



Empowering Cadres in the Practice of Infant and Child Feeding Improve Nutritional Status of Children

Ratnawati*, Riana Pangestu Utami, Astri Ayu Novaria

Department of Nutrition, Health Polytechnic of East Kalimantan, Jl. Kurnia Makmur No. 64, Samarinda, East Kalimantan 75243, Indonesia

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Abstract

Community-based interventions are necessary to reduce the number of children under five who experience weight faltering, underweight, and wasting in the Mesjid subdistrict of Samarinda City to prevent them from developing stunting. This activity aimed to train health cadres in Infant and Young Child Feeding (IYCF) and provide supplementary food based on local foods to children under five with nutritional problems. The activity was conducted in two stages: the first was IYCF training for cadres with a total of 63 participants, and the second was providing supplementary food to 28 target children. The activities were evaluated using knowledge questionnaires for the cadres and weight measurements after one week of supplementary feeding interventions and IYCF education for the children. The results of the community service showed an increase in cadre knowledge related to IYCF, with the majority previously in the poor category (60.3%) improving to a majority in the adequate category (65.1%) after the training. There was also an increase in the weight of children who received local food-based supplementary feeding, with the average weight increasing from 10.15 kg in the pretest to 10.54 kg in the posttest. This activity proved beneficial in improving the knowledge of cadres and the weight of children, and it is hoped that the subdistrict, health centers, and cadres will commit to being responsible for monitoring and evaluating the sustainability of the activities.

*Corresponding Author

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Ratnawati

E-mail: ratna845@gmail.com

INTRODUCTION

Malnutrition in the early stages of life has been proven to have significant negative effects. The earlier a child experiences malnutrition, the higher the risk of poor learning outcomes (Maryam et al., 2022). In 2022, approximately 22.3% of children under the age of 5 worldwide (148 million) were impacted by stunting, a decrease from 24.6% in 2015 and 26.3% in 2012, the baseline year for World Health Organization (WHO) nutrition targets. If current trends continue, it is projected that 1 in 5 children under 5 years old (19.5%) will suffer from stunting by 2030. Additionally, 37.0 million children under 5 (or 5.6%) were affected by being overweight, and 45 million children (or 6.8%) were affected by wasting (United Nation, 2024).

The third point of the Sustainable Development Goals (SDGs) is to ensure healthy lives and promote well-being for all ages. One of the actions under this goal, as outlined in the UN's policy actions led by

WHO and the Food and Agriculture Organization (FAO), is to create sustainability and develop resilient food systems for healthy diets. The utilization of local food to address underweight problems supports this point.

Mesjid Subdistrict is an area where the achievement of children under five who gained weight out of the total weighed is only 25%, according to data from February 2023. Data from *Elektronik Pencatatan dan Pelaporan Gizi Berbasis Masyarakat* (e-PPGBM) identified 19 children under five in Mesjid Subdistrict with very low weight and 39 with low weight, the highest compared to the other two subdistricts within the Mangkupalas Health Center's working area. Moreover, height measurements from February 2023 showed that 16 children under five were classified as severely stunted, and 42 were stunted in the Mesjid Subdistrict, again the highest among the three subdistricts. These results align with the nutritional status of children under five according to their weight

for height, which shows that Mesjid Subdistrict had the highest number of children with under-nutrition (20 children) and severe undernutrition (9 children) (Puskesmas Mangkupalas, 2024). A study by Ratnawati & Satriani (2024) revealed that the nutrient intake of underweight children in the Mangkupalas Health Center area was mostly below the Nutritional Adequacy Rate (AKG), with an average energy intake of 793 kcal compared to the AKG of 1350 kcal, sourced from breast milk and complementary foods.

The data collected for knowledge and skills analysis involved 30 cadres, and only 11 cadres received materials related to infant and young child feeding (IYCF). However, despite receiving IYCF-related training, most cadres' knowledge levels remained low (41.2%) or fair (52.9%). Only one cadre (5.9%) had a good knowledge level.

Some research findings suggest a connection between the role of Posyandu cadres and the improvement of toddlers' nutritional status. Cadres play a key role in carrying out Posyandu activities. Their involvement and active participation are expected to encourage greater community engagement (Aridi et al., 2021). The role of cadres as motivators helps enhance the quality of *Pos Pelayanan Terpadu* (Posyandu), particularly in addressing health issues. They are responsible for carrying out Posyandu activities and encouraging maternal participation. Cadres are also tasked with completing the *Kartu Menuju Sehat* (KMS) for toddlers, which is crucial for accurately tracking their growth and development (Surmita et al., 2023). Proper and thorough KMS documentation is essential for providing accurate information on toddler development. Without sufficient involvement from cadres, the monitoring of toddler growth and development could suffer. Cadres also play a crucial role in implementing the local supplementary feeding program. Cadres are expected to be capable of preparing local supplementary food within Posyandu activities and also in the recovery supplementary feeding program using local food.

