



Training on preparation of balanced nutrition and healthy food creativity to increase nutrition intake of school children during the Covid-19 pandemic

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ARTICLE INFO	ABSTRACT
<p>Article history Received: 2023-05-16 Revised: 2023-05-17 Accepted: 2023-05-31 Published: 2023-06-20</p> <p>Keywords Education Training Nutrition School-aged children</p>	<p><i>The school aged students are vulnerable people to have nutritional problems particularly in this Covid 19-Pandemic era. This pandemic put children on the risk of nutritional problems, both malnutrition and obesity. Mothers are the closest person who have important role in providing children's diet. Therefore, the purpose of this community service's program is to increase the knowledge and attitude of mothers in providing menu that meets nutritional balance for school-age children. The target of the program was the women of Kualu village, Tambang district, Riau Province with school-age children. The method used in this program were the provision of nutrition education based through counseling/lectures, training and demonstration. The results of the program showed that the level of mother's' knowledge increased to 10.37 and 19.88 points. Furthermore, the mothers' creativity in providing the balanced diet also improved. The training also stimulated mothers to find new menus which mainly ingredients come from surrounding environment that meet nutrients need among school aged children. Therefore, the nutrition education program has been proved effective in increasing mothers' knowledge and creativity. Hence this program can be used as an additional program in Posyandu to optimize children nutritional status.</i></p>
<p>Kata Kunci Anak usia sekolah Nutrisi Pendidikan Pelatihan</p>	<p>Pelatihan penyusunan gizi seimbang dan kreasi makanan sehat untuk meningkatkan asupan gizi pada anak sekolah selama masa pandemi Covid-19. Siswa sekolah dasar merupakan kategori penduduk yang beresiko mengalami masalah nutrisi. Pandemi Covid-19 telah mengubah pola konsumsi makanan keluarga yang menyebabkan anak mengalami risiko masalah nutrisi baik itu nutrisi kurang ataupun lebih. Ibu adalah orang terdekat dari anak dan berperan penting dalam membentuk pola makan anak. tujuan dari kegiatan pengabdian ini adalah meningkatkan pengetahuan, pemahaman dan kreativitas Ibu dalam penyediaan makanan yang memenuhi keseimbangan gizi. Sasaran kegiatan adalah Ibu-ibu desa Kualu, Riau yang memiliki anak usia sekolah. Metode yang digunakan dalam pengabdian ini adalah pemberian edukasi gizi melalui penyuluhan/ceramah, pelatihan menyusun gizi seimbang, dan demonstrasi kreativitas menu. Hasil program menunjukkan adanya peningkatan pengetahuan dan keterampilan ibu sebelum dan sesudah diberikan edukasi dengan peningkatan skor rata rata 15.39 dan 19.88 point. Selain itu kreativitas ibu dalam penyusunan gizi seimbang juga meningkat. Pelatihan juga merangsang kemampuan ibu dalam menciptakan menu baru yang bahan dasar utamanya berasal dari lingkungan sekitar. Berdasarkan hal ini terbukti bahwa edukasi dan pelatihan gizi efektif untuk meningkatkan pengetahuan dan kreativitas ibu dalam penyediaan gizi seimbang pada anak sekolah. Oleh karena itu program edukasi dan pelatihan gizi pada Ibu bisa dijadikan salah satu program di posyandu dalam rangka mengoptimalkan gizi anak sekolah.</p> <p style="text-align: right;">Copyright © 2023, Syafis et al This is an open access article under the CC-BY-SA license</p> <div style="text-align: right;">  </div>

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INTRODUCTION

Elementary school students are a category of population at risk of experiencing nutritional problems which will ultimately affect their health status (Blodgett & Lanigan, 2018). This is because children's diet and growth periods require higher nutritional intake than other age groups. Good nutritional status will affect children's growth and development abilities, especially their intellectual abilities. In addition, nutritional status also affects the child's immune system in fighting disease, especially Covid 19 in this pandemic era.

