11th LIS International Conference
Liga Ilmu Serantau 2025

ISSN: 2985-4393

Analysis of Literacy Skills on Community Nutrition, Land Empowerment and Product Diversification to Supports pre valency stunting in West Sumatera.

Suhaemi, Zasmeli [1, b)], Yuliana[2, c)], Mayuasti[1, a)] , Laila, Wilda[3, d)] and Safaria, Sayendra[1, e)]

Author Affiliations
[1]*University of Nahdlatul Ulama West Sumatera, Jalan S. Parman No. 119A Padang, West Sumatera. 25134*
[2]*University of Negeri Padang, Jl. Prof. Dr. Hamka No.1 Padang, West Sumatera 25132*
[3]*University of Perintis Indonesia, Jalan Adinegoro, Lubuk Buaya, Padang, West Sumatra 25173,*

Author Emails
[a)] Corresponding author: mayuasti@gmail.com
[b)]zasmelisuhaemi@unusumbar.ac.id
[c)]yuliana@fpp.unp.ac.id
[d)]wildaraziq@gmail.com
[e)] riaronal142@gmail.com

Abstract. The number of stunting toddlers cases in West Sumatera is higher than the National average. Parents' low understanding of nutrition is one of the reasons why stunting might be happened to the children, beside economy factors. This study has been conducted to analyze the degree of knowledge of adolescents and mothers of toddlers, especially families at risk of stunting, regarding nutritional knowledge, land empowerment and product diversification. A pre-test was given to 200 participants that are adolescents and mothers of risk stunting children. The activities are conducted in two districts of West Sumatra Province, there are 100 people in each of the Agam and 50 Kota districts. After pre-test, counseling was provided by delivering some materials related to digital literacy of nutrition, land empowerment as a provider of nutritious food ingredients, and diversification of healthy and nutritious products based on local ingredients. Each topic was delivered in the separated days. After giving all materials, the posttest was given. All answers of pretest and posttest were analyzed. The result of the analyzed pretest data shows that the level of participants' knowledge is very low because only around 2 questions can be answered correctly. Meanwhile, after getting all 3 topics related to the nutrition knowledge, all questions can be answered correctly. It indicates that the improvement of nutrition knowledge for West Sumatera residents is needed. The solution of this nutrition knowledge problem to reduce stunting is improving literacy both digitally and offline modes about nutrition, and others knowledge related to it.

Keywords: literacy, digitally, nutrition, stunting, west sumatera.

1. INTRODUCTION

Reducing stunting is crucial as early as possible to avoid detrimental long-term impacts such as stunted growth and development. Stunting affects brain development, thus reducing a child's intelligence. Stunting can increase the risk of illness and death, suboptimal brain development, resulting in delayed motor development, and stunted mental growth [1]. These risks reduce productivity in the adulthood. Stunting also makes children more susceptible to disease. Stunted children are at higher risk of developing chronic diseases in the adulthood. In fact, stunting and various forms of nutritional problems are estimated to contribute to the loss of 2-3% of Gross Domestic Product (GDP) annually [2].

Based on SSGI survey in 2021, the prevalence of stunting in West Sumatra was 23.3 percent, then in 2022 it was recorded at 25.2 percent which is increased 1.9 percent from the previous year. Moreover, in 2023 there was a decrease of 1.6 percent to 23.6 percent. Meanwhile, the target to be achieved is 14%, as is the case in 2024 [3][4]. The problem of stunting is closely related to poverty. The poverty line of West Sumatra Province in March 2024 was 708,416 rupiah per capita per month, an increase of 6.06 percent compared to the poverty line in 2023 (Rp667,925/capita/month). This increase was slower than the previous year's poverty line of 9.33% [3]. Hence, the prevalence of stunting due to poverty can be reduced by providing nutritious food sources in the home yard.

Stunting is a nutritional problem caused by poor dietary habits in toddlers. It can be occured due to limited access to and a lack of public awareness of nutritious food. The government has launched various policies and programs to address stunting in Indonesia. The National Population and Family Planning Agency (BKKBN) of West Sumatra Province is one of the government agencies leading the stunting response. One of the programs routinely implemented by the BKKBN West Sumatra is providing training in nutritious food production to address stunting. However, practically, changing people's mindsets and habits to consume nutritious foods is challenging, so the program has not been able to run independently. Furthermore, limited raw materials and skills to produce various nutritious foods can also pose challenges to the program's sustainability within the community.

Addressing the widespread problem of stunting in both urban and rural areas requires nutritional interventions, both specific and sensitive. Specific nutritional interventions utilize local resources found in home gardens, which are high in nutrients, particularly protein, calcium, and phosphorus.

This study aims to obtain information about the level of knowledge of families with stunted toddlers or those at risk regarding three main things, namely, nutritional literacy, land empowerment as a provider of nutritious food ingredients and diversification of healthy, nutritious products based on local ingredients.

