toddler Orphanage. Another solution is to provide counseling, training and guidance related to child growth and development to caregivers at the Fajar Harapan Infant & Toddler Orphanage directly so that caregivers' knowledge increases, so that foster children grow and develop properly as expected. This counseling, training and guidance in addition to adding knowledge to caregivers will also improve the skills of caregivers in stimulating children's growth and development. The counseling, training and guidance held will involve pediatricians and nutritionists.

2. Method

Activity Implementation Methods are steps or stages that will systematically be used in the implementation and completion of the solutions provided to resolve the problems experienced by partners, whose partners are the Fajar Harapan Infant and Toddler Orphanage shown in Fig. 2. The Fig. 2 shows that the method that the proposer uses consists of stages of design, implementation, counseling, training, guidance and evaluation. The method of implementing this activity focuses on the healthy and information technology.



Fig. 2. Method of implementation of pkm activities

Description Justifications for the proposing team and partners in determining the agreed problems to be resolved during the implementation of PKM activities are as follows:

2.1. Child Development Application Design Stage

The design stages used in making child development applications shown in Fig. 3.



Fig. 3. System development method

The picture shows that explanation:

- **Planning**

At this stage the proposer identifies and prioritizes what information system will be created to solve partner problems, the targets to be achieved, the implementation period and consider the available funds.

- **Analysis**

At this stage is to analyze existing problems, opportunities, obstacles that occur and the needs expected by partners so that improvements can be proposed.

- **Design**

The design stage is to meet the needs in the analysis phase where this design is useful to provide an overview of the system to be made. The design here is to describe the application of child development at the Fajar Harapan Infant & Toddler Orphanage.

- **Implementation**

The implementation stage is to prepare all the device installation needs so that the system and its applications can be used, such as the preparation of hardware, software and other supporting facilities. After everything is ready, training can be carried out for all parties so that they can understand how to use the application for child development.

- **System Usage**

After the implementation stage is carried out, then the growth and development application is ready to be used to help the Fajar Harapan Infant and Toddler Orphanage.

2.2. Implementation Stage

The implementation stages consist of:

- Implementation of the administrative information system at the orphanage to be used in the administrative recapitulation of the orphanage.
- Implementation of the child development application to be used by caregivers, and caretakers of the orphanage, with this application caregivers and administrators will find it easier to monitor the growth and development of children at the Fajar Harapan Baby & Toddler Orphanage.
- Submit supporting equipment for child development and health such as scales, height measuring instruments, head circumference measuring instruments, thermometers, mattresses, and first aid kits.

2.3. Counseling, Training and Guidance Stage

At the stage of counseling, training and guidance there are 2 stages, namely in terms of children's growth and development and in terms of technology.

- **The stage of counseling, training and guidance for children's growth and development**

At this stage, the first counseling will be held using the lecture and discussion method, the counseling will be carried out by a pediatrician and will be assisted by member 2 who does have a field of expertise in Public Health. After the counseling, there will be training and guidance for caregivers so that caregivers can better understand and practice it immediately. This stage will be very useful for caregivers in increasing knowledge and skills related to child growth and development.

- **Training on the use of administrative information systems and child development applications**

At this stage, training on the use of the system that has been completed will be carried out, so that the orphanage manager can use the system to assist in managing the administration of the orphanage and monitoring the growth and development of children.

2.4. Evaluation

The evaluation stages consist of:

- After this PKM activity is completed, the proposing team will evaluate by measuring the effectiveness and efficiency of using the system and application. Measurements will be made to the users of the administrative information system and child development applications, namely the administration, administrators, and caregivers at the Fajar Harpan Infant and Toddler Orphanage.
- The proposing team will conduct a quantitative analysis of the knowledge of caregivers and the level of growth and development of children in the Orphanage, so that the results of the activities will be able to increase the knowledge and skills of children's growth and development, and this activity will be able to improve the child's growth and development well.
- Sustainability Cooperation with partners will continue after PKM activities, such as participating in observing the growth and development of children at the Orphanage, maintaining the system if bugs are found or need to update the features of the system, as well as making donations to the children in the orphanage.

3. Results and Discussion

3.1. Application Design Growth

In making the application for child development, it will first analyze all the needs so that what features are needed in using the system. This application will later be useful for caregivers in recording child growth and development and viewing children's growth and development tables through the application, besides that caregivers can also view videos and modules in the application to increase their knowledge and skills in improving children's growth and development.

