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COMMUNITY EDUCATION ON MORINGA OLEIFERA UTILIZATION TO IMPROVE NUTRITIONAL HEALTH IN LAPULU VILLAGE, KENDARI CITY

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ABSTRACT

Background: Moringa Oleifera contains nutrients that make it a good choice for improving the nutritional intake of children at risk of stunting. Stunting is a growth disorder that occurs in toddlers due to chronic malnutrition, characterized by a height that is not proportionate to their age. The Abeli subdistrict, including the Lapulu village, has the highest prevalence of stunting at 2.7%, caused by inappropriate parenting, maternal knowledge, poor food intake, and economic factors. Method: This community service activity was carried out in several stages, including: the preparation stage, implementation, namely coordination with partners regarding the determination of time and place, as well as evaluation and assessment of the results of the activity. Result: Before the educational activities were carried out, the level of knowledge among mothers of toddlers about the use of Moringa Oleifera for stunting showed that 16 people (61.5%) had insufficient knowledge. However, after the education was provided, there was an increase in knowledge among 23 people (88.5%). Based on the Paired Sample T Test, the mean value was 4.46 and the p-value was 0.000. Therefore, it can be concluded that there was an increase in knowledge among the Lapulu Village community regarding the benefits of moringa for stunting. Conclusion: Before receiving education, the level of knowledge of mothers of toddlers was low, but after receiving education, their knowledge increased. Based on the Paired Sample T Test, there was an increase in knowledge before and after receiving education.

1. INTRODUCTION

Oleifera is a local plant that is high in nutrients such as protein, iron, calcium, vitamin A, and vitamin C, which play an important role in supporting children's physical growth and brain development, making it good for preventing stunting[1,2]. In addition, moringa can be used as a skin care ingredient[3].

Stunting is a growth and development disorder characterized by a height that is lower than that of other children of the same age due to chronic malnutrition. This problem remains a global public health issue that requires serious attention[4]. Children who experience stunting are at higher risk of morbidity and mortality, and experience cognitive development disorders that can impact future

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productivity[5]. Moringa Oleifera have many positive effects on physical health, including positive effects on the health of infants and toddlers in terms of preventing stunting[6]. Research shows that the use of moringa leaves has an effect on the incidence of stunting. The study by Suriawati et al. shows that the use of moringa leaves as processed food (noodles) has an effect on the incidence of stunting[7].

In Indonesia, nutritional problems in children and mothers remain a major challenge in efforts to improve public health. Long-term malnutrition can stunt children's growth and development and increase the risk of child mortality [8]. According to data from the Indonesian Ministry of Health (2024), the prevalence of stunting in Indonesia has decreased from 24.4% in 2021 to 21.5% in 2023. However, this figure is still far from the national target of 14% in 2024[9] (Kemenkes RI, 2024). Data from the Kendari City Health Office (2022) shows that the highest prevalence occurred in Abeli District at 2.7%, followed by West Kendari District at 2.6%, and in third place were Kendari District and Wua-wua District, each at 2.3% [10]. (Dinkes Kota Kendari, 2024)

One local plant that has the potential to improve public health in efforts to prevent nutritional problems, including stunting, is the use of moringa leaves or Moringa oleifera [11] (Krisnadi et al., 2023). Moringa leaves are one of the most abundant plants and are consumed as vegetables by the people of Lapulu Village. Located on the coast, the main livelihood of the people of Lapulu Village is fishing. The potential of fish resources in this area is quite abundant, but it has not been fully utilized, either for family consumption or for improving the economic welfare of the community. One of the problems often encountered in fishing communities such as Lapulu Village is that most of the fish caught are sold for economic purposes, while consumption at home is often limited to lower quality fish or leftovers. This is one of the factors associated with the high rate of stunting in coastal areas. Therefore, to increase the utilization of moringa leaves and tuna produced by fishermen, it is necessary to conduct training and practice in making fortified tuna nuggets with moringa leaves. This innovation can improve social and economic welfare for the community, especially fishermen living in the Lapulu Village, Abeli District, Kendari City.

This educational intervention on the use of moringa leaves was carried out because the community lacked the knowledge and skills to make moringa-fortified tuna nuggets as an innovation to address nutritional problems. In general, this community service activity aimed to increase the knowledge and skills of the community, especially mothers in the coastal area of Lapulu Village, about the benefits of moringa leaves and how to make moringa-fortified tuna nuggets.