It is recommended that local food ingredients be used for supplementary feeding to ensure that its success is not reliant on food supplies from outside the region. This approach helps to make the program more sustainable and ensures its continued implementation (Maryam et al., 2022). The availability of animal and plant-based foodstuffs in the Mangkupalas Health Center area is well established, and access to food is relatively easy due to the strategically located and accessible market. Residents can meet their food consumption needs with self-produced agricultural products or purchases from nearby markets.

The proposed solution to undernutrition includes training in the Practice of Infant and Child Feeding and providing supplementary feeding with local

food to wasting, underweight, and weight-faltering children. Providing supplementary feeding with local food for children with nutritional problems is intended to help improve their nutritional status.

MATERIALS AND METHODS

Materials

The materials used in this program are the Training Module for Cadres in IYCF and the Provision of Local Supplementary Food. The local food menu consists of one full menu and one snack. The energy ranges from 175 kcal to 300 kcal, and the protein ranges from 8g to 16g. The nutritional value is in accordance with the technical guidelines for local supplementary feeding for toddlers (Kementerian Kesehatan, 2023).

Methods

The method used in this community service program is Experiential Learning. This approach focuses on learning through direct experiences and reflections, helping participants understand concepts better and develop practical skills in real-life situations. This community service activity targeted cadres and undernourished children under five who were the beneficiaries of supplementary feeding (PMT). The activities were carried out in three stages: preparation, implementation, monitoring, and evaluation.

During the preparation stage, permission for the activities was obtained from the Mangkupalas Community Health Center and Mesjid ward, followed by meetings with the team and target partners. The following steps included creating training modules for health cadres and recipes for local supplementary food, preparing the training schedule, and planning to provide local supplementary food for malnourished children.

In the implementation stage, there were two activities: the first was training cadres on complementary feeding and monitoring toddler growth, which was held on July 9, 2024. Training posyandu cadres is vital in promoting proper supplementary feeding practices among mothers (Sudiarti et al., 2022). Therefore, a cadre training program that enhances their skills and motivation in implementing effective Infant and Young Child Feeding (IYCF) practices is essential. Posyandu cadres should be knowledgeable about exclusive breastfeeding, supplementary feeding, child growth monitoring, and counseling. Well-trained cadres are key to the success of IYCF programs, as they empower mothers, boost family support, and improve the quality of meals for infants and children, all of which contribute to better nutritional outcomes in toddlers (Ekayanthi et al., 2022). Nutritionists, the maternal and child health program manager from Mangkupalas Health Center, the village head, and the cadres attended

the event. There were 63 cadres divided into three small classes. The material was delivered through discussion and practice by the community service team. The second activity was distributing local supplementary food to 28 toddlers aged 6-59 months who had not gained weight, were underweight, or were experiencing wasting. This activity began with screening the target children from August 12 to 22, 2024. The menu provided consisted of one full meal and one snack. The supplementary food was distributed directly to the target homes. This distribution was also accompanied by nutritional education for the mothers and caregivers of the children (Sriwiyanti et al., 2023).

The third stage was monitoring and evaluation. The evaluation of the volunteer training was conducted using pre-tests and post-tests on the day of the event, while the supplementary food provision activity was evaluated through the toddlers' weight changes (Ariesthi et al., 2021).

RESULTS AND DISCUSSION

Cadres Training for Infant and Young Child Feeding and Growth Monitoring

The cadre training was conducted using discussion and practical methods in small groups of 12-13 cadres, involving one facilitator from the community service team and two Nutrition Department Health Polytechnic students of East Kalimantan as field team members. The first topic covered was the principles of balanced nutrition and appropriate infant and child feeding based on age, frequency, amount, texture, variety, responsive feeding, and hygiene. The second topic focused on growth monitoring, where cadres were trained to calculate toddlers' ages and fill out the growth monitoring card (KMS) using case study practical methods (Fig.1).



Fig. 1. The training cadres activities

Based on the pretest results from 63 participants, 25 cadres (39.68%) had adequate knowledge, and 38 cadres (60.32%) had poor knowledge. Based on the post-test results, 14 people (22.2%) had good

knowledge, 41 people (65.1%) had adequate knowledge, and 8 people (12.7%) had poor knowledge.