Since 2019, the covid-19 pandemic has affected various sectors of human life including health problems. In school-age children, the most serious risk is not only contracting the disease but having other collateral impacts such as nutritional problems (Ares, G., Bove, I., Vidal, L., Brunet, G., Fuletti, D., Arroyo, Á., & Blanc, 2020). The nutritional problems caused include malnutrition or malnutrition and obesity or excess nutrition (Zemrani, Gehri, Masserey, Knob, & Pellaton, 2021). This is because during the Covid 19 pandemic the pattern of family food consumption changed (Sandi Wachyuni & Wiweka, 2020). One of the reasons for changing family consumption patterns is financial difficulties which have caused some families to lose their income, forcing families to change their eating patterns. Families tend to adjust their daily consumption to their financial circumstances, such as choosing cheaper foods without paying attention to the nutritional balance they contain (Headey et al., 2020). On the other hand, families with more stable incomes tend to consume more fast food, fatty foods and drinks with high sugar content for more effective and efficient reasons (Popkin, Adair, & Ng, 2017). This resulted in children with family backgrounds with stable incomes tending to suffer from obesity during the pandemic (Ruiz-Roso et al., 2020). Obesity is also triggered by a lack of exercise in children during a pandemic (Sum et al., 2022). Other research also proves that during the Covid 19 pandemic, consumption of fruits and vegetables among children in developing countries decreased by 41.4%. (Sharma et al., 2020). The main factors that influence this condition are the mother's ability and knowledge about nutrition (Fadare O, Amare M, Mavrotas G, Akerele D, & Ogunniyi A, 2019).

Optimal nutrition plays an important role in increasing the cognitive, psychological and immune growth of school-age children (Saragih, L., Hasanah, O., & Huda, 2015). Therefore, the provision of correct nutrition, both in terms of quality and quantity, must be fulfilled for school-age children through the arrangement of foods that are well nutritious, balanced and of various types (Story, Kaphingst, & French, 2006). Another thing that is no less important is that the food served is safe from hazardous materials such as the use of Food Additives (BTP), excessive preservatives and benzoates, misuse of dyes and formalin not for food and microbial pollution. Based on data on safety snacks for school children, it is known that almost 57.8 percent of elementary school children tend to choose unhealthy snacks (Iklima, 2017). This snack habit should be a common concern because based on the results of research during the Covid-19 pandemic, almost 40% of children in the world reported consuming three more snacks than usual (Headey et al., 2020). Therefore, the role of parents, especially mothers, is very important in providing food for school children, especially in maintaining food safety and perfect nutritional balance (Schuster, Szpak, Klein, Sklar, & Katherine, 2019). This is supported by the results of previous research which proves that there is a relationship between the role of the mother and the nutritional status of children (N Huda & Safri, 2016).

Nutrition education is an effective way to address the nutritional problems of school children and has long-term effects (Hosseinzadeh, 2022). Nutrition education for mothers is the right way to create long-term healthy eating patterns that will improve the nutritional status and welfare of children for the future (Rahadiyanti et al., 2022). Education does not only involve increasing a mother's knowledge or cognitive skills, but also increasing her skills and creativity in preparing food. A study states that nutrition education for mothers and school-age children is proven to be able to increase children's willingness to consume healthy foods, vegetables and fruit in children in developing countries (Nugraha, Ilmi, & Patima, 2021).

In addition to mother's knowledge about balanced nutrition, a mother's ability to prepare food also affects children's nutritional status. The attractive appearance of a food also influences children's nutritional intake. A recent systematic review and meta-analysis study proves that foods that vary in shape and appearance are more attractive and are proven to be more liked by school-age children (Nathan et al., 2019). Recent research states that special education is needed for parents to help them choose and combine food for school children that meets 1/3 of the RDI (Recommended Daily Impact) needs for all the nutrients needed for growth and development and improving children's academic abilities (Onoja, Iloeje, Onoja, & Uzor, 2019). This is supported by previous research in Riau Province, that there is a relationship between mother's knowledge and child's nutritional status (Nurul Huda, 2016). In addition, the attitudes and behavior of mothers in providing food to school-age children also affect eating patterns and the selection of main foods and snacks for school-age children (Nurul Huda, 2016).

The paper aims at exploring how the continued training can accelerate and strengthen mother's knowledge and attitude in providing menu that meets nutritional balance for school-age children. During this pandemic balanced nutrition in school children is very important both in terms of quantity such as nutritional completeness, safety and variety of food forms as well as in terms of quality. Nurses as the spearhead of health workers in the community have obligations and responsibilities in improving the health status of the community, one of which is through improving the nutritional status of children. A child's good nutritional status will affect growth and development and the child's immune system so they can avoid various infections during this pandemic era. This pathway is aligned with one of the sustainable development target which are end all forms of malnutrition, including achieving, the internationally agreed targets on stunting and

wasting in children under 5 years of age, and address the nutritional needs of school-age children (World Health Organization, 2023). Hence, Education for mothers is the most effective way and has a long-term effect in optimizing children's nutritional status and the most effective way to educate the mother is continued training.