2. METHODE

The partners in this educational activity and utilization of moringa leaves are residents of Lapulu Village, Abeli District, Kendari City, namely 34 mothers of toddlers. The educational activities and practical application of moringa leaves as healthy food, namely the production of tuna nuggets fortified with moringa leaves as an innovation, were carried out in the Lapulu Village Hall, Abeli District, Kendari City, on September 16, 2015, from 8:00 a.m. to 12:00 p.m. WITA. To achieve the set objectives, the educational activity and the production of moringa-fortified tuna nuggets utilized two methods (mixed method). The mixed method in research or community service activities is a fairly effective approach. This method is commonly used when researchers require more than one approach to solve problems and achieve goals [12].

The mixed methods used in the implementation of these community service activities can be explained as below:

1. Participatory and collaborative methods with an educational or outreach approach

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The educational activity on the benefits of moringa leaves in preventing nutritional problems (stunting) involved breastfeeding mothers in the Lapulu sub-district of Abeli, Kendari City. In this educational activity on the benefits of moringa leaves in preventing stunting, public health students from Halu Oleo University were tasked with collecting data and educating breastfeeding mothers in the Lapulu sub-district hall.

2. The method of applying "appropriate technology and innovation" is by practicing the production of tuna nuggets fortified with moringa leaves. The production of tuna nuggets fortified with moringa leaves is intended as a complementary food for breast milk or MP-ASI. The production of moringa leaf-fortified tuna nuggets requires several tools and materials. The tools used in the production of moringa leaf-fortified tuna nuggets include a portable stove, steamer, copper pot, and electric scale. The ingredients or materials used include fresh tuna, tapioca flour, moringa leaves, eggs, and cooking oil. .

The educational activities and production of moringa-fortified tuna nuggets were carried out in several stages, starting from planning, implementation, and evaluation. All stages were carried out regularly and according to the prepared plan. The complete stages in the implementation of the educational program and production of moringa-fortified tuna nuggets can be seen in Figure 1 below:

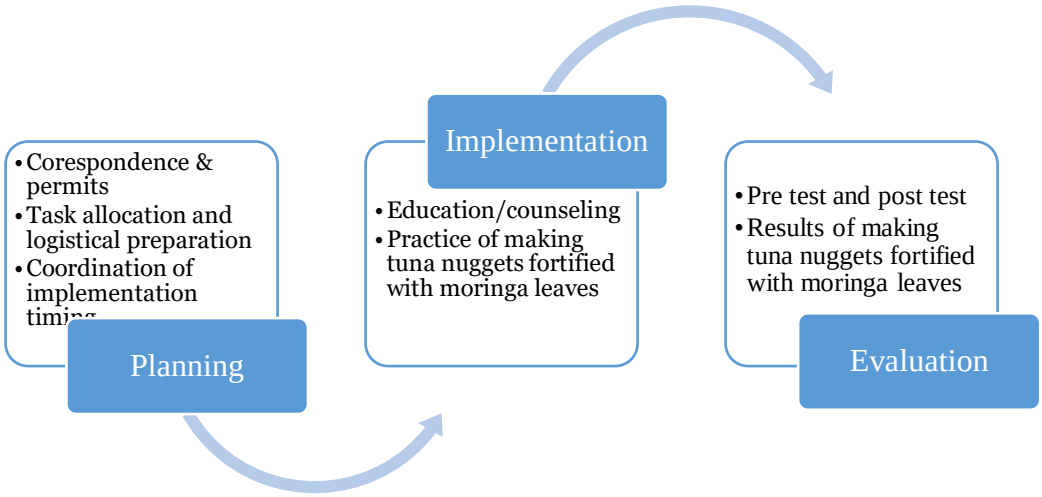


Figure 1. Implementation Stage of Community Engagement Activities

The detailed stages of activities, tools, and methods used in this community service program can be described as follows:

1. Planning Stage
   The planning stage is the initial stage in the community service program integrated into the 2025 UHO Thematic Community Service Program. During the planning stage, solutions and targets are determined based on the problems identified in the activity objectives. Then, permits are obtained from the relevant agencies/institutions, tasks are assigned, and the tools and materials used for education and the production of fortified tuna nuggets and moringa are prepared. Tools and materials for education include laptops, writing instruments, booklets, and PowerPoint presentations. Meanwhile, tools and materials for producing fortified tuna nuggets with moringa leaves include a portable stove,

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steamer, copper pot, and electric scale. The ingredients or materials used include fresh tuna, tapioca flour, moringa leaves, eggs, and cooking oil.