Based on comparing pretest and post-test results to observe changes in knowledge level, the data show an improvement in the cadres' knowledge after receiving education (Table 1). The increase in knowledge is evident from the "good" category, which previously had no cadres with knowledge in this category, now showing 14 cadres (22.2%). Additionally, there was an increase in the "adequate" knowledge category from 25 people to 41 cadres (65.1%).

Table 1. Pre-test and post-test results of cadres knowledge level

Knowledge	Pre-test		Post-test	
	n	%	n	%
Good	0	0	14	22.2
Adequate	25	39.7	41	65.1
Poor	38	60.3	8	12.7
Total	63	100	63	100

The health education delivered by the community service team drives the improvement in knowledge among health cadres and the community. The media and learning methods used also impact the increase in cadres' knowledge. The media offers guidance on the suitable frequency, quantity, texture, and variety of complementary feeding for children based on their age (Muharyani et al., 2023). The discussion method allows participants to ask challenging questions easily and helps educators assess students' depth of understanding of the discussed topic (Martha et al., 2020). The practice involves demonstrating objects to perform a task. Based on the community service results conducted with cadres in Mangkupalas Community Health Centre, it can be concluded that there was an improvement in the cadres' knowledge, mainly in the "adequate" category. This improvement was achieved through education on proper infant and child feeding. With this enhanced capacity, the cadres can now provide education to mothers of toddlers in the area.

Based on the assessment results, most cadres still do not understand how to calculate age in the KMS using full months. Cadres reported that KMS is always filled out based on the month of weighing without considering the child's age. Additionally, some cadres are still unable to correctly fill out the status of "Gained" and "Not Gained" on the KMS while considering the minimum weight gain (KBM). Cadres mentioned that they had received some of this information in other training sessions, but over time and due to a heavy workload, they had forgotten some of the material. This training becomes helpful

because the role of cadres as educators is crucial for enhancing mothers' understanding of toddler development and nutrition. Cadres can, for example, interpret the KMS data for each toddler, explain the child's condition based on the weight gain data shown in the KMS graph, facilitate group discussions with mothers, and conduct home visits. However, the post-test results also revealed that some cadres still fall into sufficient and inadequate knowledge categories. This variation may be explained by differences in cognitive attentional capacity and fluctuations in focus among participants (Muharyani *et al.*, 2023).

Therefore, the effectiveness of cadres significantly impacts children's nutritional status. The more proficient the cadres, the higher the likelihood of improved nutrition in toddlers, enhancing the quality of Posyandu services, especially in addressing toddler health issues. It can lead to quicker malnutrition resolution through prevention and prompt intervention. Additionally, effective cadres tend to inspire mothers to focus on improving their children's nutrition and encourage them to regularly bring their toddlers to Posyandu for health monitoring (Aridi *et al.*, 2021).

In the material related to IYCF, cadres still lack understanding regarding the principles of quantity, variety, and responsive feeding. Cadres need further reinforcement on the portions of complementary feeding and supplementary food currently being the government programs. Experienced Posyandu cadres are essential for the success of IYCF, as they enhance maternal empowerment, strengthen family support, and improve the quality of feeding for babies and children, thereby boosting toddlers' nutritional status (Ekayanthi *et al.*, 2022).

Provision of Local Supplementary Food For Malnourished Children

The provision of local-based supplementary food is carried out in several stages. Anthropometric screening, including weight, height or length measurements, and nutritional status assessment, is performed at the beginning of the activity. The screening results identified 28 toddlers who met the local supplementary feeding program criteria, including at least one of the following criteria: 1) no weight gain, 2) underweight, or 3) wasting. The target toddlers then received a full meal and a snack, each once a week. The provided menu includes Nasi Uduk for the full meal and fish fingers for the snack (Table 2).

