

Empowering Cadres in Stunting Prevention through Training on Making Weaning Food Ice Cream based Yellow Pumpkin in Sumberejo Ambulu Jember

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Abstract

Stunting is a growth problem in children who have a length or height that does not match their age. One way to prevent stunting is to meet nutritional intake in children under five in the form of fulfilling exclusive breastfeeding for children less than 6 months and breast milk and MP-ASI (complementary food for breast milk) for children aged 6 months and over. Community service activities carried out in Sumberejo, Ambulu, Jember are stunting counseling to prevent stunting of children's physical and cognitive abilities and training related to increasing innovation in the management and presentation of MP-ASI (Complementary Feeding Food for Toddler). The purpose of this service activity is to increase knowledge and skills in making MP-ASI in the form of pumpkin ice cream made from local ingredients and is liked by toddlers. Based on the results of the pre-test and post-test on public knowledge and awareness of stunting, it was shown that there was an increase in knowledge of 23.8%, 71.42% did not experience a change in knowledge, and 4.76% experienced a decrease in knowledge. Therefore, it can be concluded that the people of Sumberejo Village, Ambulu District, Jember Regency already have good knowledge and awareness about stunting yet still the provision already given can contribute to increasing their knowledge.

Keywords : stunting; weaning food; yellow pumpkin; ice cream

1. Introduction

Stunting according to Government Regulation of the Republic of Indonesia number 72 of 2021 is a condition of stunting or short growth in children under five years of age. Repetitive infections and chronic malnutrition are analyzed as causes of stunting, especially during the golden period of the child, namely the first thousand days of life (1000 HPK) which starts from the fetus until the child is two years old. Based on the Regulation of the Minister of Health number 1995/Menkes/XII/2010, stunting is enforced if the results of the child's anthropometric examination plot on the growth curve show that the point is below the standard

deviation of minus two from the calculation of the average height of children of their age (TNP2K, 2019).

Indonesia is a country with a high prevalence of stunting which ranks 108th out of 132 countries and ranks second highest in Southeast Asia, after Cambodia (International Food Policy Research and Institute, 2016). Although in fact this can be biased because the z-score used as a benchmark comes from WHO, several studies such as by Flynn et al. (2020) prove WHO measurement is not suitable for Asian children, including Indonesians. This higher prevalence still needs to be evaluated yet this remains to encouraging efforts to increase national awareness through the handling and prevention of stunting in order to increase the significance of reducing stunting in the area so as to improve the welfare of toddlers as the next generation of the nation.

According to the Central Statistics Agency (2019), Jember Regency has a prevalence of stunting under five of 37.94% and is ranked second in East Java. Sumberejo Village is one of the areas in Jember Regency where it turns out that until now there have been no cases of stunting under five. Considering that Jember Regency has a very high prevalence of stunting with a large population, it is necessary to carry out research and community service in the Sumberejo Village, regarding assistance with stunting phenomena and prevention of stunting through counseling and training in making MPASI with attractive presentations using local ingredients.

Based on data from the Task Force for the Acceleration of Handling and Overcoming Stunting in Sumberejo Village, that as of January 2022, Sumberejo Village has 92 health posts, there are 558 toddlers, 927 children aged 2-6 years, 141 pregnant women, 48 postpartum women, 0 with KEK (lack of chronic energy), and 0 with high risk.

The management of nutritional intake is important as an effort to prevent stunting in toddlers. The stunted growth can continue if the child does not get enough nutrition. Stunting has long-term effects, which can affect children's cognitive development, affect economic productivity as adults and also affect maternal reproductive outcomes (Hara, et al., 2021). Management that is not good can cause health problems in children until they are adults and can directly or indirectly affect the progress of a country. This is related to decreased cognitive development, impaired concentration, and inhibited learning achievement and decreased productivity by 20-30%, which will lead to a lost generation, where these children live but cannot do much good in the field of education, economy, education, and others, thereby affecting their future (Supariasa, et al., 2016; Hara, et al., 2021). This is supported by the results of an analysis by the World Bank which states that the problem of stunting and other nutritional problems is estimated to reduce the gross domestic product (GDP) by around 3% per year (World Bank, 2014). Nutritional intake for toddlers includes exclusive breastfeeding (breast milk), that is, babies only eat from breast milk until the baby is 6 months old and then continued by adding MP-ASI (complementary food for breast milk) until the child is 2 years old. The World Health Organization (WHO) and the Indonesian Pediatrician Association (IDAI) recommend giving MP-ASI to babies when they are 6 months old. During the MP-ASI period, the baby is slowly trained to prepare it to consume family food. The transition period from exclusive breastfeeding to consumption of family food occurs when the baby is around 6-23 months old. This period is a critical period for optimal growth and development of the baby (Haindita, 2020).