2. Implementation Stage
The next stage in the 2025 UHO Thematic Community Service Program is the implementation stage. This implementation stage is the core stage of the Thematic Community Service Program. The implementation of educational activities and the production of fortified tuna nuggets with moringa leaves took place on September 16 from 8:00 a.m. to 12:00 p.m. WITA. Further details of this implementation phase can be seen in Table 1 below:

Table 1. Activities in the Implementation Stage of Education and Production of Fortified Tuna Nuggets with Moringa Leaves

No	Time	Activity Description	Implementer/Person in charge
1	08:00-08:15	Registration and attendance list completion by participants and distribution of pre-test questionnaires.	Organizing Committee (2025 UHO Thematic Community Service Program Student Participants
2	08:15-08:45	Delivery of remarks – remarks and official opening of the event by the Head of Lapulu Village and remarks by the Chair of the Event Implementation Team	Organizing Committee (2025 UHO Thematic Community Service Program Student Participants
3.	08:45-09:00	Coffee Break and Snack Distribution	Organizing Committee (2025 UHO Thematic Community Service Program Student Participants
4.	09:00-10:15	The presentation of educational material by the speaker was accompanied by the distribution of booklets on the benefits of moringa for preventing stunting and how to make tuna nuggets fortified with moringa leaves. This educational process was accompanied by a discussion or question and answer session.	Organizing Committee (2025 UHO Thematic Community Service Program Student Participants
5.	10:15-11: 45	Practical demonstration of how to make tuna nuggets fortified with moringa leaves	Committee and faculty team
6.	Closing	Closing ceremony for educational activities and practical training on making tuna nuggets fortified with moringa leaves	Organizing Committee (MC)

3. Evaluation Stage
During the evaluation stage, the success of the activities carried out was assessed. The educational activities and the production of fortified tuna fish with moringa leaves ran smoothly, and the output of these activities was also quite good, as there was an increase in knowledge among the target audience (breastfeeding mothers) in Lapulu Village, Abeli District, Kendari City. The evaluation results, using pre-test and

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post-test questionnaires, showed an increase in mothers' knowledge about the benefits of moringa leaves for preventing stunting. The pre-test was conducted when participants registered, and the post-test was conducted at the end of the activity after the closing ceremony. During the evaluation process, the team also observed the enthusiasm of the participants. In addition, the team also observed that the participants, in this case breastfeeding mothers, were able to demonstrate how to make tuna nuggets fortified with moringa leaves. The results of the evaluation of the success of this activity can be seen from the changes or increases in the knowledge of the respondents (breastfeeding mothers) about the benefits of moringa leaves in preventing stunting (Tables 2 and 3).

3. RESULTS AND DISCUSSION

The educational activity on the benefits of moringa leaves held in the Lapulu Village Hall received a positive response from the community. In general, the core activity of this community service program was to provide education and practical training on making tuna nuggets fortified with moringa leaves. The education provided was health education, namely activities or efforts to increase individual health knowledge, at least regarding the management of disease risk factors or health problems and clean and healthy living behaviors in an effort to improve the health status of participants. During the implementation of the activity in the session on education and practice in making moringa-fortified tuna nuggets, the participants were very enthusiastic. Most participants showed interest in information about the nutritional content of moringa leaves and their application as a nutritious food ingredient in efforts to prevent stunting and control hypertension.

After the activity, there was an increase in understanding among participants regarding the importance of using moringa leaves to support family health. Based on observations and feedback, the community was able to explain the benefits of moringa leaves, recognize their nutritional content, and understand their role in preventing stunting. In addition, through the practice of making complementary foods based on moringa leaves, the community gained direct skills in processing local food ingredients into nutritious menus that are easy to apply in the household. This activity demonstrates that a practice-based educational approach can improve the community's knowledge and skills in nutrition and health. Before the counseling session, a questionnaire was given to assess knowledge before and after the counseling session. The following is the pre-test and post-test of the knowledge of mothers of toddlers about the benefits of moringa in Table 1.

