



Healthy Village Toward Gebrak (Joint Movement of PKK and Cadres) Caring for The Nutrition of Pregnant Women Based on Local Wisdom in Kusamba Village, Bali

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Abstract: This community service program aimed to increase public knowledge, awareness, and concern regarding the importance of fulfilling the nutritional needs of pregnant women through educational and participatory approaches. The program was implemented through counselling sessions, training on making fish floss, and mentoring of posyandu cadres. The target participants were 25 PKK members and 25 posyandu cadres from Kusamba Village, Klungkung, Bali Province. The implementation adopted a Participatory Action Research (PAR) approach, which aimed to empower the community by providing direct experience in service activities. Considering the conditions of existing partners—namely the PKK and posyandu cadres—new ideas were developed to diversify supplementary feeding (PMT) programs using local wisdom in Kusamba Village to improve maternal nutrition. The results showed: (1) a 98% increase in community knowledge regarding the nutritional needs of pregnant women and chronic energy deficiency (CED); (2) a 100% increase in knowledge about animal-based foods and the nutritional content of skipjack tuna; (3) the successful creation of skipjack tuna floss products (100% success rate); (4) the ability to operate floss-making and oil spinner machines with a 100% success rate; and (5) a 96% improvement in self-capacity, financial management, and product marketing. These outcomes demonstrate that community-based nutrition initiatives for pregnant women can serve as an effective strategy to support sustainable maternal and child health programs grounded in local wisdom and community participation.

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Introduction

The health of pregnant women is one of the important indicators in determining the quality of future generations' health, especially in terms of nutrition during pregnancy. Nutritional problems must be addressed from the time the baby is still in the womb. 17% of pregnant women are malnourished and at risk of Chronic Energy Deficiency (CED) (Kemenkes RI., 2024). Mothers with chronic energy deficiency (CED) malnutrition will affect the fetal growth and development process, increasing the risk of delivering low birth weight (LBW) babies and/or stunting, which will impact children up to the toddler stage (Menteri Kesehatan Republik Indonesia, 2016) (Kementerian Kesehatan Republik Indonesia, 2023).

Risquesdas data (2023) shows the prevalence of chronic energy deficiency (CED) risk among women of childbearing age (WCA) is 14.1%, while among pregnant women it is 17.3%. Klungkung Regency is one of the regencies in Bali Province, being the second smallest out of the 9 regencies and cities in Bali. Data from the Dawan I Public Health Center



Unit (UPTD Puskesmas) which covers Kusamba Village shows no maternal mortality (MMR) or infant mortality (IMR), but there is 1 person (2.9%) out of 34 pregnant women who experienced chronic energy deficiency (CED), and 7 out of 51 (13.7%) toddlers in Kusamba Village experienced stunting (Didah, 2020) (Nailis et al., 2017) (WHO, 2016).

Target SDG 2.2, all forms of malnutrition are expected to be addressed, including meeting the nutritional needs of pregnant and breastfeeding mothers (Hamdy et al., 2023). Management of KEK is carried out thru cross-program specific nutritional interventions, especially during the implementation of integrated antenatal care services, including providing supplementary feeding to pregnant women at risk of KEK in accordance with the Minister of Health Regulation number 51 of 2016. Supplementary feeding made from local food, utilizing existing local wisdom, is one strategy for addressing nutritional problems in toddlers and pregnant women. It is hoped that supplementary feeding activities using local food can sustainably promote family food and nutrition independence (Sanjiwani Agatha Ruth Mahawikan et al., 2022; Rahmi et al., 2023).