Provision of MP-ASI must be given appropriately so that it has a good impact and can meet the nutritional needs of toddlers. The World Health Organization (WHO) recommends four strategies for good complementary feeding, including timely, adequate, safe and responsive delivery. On time means that MP-ASI is given when breast milk alone is not enough to meet the baby's needs. In general, since the baby is six months old, breast milk alone is not enough to meet the needs of the baby's macro-nutrients and micro-nutrients. At this time there is an energy gap that increases as the baby gets older, so that it cannot be fulfilled only from breast milk. Therefore, the fulfillment of infant nutrition must be assisted with MP-ASI to prevent developmental and growth disorders. In addition, the provision of MP-ASI must be adequate, which means that MP-ASI must contain complete and balanced nutrition, be able to meet the needs of macronutrients (macronutrients) such as carbohydrates, fats and proteins, as well as micronutrients (micronutrients) such as

vitamins and minerals. mineral. Adequacy of MP-ASI can be seen through the amount, frequency, consistency, and variety of food. The third principle of giving MP-ASI is safe and hygienic. This means, starting from the process of preparing, making, and serving MP-ASI, you must use safe and hygienic methods, materials, and tools by paying attention to cleanliness, separating raw materials from cooked ingredients, paying attention to maturity, temperature, and storage time for MP-ASI. (do not leave food for more than 2 hours at room temperature), and pay attention to the cleanliness of the water for cooking in each process. The last principle is to provide MP-ASI responsively, meaning that MP-ASI is given consistently according to the child's hunger or fullness signals. Giving MP-ASI begins with interaction between the baby and the mother or caregiver who feeds it, but as they get older, the baby is encouraged to eat alone. The process of eating follows the rules and does not force the baby. Make sure the baby's meal schedule is regular, with a duration of less than 30 minutes for each meal, and no snacks are offered outside of the meal schedule, create a pleasant environment when eating, and without distractions (Haindita, 2020).

Providing MP-ASI needs to cover the four principles above. Making MP-ASI must use ingredients that have nutritional value. MP-ASI can be prepared from eggs, fish, vegetables or fruits, and another high animal products are good for preventing stunting (Sekiyama et al. 2015). When making complementary food, mother have to choose the ingredients carefully because there is a study which found that babies with home made complementary foods are more prone to iron deficiency than commercial synthetic products consumer (Irawan et al., 2019). One of the ingredients that can be used to make MP-ASI is pumpkin. Yellow pumpkin (*Cucurbita moschata*) is a good choice of material for making complementary foods because apart from having a complete nutritional content and rich benefits, pumpkin has a relatively low price and is easy to find in the community. Pumpkin is rich in glucose and poor in siloglukan. Pumpkin fiber can lower the sugar composition. This can shape the structure of the baby's gut microbiome and optimize food metabolic activity (Parker, et al., 2021). Intestinal bacteria also play a major role in the regulation of metabolism, absorption of iron, detoxification of drugs and synthesis of vitamins and bioamines (Milani, et al., 2017). According to Yoko (1996) in Wahyuni et al. (2018), that the pumpkin plant has many health benefits, namely as an increase in children's appetite, improving high blood pressure, preventing bladder disorders, curing stomach ulcers, improving dull skin, and eliminating black spots. In addition, pumpkin also contains antioxidants as an antidote to free radicals and cancer. The nature of pumpkin is soft and easy to digest and contains quite high carotene (pro vitamin A), and can add to the attractiveness, especially the color of food (Yoko (1996) in Wahyuni et al. (2018); Sari, et al., 2017).