Table 1. Knowledge Distribution through Pre-test and Post-test on the Benefits of Moringa Leaves for Stunting Prevention

No	Knowledge Category	Pre-Test		Post-Test	
		n	%	n	%
1	Baik Good	10	38,5	25	96,2
2	Kurang Less	16	61,5	1	0,30
Total		**25**	**100**	**26**	**100**

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Based on Table 1, the level of knowledge of mothers of toddlers regarding the benefits of moringa for preventing stunting was low in 16 people (61.5%). However, after receiving education, the level of knowledge increased to 25 people (96.2%). This shows that the education or counseling process was quite successful because there was a change in the level of knowledge between before and after the education was provided. The results of this community service are in line with the findings from previous community service activities, which showed that after the education program, participants experienced an increase in knowledge or understanding about the use of moringa leaves[7].

Furthermore, the results of the Paired Sample T-Test analysis were used to determine whether there was a statistically significant difference between the two conditions or measurements. The following is the knowledge of mothers of toddlers about the benefits of moringa, as shown in Table 3.

Table 3. The knowledge before and after education on the health benefits of moringa

Knowledge	**Intervention Group**			
	***Mean* (SD)**	***Mean* (Cl 95%)**	*T*	*P*
Pre-test	5.54 (1,1)	4,46	-20.609	0.000
Post-test	10.00 (0,0)	(-4.907-4.016)		

From Table 3, it can be seen that the average knowledge before education or counseling was 5.54 and increased to 10 after the implementation of education or counseling. The results of the analysis using the Paired Sample T-Test yielded an average value (Mean) of 4.46 and a p-value of 0.000.

Therefore, it can be concluded that there is a difference in the level of knowledge before and after education. The difference in respondents' knowledge before and after education shows that this activity was quite successful. This is supported by several studies and community service programs that show that educational or counseling interventions can change respondents' knowledge[13]. The educational results regarding the content and health benefits of moringa leaves were well received, and several community members also asked questions based on their experiences[14].

This community service activity can also have a social and economic impact, especially for housewives. Housewives in the Lapulu sub-district of Kendari City, especially those whose livelihood is fishing, can form a household-scale business group to produce complementary foods that can improve family welfare. This family welfare can take the form of the health of each individual family member, as well as increasing or supporting family income. Socially, housewives are not only focused on taking care of their children or families, but they can also build social networks so that they can become more productive. This is in line with several studies and community service programs that have succeeded in improving the welfare of coastal communities or underprivileged communities, enabling them to live better and more productive lives[15,16].

The core activities of this community service program began with a pre-test, followed by an educational process and practical training on making tuna nuggets fortified with moringa leaves, and concluded with a post-test. This is illustrated in Figures 1 to 4.

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Figure 1. Pre-Test Process



Figure 3. Practice of Making Fortified Tuna Nuggets with Moringa Leaves



Figure 2. Education on the Health Benefits of Moringa Leaves

After identifying the problems together with partners through discussion, the issues related to stunting and high fish production in Lapulu Village were formulated. The solution offered is the processing of tuna nuggets with added moringa leaves. This activity not only provides a solution to existing problems but also optimizes local wisdom as fishermen. The final stage of this community service activity is to provide assistance in the processing of moringa nuggets.

The positive impact of community service activities in Lapulu Village is an increase in the knowledge of mothers of toddlers about the use of moringa leaves in toddler food to prevent stunting and improve health. Ultimately, this will have a long-term impact, namely the formation of prosperous families or households.

Figure 4. Post-Test Process

4. CONCLUSION

The implementation of the KKN-Tematik student work program in Lapulu Village, Abeli District, Kendari City has been running well as a concrete manifestation of the Tri Dharma Perguruan Tinggi (Three Pillars of Higher Education), particularly in the field of community service. Through this activity, students can implement the knowledge and skills acquired during lectures to provide direct benefits to the local community. The training activities carried out have shown positive results, as evidenced by the high participation and enthusiasm of the participants in the training on making moringa nuggets with added moringa leaves. Moringa plants, which are easily found in the area, were previously rarely used in food products. Through this program, the community has gained new knowledge about the use of moringa leaves as a highly nutritious food ingredient that has the potential to help prevent stunting.

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