2. LITERATURE REVIEW

Stunting (short stature) is a world major nutritional problem, particularly in poor and developing countries. Stunting can increase the risk of morbidity and mortality, lead to suboptimal brain development, resulting in delayed motor development, and stunted mental growth [1]. This can lead to reduced productivity in adulthood. In fact, stunting and various forms of nutritional problems are estimated to contribute to a loss of 2-3% of Gross Domestic Product (GDP) annually [2]. According to the 2021 SSGI survey, the prevalence of stunting in West Sumatra was 23.3 percent, and in 2022 it was recorded at 25.2 percent, which is 1.9 percent increase from the previous year. Then, in 2023, there was 1.6 percent decrease to 23.6 percent. Meanwhile, the target that must be achieved is 14%, and it also must be achieved in 2024. The problem of stunting is closely related to poverty. The poverty line for West Sumatra Province in March 2024 was IDR 708,416 per capita per month, a 6.06 percent increase compared to the 2023 poverty line (IDR 667,925/capita/month). This increase was slower than the previous year which is 9.33% increase[3]. Indonesia is the fifth place in the world for the number of children with stunting. Moreover, West Sumatra is the fifth rank above the Indonesian average for both stunting and underweight, with rates of 25.2 percent and 19.4 percent, respectively.

Nutrition education significantly impacts knowledge and attitudes [5]. Academic Nutrition and Dietetics (AND) defines that nutrition education as a formal process to train clients' abilities or improve their knowledge in choosing foods, physical activity, and behaviors related to maintaining or improving health [6]. Therefore, nutritional literacy is one of the activities that must be carried out to address the existing problem of stunting and improve the nutritional knowledge of toddlers' mothers [7]. Because increasing the knowledge and awareness of cadres and mothers of toddlers about the real dangers of stunting in children will support early detection of stunting and good nutrition for children [8]. Based on the previous research, nutritional counseling or literacy intervention methods have been proven to improve the knowledge, attitudes, and behavior of toddlers' mothers [9].

Reducing its prevalence can also be achieved by providing nutritious food sources in home gardens. The research shows that the presence of home gardens among vulnerable households can improve food security and dietary diversity among vulnerable rural households [10]. Provision of nutritious food in home gardens, a common form of food production in many rural communities in developing countries, has been shown to have great potential to improve household food security and reduce micronutrient deficiencies. Studies of various food provision models have shown a positive correlation between better food security and nutritional diversity[11], [12], [13], [14], [15], [16].

Conceptually, providing livestock feed [17] and plants is very supportive and can be integrated, as in the previous research, providing moringa and African leaves as feed for ducks and chickens [18][19][20]. Furthermore, it is easy to grow these plants in the yard [21].

Diversification of food production has a significant positive long-term effect on the prevalence of malnutrition and overweight [22]. Economic policies to combat food insecurity should be directed at increasing food production. Investments in diversifying food production can help alleviate food insecurity [23].

3. RESEARCH METHODOLOGY

- Research design

  This research was conducted by using mixed methods, namely qualitative and quantitative. The population and sample of this research are mothers of toddlers or under five children with stunting or those at risk who were given materials related to three topics reviewed: nutritional literacy, land empowerment as a provider of nutritious food, and diversification of healthy and nutritious products based on local ingredients. Every topic which consisted some materials was provided in one day. It was divided into three materials with three main speakers from the Research Team. Two districts were selected from each research location, and each district had two chosen sub – districts.

  Moreover, pre-test and post-test were given in every materials presentation. The test consisted of 10-12 multiple-choice questions related to the topic being reviewed. The number of correct answers was calculated and processed using the Excel program to determine the percentage increase in knowledge, which was displayed as a percentage.

- Materials or tools used

  The instrument of this research was a questionnaire which was given to 50 respondents at each location. There are Four sub-districts (two for each district) from Agam and Limapuluh Kota Regencies where the stunting rate was above 24%, exceeding the provincial average. The total number of respondents was 200. They are 25% adolescent girls, 25% pregnant women, and 50% mothers of stunted toddlers. The selection of respondents was conducted in collaboration with the Regional Government Organization (OPD) for Family Planning. The topics and materials provided to the selected respondents included:

  1. Digital nutrition literacy related to nutritional knowledge for adolescent girls, toddlers, and pregnant women.
  2. Land empowerment with nutritious food ingredients (chicken, fish, and plants).
  3. Diversification of nutritious food Products made from local ingredients such as ducks, chickens, fish, and moringa leaves.

  The materials were delivered for 60–90 minutes. an andragogical approach which is combining short lectures, discussions, local case studies, and simple demonstrations was applied. Furthermore, question sheets and pens to determine the chosen answers were used as the tools. The results of the responses at each location were summarized, and increased knowledge was calculated and compared across districts.