In addition to paying attention to the nutritional content, it is also important to pay attention to the aesthetics of presentation when preparing MP-ASI. The presentation of MP-ASI must be made as attractive as possible so that toddlers are interested in eating and it is hoped that it can increase toddlers' responsiveness during the feeding session. One of the efforts to add to the preferences and enjoyable eating atmosphere for toddlers is to serve MP-ASI in the form of ice cream. Ice cream is a semi-solid culinary mixture that is usually consumed as a snack. All age groups, from children to adults, love ice cream because of its savory and soft taste. Ice cream is one of the foods with high nutritional value (Saputri, et al., 2015). Milk is the main ingredient for making ice cream (Hartatie and Khotimah, 2012). Ice cream is made with a composition of milk which reaches 60% of the total dry matter. The main elements in ice cream are milk fat, nonfat milk solids (skim), granulated sugar, flavor enhancers, emulsifiers, and stabilizers (Saputri, et al., 2015). Ice cream can be made using a variety of nutritionally valuable ingredients, such as pumpkin. Pumpkin ice cream is a new innovative product, which makes pumpkin a substitute for making ice cream. The use of pumpkin in the manufacture of ice cream can increase the amount of non-fat solids thereby reducing the fat content in ice cream and providing a distinctive aroma and increasing nutritional value, especially alpha carotene (Nurdjannah, et al., 2010). So far, people only know about traditional pumpkin processing, for example compote, wajit, dodol, candied or even just steamed (Wahyuni, et al., 2018). However, pumpkin which is processed into ice cream is still not widely known by the public, especially cadres. Strengthening the ability

of cadres in terms of education and motivation is very important because they are agents who are directly related to mothers of toddlers.

2. Methods

This community service is carried out based on an analysis of research results and discussions with village officials who are responsible for the stunting problem, namely Mr. Riyono Hadi as the Village Head, Mr. Huda as the Village Secretary, Mr. Sofyan as Chair of the Task Force (Officer Unit) for the Acceleration of Handling and Overcoming Stunting in Sumberejo Village, Mrs. Ani as Chair of the Cadre, Mrs. Wiwin as Assistant to the Village Family Planning Advisor (PPKBD) Sumberejo and her staff, which includes the Chairperson of the PKK, Mrs. Head of Sumberejo Village.

The implementation method for community service through the Airlangga University Community Learning Real Work Lecture program is counseling and training so that it is hoped that the local community can increase awareness of the importance of stunting detection and prevention, and actively develop their potential to innovate in making MP-ASI in order to fulfill toddler nutrition in Sumberejo Village. Activities carried out using descriptive analytical method. Community service activities were carried out on August 25 2022 which took place in Sumberejo Village, Ambulu District, Jember Regency. The activity participants were PKK women and Sumberejo Village cadres. This activity was carried out in several stages, namely preparation, implementation and evaluation.

The activity stages include: (1) the preparation stage. Conducting site surveys, discussions with local village officials, carrying out the permitting process to activity locations. (2) implementation stage. the event begins with participant registration, opening, pre-test before the counseling event takes place, delivery of counseling material on stunting which includes definitions, prevalence, causes, characteristics and ways of preventing stunting, especially in the aspect of fulfilling toddler nutrition, and material regarding MP-ASI including definitions, time, and the principle of administration, as well as a demonstration of making a complementary breastfeeding variation in the form of pumpkin ice cream, along with an explanation of the nutritional adequacy figures. Furthermore, discussions, post tests, training and demonstrations on the manufacture of MP-ASI were carried out. (3) monitoring and evaluation. Monitoring is carried out directly during counseling and training by looking at the interactions between participants and the extension speakers and their liveliness during the activity. The evaluation was carried out by assessing the increase in knowledge through pre-test and post-test questionnaires related to stunting and MP-ASI material. Evaluation is carried out to find out the participants' response to the implementation of this community service activity.