The following is a child development application model that will be built shown in Fig. 4. In the child data menu, the user will enter the date, month and year of birth, then the application will display the current age. Furthermore, the user uses the growth menu by entering the child's weight, child's height and head circumference, then the application will output data in tabular form and notify the user of the child's position in the table as normal or not, this message will greatly help foster mothers as one of the users in reading the table. The appearance of the application that has been built can be seen in the following Fig. 5.

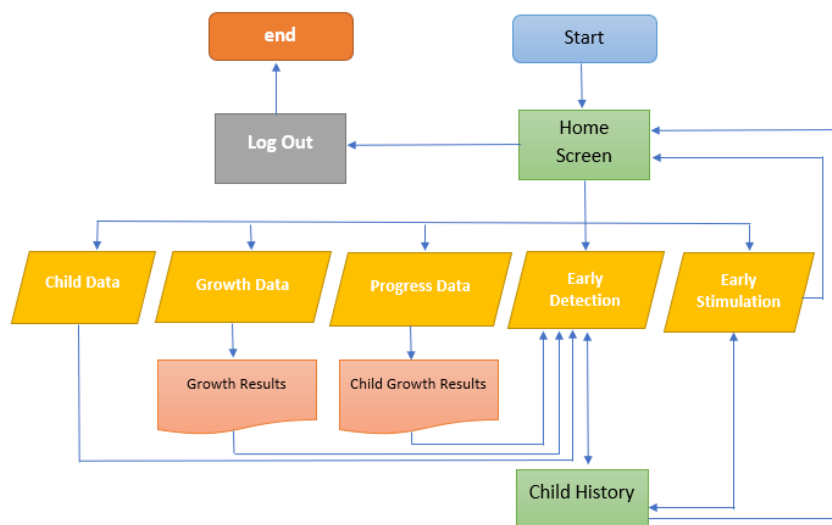


Fig. 4. Application structure for infant and toddler development

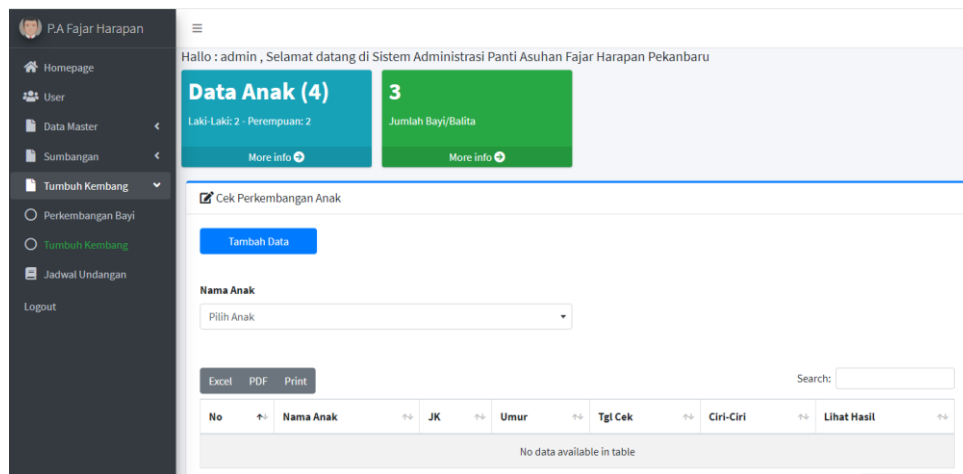


Fig. 5. Display of the growth menu application

When selecting the growth and development menu, the system will show the baby development and growth menu options. To input children's data, it can be done through the Foster Children's Data master data menu shown in Fig. 6.