One important aspect of local wisdom that is beneficial for the health of pregnant women is the utilization of marine resources as a source of nutritious food. Indonesia, as a maritime and archipelagic nation with most of its territory consisting of water, is rich in animal food resources, particularly fish, with 30 different species. However, this abundance of fish resources is still not being utilized optimally. This shows that the potential for utilizing local food is very open, including for family food provision, and for improving the nutrition of pregnant women and young children (Nyoman et al., 2022). Based on the potential of Kusamba Village in the fisheries sector, it has a positive impact on the health and economy of the community. In terms of health, this fish contains 100 grams of nutrients including 1.50% fat, 69.40% water, 25.00% protein, 0.03% carbohydrates, and 2.25% minerals. The protein in skipjack tuna is complete amino acids, which are very necessary for pregnant women. Additionally, the mineral content in skipjack tuna meat includes phosphorus, magnesium, iron, zinc, calcium, copper, selenium, and fluoride. Research shows that animal protein, especially from fish, can improve the nutritional quality of pregnant women and aid fetal development, while economically, the positive impact can increase community income (Nailis et al., 2017; Meilani et al., 2024).

Based on preliminary studies and situation analysis conducted in Kusamba Village, in the fisheries sector, 18 people are employed as fishermen, 70 people as laborers in fisheries businesses, and 229 people as owners of fisheries businesses. Additionally, 2125 people are housewives with uncertain or no employment out of the total population of Kusamba Village. Additionally, Kusamba Village, especially in the fisheries sector, is known as the largest fish smoking center in Bali, located in the coastal area of Klungkung Regency, where fresh skipjack tuna is easily obtained with a catch of approximately 50 fish per day per fisherman, depending on the sea conditions. Based on per capita income in the fisheries sector, the per capita income for each household in the fisheries sector is IDR. 350,000.

Managing abon is one type of food that is widely enjoyed by all groups, including pregnant women, because of its delicious taste. Abon is a mixture of staple foods made from boiled fish, which is then mashed with kitchen spices, and stir-fried with a little cooking oil. Based on interviews with the head of the belayan group in Kusamba village, for every 1 kg of shredded fish produced, approximately 4-5 fresh fish are needed as the main raw material. This amount can vary depending on the water content, type of fish, and processing techniques used. The community service activity carried out by the lecturers of the Kartini Bali Health Polytechnic synergized with the Kusamba village apparatus, involving 50 people divided into



25 PKK mothers and 25 posyandu cadres as target partners in this activity. The aim was to process fish as a model for the community, not only to increase knowledge about health but also to improve economic aspects and increase household income.

PKK groups often serve as the driving force in various empowerment activities, including in the health sector, which focuses on improving nutrition and the well-being of pregnant women with chronic energy deficiency (CED) and preventing stunting from an early age (Didah, 2020). Empowering Posyandu and PKK cadres in Kusamba Village to utilize local wisdom for improving the nutrition of pregnant women is a strategic step. Enhancing the capacity of Posyandu and PKK cadres thru education, training, and mentoring in utilizing local wisdom for improving the nutrition of pregnant women can be an appropriate and sustainable solution. Not only that, the purpose of this activity is not only in the health sector but also in the economic sector by providing assistance up to the creation of product labels and the development of e-commerce platforms owned by partners, namely thru Facebook, Instagram, Shopee, and Tokopedia, so that target partners can produce and market their products themselves, indirectly increasing community income.

Method

The method for implementing this community service activity uses Participatory Action Research (PAR) with 7 7-stage approach, and implementation methods for community service activities are as follows:

- 1) Stage I: This stage aims to gather information to find effective solutions to problems through an efficient problem-solving process.
- 2) Stage II: This stage aims to obtain written and verbal approval from relevant parties.
- 3) Stage III: This stage aims to prepare the tools and materials for the service activity, including materials and other supporting tools to facilitate the activity. This activity was carried out in Kusamba Village, Klungkung Regency.
- 4) Stage IV Pre-test related to the nutritional needs of pregnant women, chronic energy deficiency, animal-source foods, and the nutritional content of skipjack tuna
- 5) Stage V: Training on how to make fish abon using appropriate technology, specifically the abon cooking machine and oil spinner:
- 6) Stage VI: Training and counselling provided to the community to enhance self-capacity in running a business, and how to manage finances and market products through e-commerce platforms.
- 7) Stage VII: This stage will involve evaluating all activities that have been carried out, identifying any obstacles encountered in the field, and preparing for the necessary follow-up actions.