- Analytical techniques

  Based on the material provided, the pre- and post-test results were analyzed by looking at the number of correct answers in the pre-test and the number of correct answers in the post-test. Increased knowledge was calculated and compared for each location. Data recapitulation and analysis were performed using the Excel program, which is presented in the percentage. The variable categories of knowledge are if <60% means Low, 60-79% means Fair, and ≥80% means High.

4. RESULTS

Each material provision activity at the selected location was carried out with a pre-test and post-test as shown in Figure 1. The results of the increase in respondents' knowledge before and after the provision of material related to the three topics related to nutritional knowledge, land empowerment and product diversification are as shown in Table 1.

Figure 1. Respondents in Agam Regency during answering pre-test and post-test questions.

Table 1. Results of enhancement from the pre-test and post-test of participants in the Nutrition Literacy, Land Empowerment and Product Diversification mentoring program

No	Parameter	Respondents	Average Pretest	Average Post test	Increased the knowledge and skill (%)
1	Nutrition Literacy	200	1.55	12	87.1
2	Land Empowerment with nutritious food ingredients	200	1.7	10	83.0
3	Diversification of products based on local materials	100	1.6	10	84.0
	Average				84.7

Figure 2. The results of the material provided to participants are in the form of modules according to the topics provided.

4. DISCUSSION

The results of the pre-test and post-test analysis showed an increase in respondents' knowledge after receiving an intervention in the form of brochures and counseling related to three main topics: nutritional literacy, land empowerment through nutritious food ingredients, and diversification of nutritious food products using local ingredients. First, the increase in knowledge on the topic of nutritional literacy reached 87.1%, which is the highest value compared to the other two topics. This indicates that respondents quite easily understand nutrition information, especially when presented in the form of simple brochures and interactive counseling. This high

increase may also reflect respondents' interest in the topic of nutrition because it is directly related to daily life and family health. A comprehensive understanding of nutrition significantly impacts knowledge of health and food [24]. Good nutritional knowledge is a key factor in preventing stunting, as a family's consumption patterns are influenced by their understanding of the need for balanced nutritions.

Second, knowledge on land empowerment through nutritious food increased by 83% (Good category). This significant increase also indicates that the material presented addressed issues that the community had not yet fully grasped, even though it could be implemented if there was land in their yard that could be utilized, even if not as a source of independent food for families. Knowledge of diversifying nutritious food products using local ingredients increased by 84%, which is relatively higher than land empowerment but slightly lower than nutritional literacy. This indicates that respondents are receptive to new ideas for processing local food ingredients into varied and nutritious products. However, challenges in implementing product diversification likely lie in limited skills and creativity in developing sustainable food processing [11], [12], [13], [14], [15], [16].

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Overall, these results demonstrate that the knowledge intervention, which included brochures and direct material delivery, was highly effective in increasing respondents' knowledge on all three topics. The increase was significant (over 80%) in all aspects, which were categorized as Good. This indicates that the information delivery method was appropriate for the respondents' characteristics and had a positive impact on supporting public understanding. [25][26].

In terms of land empowerment, knowledge increased by 83%. These results indicate that respondents are beginning to understand the potential of utilizing yard space to produce nutritious food[14]. Utilizing family land to grow vegetables, fruit, or plant/animal protein sources can increase household food availability, which directly contributes to improving children's nutritional intake [27]. This strategy aligns with government programs such as the Sustainable Food Yard Movement (P2L), which has been proven to increase family food availability and diversity [28].

Meanwhile, the diversification of local food products increased by 84%. This indicates that respondents are beginning to recognize the importance of processing local food ingredients into nutritious and varied products [29]. Food diversification not only improves household food security but also reduces dependence on certain staple foods, such as rice, thus ensuring a more diverse and balanced nutritional diet [30]. Several studies confirm that local food diversification can reduce the risk of micronutrient deficiencies, which are an indirect cause of stunting. [27].

When linked to stunting prevalence, increasing knowledge in these three aspects is highly relevant. Stunting is a condition of stunted growth due to chronic malnutrition influenced by low nutritional literacy, limited food access, and monotonous consumption patterns [25]. By improving nutritional literacy, land use, and local food diversification, communities are expected to intensify balanced nutritional consumption practices, which play a role in reducing stunting rates.

6. CONCLUSION

By improving nutritional literacy, land use, and local food diversification, communities are expected to intensify balanced nutritional consumption practices, which play a role in reducing stunting rates. These results demonstrate that the knowledge intervention, which included brochures and direct material delivery, was highly effective in increasing respondents' knowledge significantly (over 80%).

ACKNOWLEDGMENTS (OPTIONAL)

This research can be held and completed because the funding from the Ministry of Education and Culture, Research and Technology for 2024, with Matching Fund program.

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