The ingredients used in making ice cream in this activity include pumpkin (pumpkin pulp), full cream milk, sugar, salt to balance the taste, and cornstarch as a stabilizer. Here are the steps for making pumpkin ice cream, which is to prepare the pumpkin puree first. Fresh yellow pumpkins are sorted, cleaned and removed the skin, jonjot, and pumpkin seeds (Sari, et al., 2017). Then the pumpkin is washed, and cut into cubes. Then the pumpkin pieces are steamed for 20 minutes. After that, the pumpkin is put into a blender without adding water, then mashed until it really becomes pumpkin puree (Fatma, 2015; Wahyuni, et al., 2018). The ingredients for making ice cream are prepared and weighed according to the formula, namely 500 ml full cream milk, 100 g sugar, 5 grams salt and 2 tbsp cornstarch. Furthermore, these ingredients are mixed with 200 g of pumpkin puree. The ice cream mixture is then cooked for 15 minutes until it boils. Then, cool down for 10 minutes at room temperature, and then put the resulting ice cream into a cup and store it in the freezer for 24 hours (Wahyuni, et al., 2018). The process of making pumpkin ice cream is very easy and does not require difficult equipment, and can be used as an effort to meet the nutritional needs of toddlers because pumpkin ice cream is a source of complex carbohydrates and is rich in calcium and vitamin A.

3. Result and Discussions

Community service to increase knowledge related to the identification and prevention of stunting is carried out by presenting material in a short and concise manner, in easy-to-understand language, with visualization using a projector. Before carrying out the activity, a pre-test was carried out first to determine the level of knowledge of the participants regarding the material to be provided. One of the intervention efforts made by the government in reducing the stunting rate is by promoting nutritious ASI and ASI Complementary Food. Health promotion can be carried out by counseling using various methods and media that are adapted to the target situation and conditions. One of the effective counseling methods is the group approach using lecture and demonstration methods. In the lecture and demonstration method, a process of changing behavior in the expected direction can occur through the active role of the target (Ministry of Agriculture, 2007; Ade, 2020). Counseling aims to overcome problems in the local community, namely the lack of knowledge about the stunting phenomenon so that they have not interpreted the results of toddler measurements accurately.



Fig.1. Yellow pumpkin ice cream as complementary food demonstration training

According to information from the Task Force for accelerating stunting reduction in Sumberejo Village, no stunting cases have been found in Sumberejo Village to date, while based on 2019 Central Statistics Agency (BPS) data, Jember Regency has the second highest prevalence of stunting in East Java, which is 37.94%. This counseling and training activity is intended to increase awareness and knowledge about stunting and innovation in making MP-ASI. Very well said that giving education has proven lead to an increasing knowledge of women to preventing stunting more early (Sari et al., 2021).



Fig. 2. Provision of stunting detection material

The response of the participants to this community service activity was very good, as indicated by the evaluation results before and after the activity. The evaluation is intended to find out the increase in participants' understanding. Therefore, the participants filled out the pre-test and post-test questionnaires to determine the level of understanding before and after the counseling was carried out. Based on the pre-test and post-test evaluations which can be seen in Table 1, the results obtained were that PKK mothers and cadres in Sumberejo Village, Ambulu District, Jember Regency, East Java, in general experienced an increase in knowledge about stunting and MP-ASI as indicated by an increase in average the total value of the questionnaire, which was originally an average value of 68.10 increased to 70.48.

Table 1. Distribution of Increased Knowledge of Communities Participating in Counseling on Prevention of Stunting and MP-ASI and Training on Making MP-ASI in Sumberejo Village

Knowledge Measurement	Score	Mean
Pre-test	1430	68,10
Post-test	1480	70,48

The results of the pre-test and post-test based on the percentage of 21 extension participants obtained results, as many as 5 participants had an increase in knowledge (23.8%), as many as 15 people had a constant or fixed knowledge value (71.42%), and 1 people experienced a decrease in knowledge after being given counseling (4.76%). This is because some participants arrived late, so they did not get complete information. The results of community service activities through counseling and demonstrations found that participants were satisfied both with material counseling, training, and MP-ASI demonstrations.

In the beginning, the majority of residents of Sumberejo Village, Ambulu District, Jember Regency, knew about stunting and toddler nutritional intake, including MP-ASI, but after counseling there was an increased understanding of the complexity of the material provided. Based on the results of the pre-test, post-test, interviews, and direct observation during the activity, this community service activity gave the following results: (1) increased community knowledge and understanding to identify stunting phenomena, (2) increased community knowledge and understanding related to efforts to prevent stunting, and the importance of preventing stunting more strictly, (3) increasing public knowledge and understanding of strategies for giving good MP-ASI according to WHO and processing MP-ASI variations that are popular with children.