METHOD

The Community Partnership Program was carried out in the village of Kualu, Tambang District, Kampar Regency, Riau Province with the target group being mothers with school-age children. Partners in this service are the head of the Kualu village PKK and the Kuala village Posyandu. The Community partnership program activities consist of three series of activities which include nutrition measurement and education, training and creativity competitions. Nutrition education is carried out using the lecture/counseling method, discussion and question and answer. Training on choosing a balanced menu is carried out by inviting experts from the faculty of nursing and nutritionists as well as demonstrations and red-demonstrations. The last series of activities is a creativity competition in processing and discovering new types of food with the main source coming from plants or natural materials around.



Figure 1. Activity of measuring weight in elementary school-age children

In this community partnership program activity, education is carried out based on 5 (five) nutrition modules compiled by the service team with reference to the latest text books and journals, these 5 nutrition modules consist of Module 1: Go, Grow and Glow every Plate (explains the concept of 3 types of food on one plate, healthy food for school-age children, the importance of eating a variety of different colored fruits and vegetables); Module 2 : The colorful plate (Explain the various choices of vegetables and fruits that contain high nutritional value which can be easily found around the house); Module 3: Consume more protein (explains the various differences in protein and protein sources for the body; Module 4: Consume more nutrient-sources of energy, sweet and salty food (explains the various types of main energy-producing foods, explains alternatives to various types of food-producing main energy, explaining high-energy foods (dense food), high sugar and high salt. dosage of salt in types of food and the dangers of excess salt); Module 5: healthy beverages (explains the concept of water needs and their cycle in the body, the importance of fulfilling water needs for children's bodies, explaining the criteria and types of healthy drinks for children).

Education is carried out in two stages, namely general education which invites nursing and nutrition experts as well as tailored education where information needs are adjusted to the needs of the target individual through house-to-house counseling. In tailored education, target individuals are also given the opportunity to consult and share their problems and discuss a balanced menu. Demonstrations and re-demonstrations in training on a balanced nutrition menu are carried out by focusing more on food sources that are easy to find in the surrounding environment at affordable prices. Prior to demonstrations and red-demonstrations, the target community is given counseling in advance by presenting experts in the field of nutrition and care. Presentation of material on balanced nutrition, food substitution and how to create food is carried out using power point media, teaching aids, demonstrations and red demonstrations. The use of this type of method is proven to facilitate the participants' understanding and skills. In the counseling session, participants were taught how to prepare a balanced menu with the appropriate ingredients. One of the important things that must be considered by all participants is affordability in the provision of ingredients and main nutritional compositions such as carbohydrates, proteins, vitamins and minerals. Participants were also taught how to make food substitutions by first introducing food ingredients with the same nutritional content. Furthermore, the training also covers how to calculate calories and serve (plating) food. Demonstration and re-demonstration activities in compiling menus and creating food begins with determining ingredients that meet a balanced nutritional composition. In the village of Kualu, the utilization of cassava and potatoes as well as local major vegetables which are easy to grow in the village of Kualu is prioritized. At the end of the training session there was an open discussion and question and answer session with a two-way communication method so

that this session could accommodate the various aspirations and creations of the participants. All activities, both education and training, are carried out in the halls of mosques and social services while still paying attention to health protocols related to the spread of Covid-19.

Evaluation is carried out by measuring the level of knowledge of the mother about balanced nutrition and how to substitute food and measuring the practice of feeding by the mother. The evaluation tool used was a mother's knowledge questionnaire consisting of 30 questions and measuring eating practices by mothers consisting of 27 questions. Both questionnaires have been tested for validation before. The questionnaire consists of 30 questions. The pretest was taken before education was carried out. While the results of the posttest were carried out after training in balanced nutrition. Children's nutritional status is measured by looking at the child's body mass index (BMI). Data analysis used univariate test and bivariate test. The univariate test was carried out using a descriptive study which included percent and total. The bivariate test was carried out using the dependent t test.

RESULTS AND DISCUSSION

The results of the service showed that almost 100 percent of the participants involved were aged between 20-40 years, had education up to public high school (65.7%), did not work (74.3%) with family income generally above the UMR (77.1%). The nutritional status of children based on BMI in general is good (80%), bad (5.7%) and more (14.3%). The characteristics of the respondents are detailed in Table 1.