Result and Discussion

1) Stage I: Site Survey, Observation, and Needs Analysis

Based on the preliminary study and situation analysis conducted in Kusamba Village, in the fisheries sector, 18 people are employed as fishermen, 70 as fishery workers, and 229 as fishery business owners. Additionally, 2125 people are housewives with uncertain or no employment out of the total population of Kusamba Village. Additionally, Kusamba Village, especially in the fisheries sector, is known as the largest fish smoking center in Bali, a fishing village, and a sea salt farming community. Kusamba Village is located in the coastal area of Klungkung Regency, where fresh skipjack tuna is easily obtained, with an average catch of approximately 50 fish per day per fisherman, depending on the sea conditions.



The community service activity carried out by the lecturers of the Kartini Bali Health Polytechnic synergized with the Kusamba village apparatus, involving 50 people divided into 25 PKK mothers and 25 posyandu cadres as target partners in this activity. The purpose was to process fish as a model for the community, not only to increase knowledge about health but also to improve economic aspects that could increase household income.



Figure 1. PKM team meeting with the Kusamba Village Head



Figure 2. Team Meeting with Posyandu Cadres and PKK Mothers



Figure 3. Team Meeting with Permission from Dawan I Health Center

2) Stage II: Permission to Carry Out PKM Activities

This stage aims to obtain written and verbal approval from relevant parties.

3) Stage III: Preparation of Tools and Materials for Activities



This stage aims to prepare the tools and materials for the service activity, including stationery, questionnaires, and other supporting tools to facilitate this activity.

4) Stage IV Pre-Test & Post-Test

This activity involved distributing pre-test and post-test questionnaires on the topics of nutritional needs for pregnant women, chronic energy deficiency, animal-source foods, and the nutritional content of skipjack tuna. The questionnaire consisted of 20 questions that respondents completed before receiving education from the speaker. After the counselling, a post-test was conducted using the same questionnaire.



Figure 4. Respondents filling out pretest and posttest questionnaires

Here are the results of the frequency distribution of pretest and posttest results for the nutritional needs of pregnant women and chronic energy deficiency :

Table 1. Frequency Distribution Knowledge of PKK Mothers and Posyandu Cadres Regarding the Nutritional Needs of Pregnant Women and Chronic Energy Deficiency

No	Knowledge	Pretest		Posttest	
		f	%	f	%
1	Good	44	88	49	98
2	Fair	6	12	1	2
3	Poor	0	0	0	0
	Total	50	100	50	100

Based on the table above, it shows that before the counselling was given, the respondents' knowledge of the nutritional needs of pregnant women and chronic energy deficiency was good for 44 people (88%) and sufficient for 6 people (12%). After the counselling, good knowledge was reported by 49 people (98%) and sufficient knowledge by 1 person (2%).

Table 2. Frequency Distribution Knowledge of PKK Mothers and Posyandu Cadres Regarding Animal Foods and the Nutritional Content of Skipjack Tuna

No	Knowledge	Pretest	Posttest
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		f	%	f	%
1	Good	43	86	50	100
2	Fair	7	14	0	0
3	Poor	0	0	0	0
	Total	50	100	50	100

Based on the table above, it shows that before being given animal food counselling and information on the nutritional content of skipjack tuna, 43 respondents (86%) had good knowledge and 7 respondents (14%) had sufficient knowledge. After the counselling, 50 respondents (100%) had good knowledge.

- 5) Stage V: Training on how to make skipjack fish floss using appropriate technology (TTG), specifically the floss cooking machine and oil spinner, held at Kusamba village hall, Klungkung, with a resource person from a nutritionist from Dawan I Health Center, Klungkung. The target participants for this activity are 25 PKK mothers and 25 posyandu cadres.

Table 3. Frequency Distribution Training for PKK mothers and Posyandu cadres on Making Skipjack Fish Abon using TTG

No	Skilled	Result	
		f	%
1	Skilled	50	100
2	Moderately Skilled	0	0
3	Not Yet Skilled	0	0
	Total	50	100

Based on the table above, it shows that after training, all 50 (100%) respondents were skilled in making shredded meat using TTG, and no respondents were moderately skilled or unskilled.