Cadres gained additional insight into innovations in processing local ingredients in the form of pumpkin into MP-ASI, as well as innovations in serving MP-ASI in the form of ice cream which are popular with toddlers as a means of increasing the principle of giving MP-ASI, namely increasing the responsiveness of toddlers during feeding sessions. Participants were very enthusiastic about the activity from start to finish. During the training session, the participants actively asked and listened carefully, and the participants were given ice cream from the finished training so that they could know and experience directly processed pumpkin as ice cream. The process of making pumpkin ice cream is very easy and does not require difficult equipment, and can be used as an effort to meet the nutritional needs of toddlers because pumpkin ice cream is a source of complex carbohydrates and is rich in calcium and vitamin A.

4. Conclusion and Suggestion

This community service provides knowledge to PKK cadres and mothers in Sumberejo Village by means of counseling and training in Sumberejo Village, Ambulu District, regarding the importance of awareness regarding the identification of the phenomenon of stunting in children and prevention of stunting cases, the principles of giving MP-ASI and processing pumpkin as an ingredient. Making MP-ASI and

serving variations of MP-ASI in the form of ice cream as an alternative to increase the responsiveness of toddlers when fulfilling nutritional intake so that there is an increase in the welfare and health of toddlers in Sumberejo Village. Through the implementation of this community service activity, there has been an increase in knowledge about stunting and MP-ASI. The increase in pre-test and post-test evaluation results shows that the complexity of the community's knowledge regarding stunting and complementary breastfeeding has increased. This will help the community in increasing responsiveness to fulfilling toddler nutrition and children's standard of living.

Community service is expected to increasing their knowledge of stunting and MP-ASI. Empowered cadre is urgently needed to improve the level of health and well-being of toddlers in Sumberejo Village, Ambulu District, Jember Regency in particular and throughout Indonesia in general. Contributions to efforts to accelerate reduction, prevention and treatment of stunting require assistance from across sectors. Therefore, it is necessary to increase awareness and contribution from each field.

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References

- Ade. 2020. Pengaruh Penyuluhan Gizi Terhadap Perubahan Pengetahuan dan Perilaku Ibu Dalam Pemberian MP-ASI. *Jurnal Ilmu Gizi Indonesia (JIGZI)*, 1(1), pp. 38–46. Available at: <http://jurnal.umitra.ac.id/index.php/JIGZI/article/view/325>.
- Badan Pusat Statistik. 2019. Prevalensi Balita Sangat Pendek dan Pendek pada Kabupaten/ Kota SSGBI. Badan Pusat Statistik.
- Departemen Pertanian. 2007. Rekomendasi Pemupukan N, P dan K pada Padi Sawah Spesifik Lokasi. Peraturan Menteri Pertanian Nomor 40/ Permentan / OT. 140/04/2007. Departemen Pertanian, Jakarta
- Flynn J, Alkaff FF, Sukmajaya WP and Salamah S. 2020. Comparison of WHO growth standard and national Indonesian growth reference in determining prevalence and determinants of stunting and underweight in children under five: a cross-sectional study from Musi sub-district [version 2; peer review: 2 approved]. *F1000Research* 2020, 9:324 (Accessed online 29/12/2 at <https://doi.org/10.12688/f1000research.23156.2>)
- Hanindita, M. 2020. Mommyclopedia: 78 resep MPASI. p.144.
- Hara, M. K., Namuwali, D., Nyoko, Y. O., Febriyanto, D. 2021. Desa Bebas Temu Gizi Kurang. Edukasi Masyarakat Sehat Sejahtera (EMaSS): Jurnal Pengabdian kepada Masyarakat. *Jurnal Pengabdian Kepada Masyarakat*, 3(2), pp. 73–79. Available at: <http://ejournal.poltekkestasikmalaya.ac.id/index.php/EMaSS/index>.
- Hartatie, E. S. and Khotimah, K. 2012. Produksi Minuman Fungsional Berbasis Susu dan Labu Kuning: Strategi Pengembangan Ketahanan Pangan, *Jurnal Gamma*, 7(2), pp. 23–33. Available at: <http://ejournal.umm.ac.id/index.php/gamma/issue/view/238/showToc>.
- International Food Policy Research and Institute. 2016. Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030. International Food Policy Research Institute (IFPRI).
- Irawan, R., Widjaja, N. A. and Hanindita, M. H. (2019) "Effect of Different Complementary Feeding on Iron Deficiency