Table 1. The characteristics of the respondents

No	Characteristic of Respondent	Frequency (n)	Percentage (%)
1	Age		
	a. <20 years old	0	0
	b. 20-40 years old	35	100
	c. >40 years old	0	0
Total		35	100
2	Occupation		
	a. Working/employed	9	25.7
	b. Unemployed	26	74.3
Total		35	100
3	Education background		
	a. University	7	20
	b. Highschool	23	65.7
	c. Junior Highschool	3	8.6
	d. Elementary school	2	5.7
Total		35	100
4	Income		
	a. Above Minimum Rate	27	77.1
	b. Under Minimum Rate	8	22.9
Total		35	100
5	Genders		
	a. Females	16	45.7
	b. Males	19	54.4
Total		35	100
6	Child's nutritional status		
	a. Good	28	80
	b. Not bad	5	14.3
	c. Lack	0	0
	d. Bad	2	5.7
Total		35	100
7	Employment status		
	a. Honorary	62	88,6
	b. Civil servant	7	10
	c. Volunteer	1	1,4
Total		70	100

Based on the knowledge questionnaire, it was found that there was an increase in knowledge about balanced nutrition before and after community service activities of 10.37 points with a p value <0.001. So it is known that there is a significant difference between the level of mother's knowledge in providing a balanced menu to school-age children in the village of Kualu before and after community service on balanced nutrition (Table. 2).

Table 2. Differences in the level of mothers' knowledge before and after service activities

Paired differences		
Knowledge pre-post	Mean	-10.371
	SD	6.665
	Std Error Mean	1.127
	95% confidence interval of the difference	
	Lower	-12.661
	Upper	-8.082
	t	-9.207
	df	34
	Sig (2 tailed)	.000

Based on the mother's feeding practice questionnaire, it was found that there was an increase in the mother's ability to practice balanced nutrition before and after community service activities of 19.88 points with a p value <0.001. So that it is known that there are significant differences in the practice of giving food by mothers in providing a balanced menu to school-age children in Kualu village before and after community service activities (Table 3).

Table 3. Differences in the practice of feeding mothers before and after service activities.

Paired differences		
Pre-post child feeding practices	Mean	-19.886
	SD	12.911
	Std Error Mean	2.182
	95% confidence interval of the difference	
	Lower	-24.321
	Upper	-15.451
	t	-9.112
	df	34
	Sig (2 tailed)	.000

The majority of residents in Kuala Village work in Pekanbaru City with an income above the average Pekanbaru minimum wage. This is because the head of the family in the village of Kuala is a civil servant at a government institution or a private employee who works for a company in the city of Pekanbaru. Geographically, Kualu village is a village in the Tambang sub-district, Kampar district, which is located on the border between Pekanbaru city and Kampar district. Like other sub-urban areas in general, residents only live in the village of Kuala, but most of their livelihood activities are carried out in the city of Pekanbaru. Based on the results of community service, it is known that the age of most residents is in the range of 30-45 years. so it is not surprising that many residents in this area still have school-age children. In general, mothers in the village of Kualu do not work. The main job is a housewife who takes care of all family needs, especially children and the main breadwinner is the husband or head of the family.

The research results show that in general the nutritional status of school-age children in the village of Kualu is in good status. The nutritional status of a child can be determined using several growth indicators. Good nutrition will affect cognitive abilities and growth and development of school-age children. But what needs to be paid attention to the results of this service is that the problem of over nutrition has a greater percentage than the problem of under nutrition. This can be seen from the figures which show that the problem of over nutrition is almost 14.3%, where the percentage of undernutrition is at 5.3%. This is in accordance with the results of an international longitudinal survey in various parts of the world which states that the number of children aged 2 to 16 years who have experienced an increase in body mass index which is categorized as more nutritional has doubled during the pandemic when compared to the situation before the pandemic (Lange, et al, 2021). This survey confirms that the age that has experienced the most changes in excess nutrition is elementary school children.