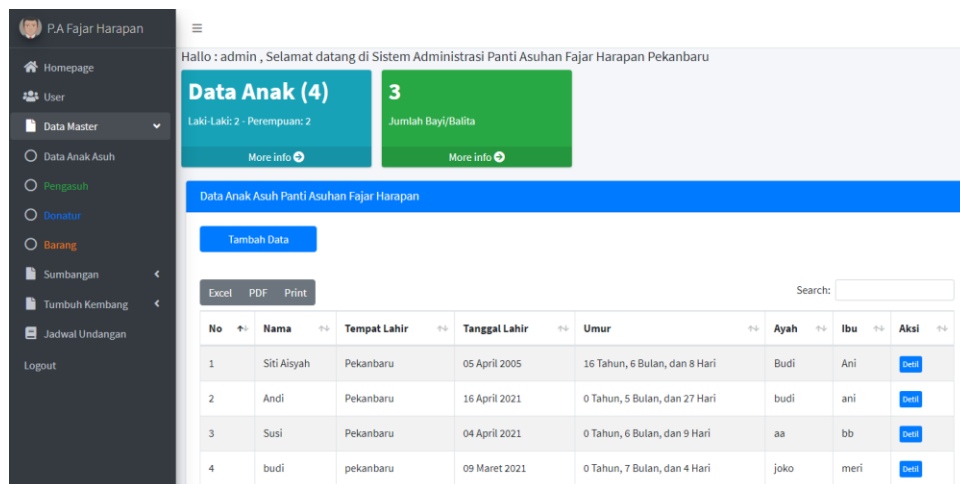


Fig. 6. Display of the list of foster children

To enter data on child development, click the Add Data button, and choose the name of the child whose activities will be entered, then select the checklist for activities that the child can already do shown in Fig. 7.

Hallo : admin , Selamat datang di Sistem Administrasi Panti Asuhan Fajar Harapan Pekanbaru

Data Anak (4)
 Laki-Laki: 2 - Perempuan: 2
 More info

3
 Jumlah Bayi/Balita
 More info

Monitoring Perkembangan Anak

Anak
 Pilih Anak

Nama Anak
 Andi

JK
 Laki-Laki

Umur
 0 Tahun, 5 Bulan, dan 27 Hari

Pilih Kegiatan yang sudah bisa dilakukan Oleh Anak :

- ☐ Mengangkat kepala tegak ketika tengkurap
- ☐ Tertawa
- ☐ Menggerakkan kepala ke kiri dan ke kanan
- ☐ Membalas tersenyum ketika diajak berbicara/ tersenyum
- ☐ Mengoceh spontan atau bereaksi dengan mengoceh

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Fig. 7. Display of the child development monitoring input form

To see the nutritional status of the child, please select the name of the child, and the nutritional status will automatically appear shown in Fig. 8. The picture shows that the system automatically displays Nutritional status based on weight/age, height/age, and weight/height based on age, height, weight and head circumference.

Hallo : admin , Selamat datang di Sistem Administrasi Panti Asuhan Fajar Harapan Pekanbaru

Data Anak (4)
 Laki-Laki: 2 - Perempuan: 2
 More info

3
 Jumlah Bayi/Balita
 More info

Tumbuh Kembang Anak

Tambah Data

Nama Anak
 Pilih Anak

No	Nama Anak	JK	Umur	Panjang Badan	Berat Badan	Lingkar Kepala	Tgl Catat	Status Gizi (BB/U)	Status Gizi (TB/U)	Status Gizi (BB/TB)
1	Andi	Laki-Laki	0 Bulan	2,5	30,5	2,8	2021-04-30	Gizi Lebih	Sangat Pendek	BB/TB

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Fig. 8. Display of child growth status



Fig. 9. Socialization of child development applications with partners

The application for growth and development has been submitted to the orphanage and socialization has been held on how to use the application online, which was attended by 3 caregivers shown in Fig. 9. The Fig. 9 shows that the application can be accessed via the link: project.htp.ac.id/pkm/administrator.

3.2. Counseling for Child Development

Counseling using the lecture and discussion method, is carried out by nutritionists and children and will be assisted by 2 people who do have expertise in Public Health. After the counseling, there will be training and guidance for caregivers so that caregivers can better understand and practice it immediately. This stage will be very useful for caregivers in increasing knowledge and skills related to child growth and development.

At the stage of counseling, training and guidance have been completed and there are 2 extension activities, namely:

3.2.1. Counseling on Growth and Development of Babies and Toddlers at Fajar Harapan Orphanage

The counseling activity on the growth and development of infants and toddlers has been completed with the presenter, Mrs. Een Husanah, A.Md. Keb, SKM, M.Kes, the activity was carried out through a zoom meeting platform and was attended by 7 caregivers at the Orphanage shown in Fig. 10.



Fig. 10. Presentation of growth and development counseling materials via zoom meeting

The presenter explained about the future of a nation depending on the success of children in achieving optimal growth and development shown in Fig. 11. The picture shows that good and sufficient nutrition, good health status, proper parenting, and proper stimulation will help children to grow up healthy and able to achieve optimal abilities.