- Anemia and Growth in Breastfed Infants: Home-Made VS Commercial”, *Folia Medica Indonesiana*, 55(2), pp. 112–116. doi: 10.20473/fmi.v55i2.24594.
- Milani, C., Duranti, S., Bottacini, F., Casey, E., Turrone, F., Mahony, J., Belzer, C., Palacio, S.D., Montes, S.A., Mancabelli L., Lugli, G.A., Rodriguez, J.M., Bode, L., Vos, W.d., Gueimonde, M., Margolles, A., Sinderen, D.V & Ventura, Marco. 2017. The First Microbial Colonizers of the Human Gut: Composition, Activities, and Health Implications of the Infant Gut Microbiota. *Microbiology and Molecular Biology Reviews*, 81(4).
- Nurdjannah, N., Usmiati, S. and Budiyanto, A. 2010. Karakteristik Es Krim Labu Kuning (*Cucurbita moschata*) Menggunakan Pengemulsi Pati Jagung (*Zea mays L.*) dan Pati Garut (*Maranta arundinacea L.*), *Jurnal Pascapanen*, 7(1), pp. 43–52.
- Parkar, S.G., Frost, J.K.T., Rosandale, D., Stoklosinski, H.M., Jobsis, C.M.H., Hedderley, D.I., & Gopal, Pramod. 2021. The sugar composition of the fibre in selected plant foods modulates weaning infants gut microbiome composition and fermentation metabolites in vitro. *Scientific Reports*, 11(1), pp.1–15.
- Saputri, O. M., Tjaronosari and Wijanarka, A. 2015. Variasi Pencampuran Tepung Labu Kuning sebagai Bahan Penstabil Es Krim Ditinjau dari Sifat Fisik, Organoleptik dan Kadar Beta Karoten. *Jurnal Nutrisia*, 17(2), pp. 101–107.
- Sari, G. M. 2021. Early Stunting Detection Education as an Effort to Increase Mother’s Knowledge about Stunting Prevention, *Folia Medica Indonesiana*, 57(1), pp. 70–75. doi: 10.20473/fmi.v57i1.23388.
- Sari, N., Widanti, Y. A. and Mustofa, A. 2017. Karakteristik Es Krim Labu Kuning (*Curcubita moschata*) dengan Variasi Jenis Susu. *Jurnal Teknologi dan Industri Pangan*, 2(2), pp. 95–102.
- Sekiyama M, Jiang HW, Gunawan B, Dewanti L, Honda R, Shimizu-Furusawa H, Abdoellah OS, Watanabe C. Double Burden of Malnutrition in Rural West Java: Household-Level Analysis for Father-Child and Mother-Child Pairs and the Association with Dietary Intake. *Nutrients*. 2015; 7(10):8376-8391. <https://doi.org/10.3390/nu7105399>
- Supariasa, I., Bakri, B. and Fajar, I. (2016) *Penentuan Status Gizi*. 2nd edn. Jakarta: EGC. Penerbit Buku Kedokteran.
- Tim Nasional Percepatan Penanggulangan Kemiskinan (TNP2K). 2019. *Strategi Nasional Percepatan Pencegahan Anak Kerdil (Stunting) Periode 2018-2024* 2nd ed., Jakarta Pusat.
- Wahyuni, Y., Ansharullah and Faradilla, R. F. 2018. Pengembangan Es Krim Labu Kuning (*Cucurbita moschata* Durch) yang Diformulasi Kacang Kedelai (*Glycine max L. Merrill*) sebagai Pangan Fungsional. *Jurnal Sains dan Teknologi Pangan*, 3(3), pp. 1435–1447.
- World Bank. 2014. *Better Growth Through Improved Sanitation and Hygiene Practices. Water Supply and Sanitation in Indonesia Turning Finance into Service for the Future*. (May), pp.1–88.