The menus provided are adjusted according to the toddlers' ages and adhere to the principles of balanced nutrition using local foods available in the area. The team and cadres distribute the menus, and during implementation, the supplementary food provision is accompanied by nutritional education

related to infant and child feeding and growth monitoring. Increasing a mother's knowledge about supplementary feeding for toddlers improves her ability to prepare nutritious food for her babies and toddlers, leading to better overall health care for young children through balanced and nutritious meals (Sriwiyanti *et al.*, 2023). Food intake interviews are conducted three times a week by the community service team, and the final evaluation is performed by weighing the toddlers at a one-week interval from the initial screening (Fig. 2)

Table 2. The local food menu composition for toddlers

Menu	Ingredients	Portion (g)			Energy (kcal)	Protein (g)
		6-11	11-23	24-59		
Nasi Uduk	Nasi Uduk	40	50	75	179-290	9-15
	Shredded chicken	20	25	30		
	Omelette	15	25	25		
	Stir-fried tempeh	10	25	25		
	Vegetable	20	20	30		
Fish Finger	Fish Finger	75	100	125	195-325	7.5-12.5



Fig.2. The provision of local food to targeted toddlers

Based on the initial weight measurement, the average weight was 10.15 kg, and after the provision of supplementary feeding, the final weight

measurement showed an average of 10.54 kg. It indicates an average weight gain of 0.39 kg or 390g in 1 week (Fig. 3). This indicates that giving local menu as supplementary feeding combined with education can increase the body weight. It is similar to Aini et al. (2023) and Warisyu et al. (2024) that offering additional food made from local ingredients, including a snack menu based on for 3 months, had a notable impact on changes in weight gain and nutritional status as measured by body weight for age (WAZ). Consuming adequate complementary and daily foods supports children's growth, health, and development. The WHO recommends introducing foods at the right time that are sufficiently nutritious, suitable, and safe for all children (Ariesthi et al., 2021).

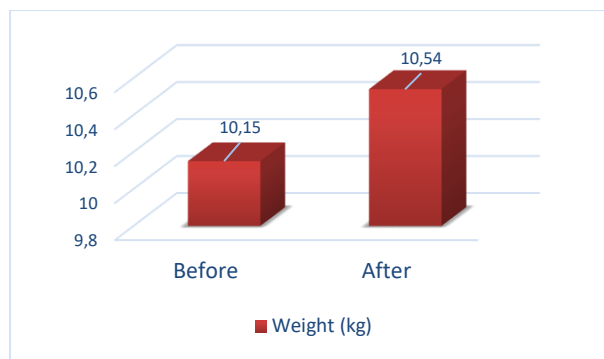


Fig. 3. Weight changes in children after local food supplementation

A varied diet is crucial for meeting children's nutritional needs; incorporating animal-based foods (Aini et al., 2023), fruits, and vegetables rich in vitamin A into the daily diet, or as frequently as possible, is important. While the recommendations for fulfilling children's nutritional needs are generally consistent across countries, they are particularly emphasized in low-income developing nations that face higher child malnutrition rates and limited resources (Gewa & Leslie, 2015). Previously, the government had implemented a supplementary feeding program (PMT) in biscuits, which also helped increase toddlers' weight (Ayuni et al., 2023; Nurilah & Sri Fitriani, 2023). Regularly supplementing biscuits in the recommended quantities faced several challenges, particularly in distribution. Qualitative interviews highlighted geographical difficulties (including remote locations, long travel distances, deteriorated road conditions, adverse weather, and inconsistent ship schedules) as the primary obstacle (Setyawati et al., 2023). Other challenges included limited availability of biscuits, insufficient manpower, and the lack of a dedicated distribution budget (Mattaliu et al., 2023). Providing supplementary food based on local ingredients can increase toddlers' food intake and also serve as an educational tool for mothers or caregivers about

local foods, ensuring the sustainability of meeting toddlers' nutritional needs through family meals.

The cadre empowerment program for providing and monitoring local food supplementation should be sustained and expanded by incorporating a greater number of cadres using a cluster-based approach. Funding sources should be diversified, including contributions from Corporate Social Responsibility (CSR) initiatives and community-based social organizations to enhance sustainability.

CONCLUSION

The community service was conducted through training on infant and young child feeding and growth monitoring for the cadres, followed by providing locally-based supplementary food for toddlers whose weight had not increased, were underweight, or were experiencing wasting. The results of the community service showed an improvement in the cadres' knowledge, with the majority previously in the poor category (60.3%) improving to a majority in the adequate category (65.1%) after the training. The provision of local supplementary food, accompanied by nutritional education, also successfully increased the toddlers' weight after one week of intervention, with an average weight gain of 0.39kg. The limitations of this initiative include the inability to provide toddlers with local food daily. Furthermore, it is imperative to enhance cross-sector collaboration to secure funding and additional resources necessary to implement the local food Supplementary Feeding Program successfully. The sustainability of this program can be achieved through cooperation between the health center, local government, and health cadres, ensuring long-term benefits and reaching a wider target audience.

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