Figure 5. Training for PKK mothers and Posyandu cadres on making Skipjack Tuna Abon using TTG



6) Stage VI: Training and Education

This activity was provided to the community to enhance their self-capacity in running a business, and how to manage finances and product marketing through e-commerce platforms. The speakers are from the PKM team.

Table 4. Frequency Distribution Training for PKK mothers and Posyandu cadres on Self-Capacity Building in Running a Business

No	Knowledge	Result	
		f	%
1	Good	50	100
2	Fair	0	0
3	Poor	0	0
	Total	50	100

Based on the table above, it shows that after receiving education on self-capacity in running a business and how to manage finances and market products through the E-commerce platform, all 50 respondents (100%) have good knowledge.



Figure 6. Training for PKK mothers and Posyandu cadres on making Skipjack Tuna Shredded Fish using TTG

7) Stage VII: Evaluation and Follow-up

This stage will involve evaluating all activities that have been carried out, identifying any obstacles encountered in the field, and preparing for the necessary follow-up actions.

This PKM activity resulted in a product made from skipjack tuna, processed into ready-to-eat fish floss, which is one creative idea for PMT. Skipjack tuna that has been processed into fish floss can be one alternative source of animal protein that can be utilized by coastal communities, especially pregnant women. This fish has a very high protein content; in 100 grams, it contains more than 25% protein compared to 1.50% fat. Protein is one of the macronutrients needed by pregnant women for the growth and development of the fetus in the womb. When a mother's nutritional status is poor, it will affect her body mass index during pregnancy and fetal development, leading to the birth of low birth weight (LBW) babies and/or stunting, which will impact children up to the age of five (Nurhayati, 2016), (Meilani et al., 2024), (Nyoman et al., 2022), (WHO, 2016), (Shekar et al., 2017).

PKK groups and Posyandu cadres are the driving force behind various empowerment activities, including in the health sector, which focuses on improving nutrition and well-



being for pregnant women with KEK and preventing stunting from an early age thru the provision of supplementary feeding (PMT) (10). Empowering partners to utilize local wisdom in Kusamba Village to improve the nutrition of pregnant women is a strategic step. Increasing partner capacity thru education, training, and mentoring in utilizing local wisdom and using TTG for improving the nutrition of pregnant women can be an appropriate and sustainable solution (Didah, 2020).

Community development is a series of efforts to encourage people to be more empowered in improving human resources and to optimize those resources, thereby increasing their capacity and abilities by utilizing their potential, while also enhancing economic capabilities and independence thru self-help activities. In line with research showing that animal protein, especially from fish, can improve the nutritional quality of pregnant women and aid fetal development, while on the economic side, the positive impact will be able to increase the income of the community, including fishermen and partners.

The entire process was carried out based on the evaluation results with the PKK Chair and Posyandu cadres. From the counselling and training activities, it was found that there were no obstacles, and all activities could be carried out well and smoothly. The sustainability of the post-activity program involves providing assistance to partners in designing product labels and marketing products, as well as preparing the final report, publishing in the community service journal in Jurnal Undikma, media mass publication on baliwakenews, and uploading activity videos on the YouTube channel of Politeknik Kesehatan Kartini Bali (Rahmi et al., 2023).

Conclusion

The conclusion of this activity is:

- 1) Increased community knowledge regarding the nutritional needs of pregnant women and chronic energy deficiency (CED) by 98%.
- 2) Increased knowledge regarding foods sourced from animal products and the nutritional content of skipjack tuna by 100%.
- 3) Able to produce skipjack tuna floss by 100%.
- 4) Able to use the floss cooking machine and oil-pulling spinner to make tuna floss with minimal oil content by 100%.
- 5) Self-capacity building, financial management, and product marketing thru e-commerce platforms. In running the business with percentage 96%.

Recommendation

This nutrition intervention activity with the variation in supplementary feeding can be carried out routinely and sustainably for both PKK mothers and Posyandu cadres, and can obtain cooperation and support from non-governmental organizations and the private sector for further training, market access, and funding.

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