Fig. 11. Participants in counseling activities from the orphanage

3.2.2. Counseling on Nutrition Intake to Improve Nutritional Status in Infants and Toddlers

The counseling activity has been completed by inviting nutritionists, Ms. Seftina Ningsih D, A, A.Md. Gz from Zainab Hospital Pekanbaru uses a zoom meeting platform shown in Fig. 12.

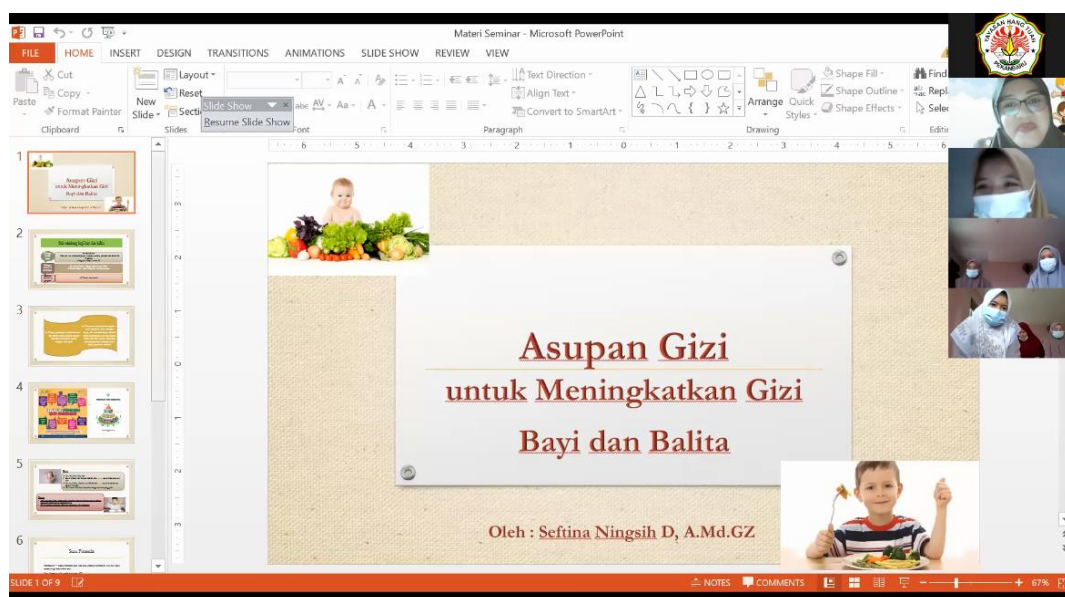


Fig. 12. Presentation of nutrition improvement counseling materials via zoom meeting

In this counseling, the resource persons explain about balanced nutrition guidelines that are relevant in today's life, and it is hoped that the caregivers can apply what is stated in the general balanced nutrition guidelines shown in Fig. 13.



Fig. 13. Participants in counseling activities via zoom meeting

The results of these 2 outreach activities are increasing caregiver knowledge about child development and increasing caregiver skills in providing stimulation to children so that children's health, growth and development improves better shown in Fig. 14.



Fig. 14. Handing over of medical equipment by the orphanage

Health Equipment is an important part to support health and child growth. The solution given is related to the lack of children's health equipment, namely by providing health equipment and for child growth and development such as scales, height measuring devices, head circumference measuring

instruments, thermometers and first aid kits. The provision of mattresses is also considered important considering the increasing number of children being cared for every year.

4. Conclusion

The conclusion of Community Service activities at the Fajar Harapan Infant and Toddler Orphanage is the availability of applications that can monitor baby growth, namely web-based child development applications, making it easier for caregivers to see the growth and development of their foster children and making it easier for administrators to monitor the growth and development of foster children. is at the Fajar Harapan Infant and Toddler Orphanage. With the existence of growth and development counseling activities, it provides the benefit of increasing caregiver knowledge about child development and increasing caregiver skills in providing nutritional intake and providing stimulation to children so that children's health and growth and development improve better. Availability of health equipment such as scales, height measuring instruments, head circumference measuring instruments, thermometers, mattresses, and first aid kits to support growth and development control.

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Author Contribution

All authors contributed equally to the main contributor to this paper. All authors have read and agreed to the published version of the manuscript.

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Conflict of Interest

The authors declare no conflict of interest.

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