During a pandemic, breaking the chain of the corona-19 virus became the government's focus. Therefore the Indonesian government issued various policies such as closing schools, playgrounds and other strategic public places. This resulted in changes in people's lifestyles which were originally more active outside to be more carried out indoors. These changes also occur in school-age children and cause various problems, one of which is changes in child nutrition. The Covid-19 pandemic has caused an increase in the risk factors for elementary school-age children experiencing excess nutrition because school-age children are required to stay at home and conduct school online. This causes the lifestyle of school-age children to experience quite significant changes, such as irregular eating patterns which are dominated by unhealthy foods (Lamping, 2023). Pietrobelli et al (2020) showed that consumption of high-energy foods increased in obese children

while their activity decreased during the COVID-19 epidemic. This is exacerbated by the tendency of children to overeat during this pandemic. This tendency to eat more is caused by a lack of entertainment and fun at home and the constant availability of food, so school-age children tend to eat more to fill their free time (Razi & Nasiri, 2022).

Another factor that causes the problem of over nutrition in children during the pandemic is the disruption of sleep patterns. During the pandemic, most school-age children slept too late and woke up later. This results in them skipping breakfast and eating more at midnight. In addition, a sedentary lifestyle, which is characterized by the consumption of fast food, dominates the child's diet. This situation is exacerbated by a lack of physical activity and increased screen time (Razi & Nasiri, 2022).

The inability of parents to control over nutrition in children is one of the factors in increasing the incidence of obesity in children (Sanyaolu, Okorie, Qi, Locke, & Rehman, 2019). Some research states that parents cannot control excess nutrition in children because children do not feel there is something wrong with their body shape. This is because during the pandemic, children's contact with their colleagues decreased, so they did not feel that being overweight was not something to be concerned about (Buchanan, Hargreaves, & Quick, 2022). Therefore, education for parents and changes in behavior and attitudes of parents in improving healthy lifestyles in children, especially in terms of balanced nutrition is absolutely necessary.

After going through several series of education, both tailored education, counseling and training, it can be seen that mothers' knowledge about balanced nutrition has increased significantly. Education is the addition of one's knowledge and abilities through practical learning techniques or instructions with the aim of remembering facts or real conditions. This is done by encouraging self-direction, actively providing new information or ideas. Providing education to mothers is proven to be able to increase knowledge of mothers and children about the importance of balanced nutrition. This is in accordance with previous research in Japan where the increase in knowledge of mothers and children was quite significant after being given structured education complete with direct demonstrations and demonstrations to mothers. This is because structured education allows more intense communication between mother and child (Asakura, Mori, Sasaki, & Nishiwaki, 2021).



Figure 2. Balanced nutrition education activities

Nutrition education is a very important part of efforts to improve community nutrition. Through structured education, mothers who have school children have more time to conduct counseling and learn more according to their needs so that the education provided can influence the level of knowledge and behavior in acting so that the behavior patterns that are formed change for the better. A higher level of knowledge about nutrition will cause a person to receive information about nutrition more easily. The knowledge possessed will stimulate an individual to do what is known about the proper way of providing nutritious food to children. Increasing knowledge if continuously stimulated will result in a person's desire to practice it in real life so that it will indirectly affect the nutritional status of children (Sukandar, Khomsan, Anwar, Riyadi, & Mudjanto, 2015).



Figure 3. The Assessment team of healthy food creativity competition

The results of the service show that the ability of the target community to create food and create new menus while taking into account the balance of nutrition and the use of affordable local ingredients is increasing. This can be seen by the discovery of 5 (five) types of new food creations that use cassava as the main ingredient. Cassava is a type of food that contains high nutritional value and can be found in the area around the village of Kuala. To increase children's appetite, this type of food made from cassava is made with other ingredients so that the complete nutrition of the food can be fulfilled and packaged in a form that attracts children's attention. Research proves that attractive food packaging will increase children's appetite (Kokaji & Nakatani, 2021). The types of food created by the creativity of the mothers who participated in this service were also modified in such a way that the taste and nutritional content during processing were maintained. The 5 types of food produced by these mothers and school children are: sweet potato croquettes filled with vegetables and fish, cassava omelette sprinkled with cobs, banana vegetable dumplings, cassava risol filled with chicken and vegetables, and cassava balls in durian sauce.



Figure 4. Product of creative healthy food creations of cassava croquettes filled with vegetables and cobs.

CONCLUSION

Nutritional problems are an important problem in school-age children. In school-age children, nutritional needs increase because they need energy to be active at school. Through community service that focuses on education to increase knowledge, skills training and attitudes of mothers in providing balanced nutritious food to children, there is an increase in mother's knowledge in providing balanced nutrition. Mother skills training using the demonstration method has also been proven to improve the skills and attitudes of mothers in providing a balanced menu for school-age children. Your creativity in modifying new menus has also proven to be well developed as evidenced by the discovery of 5 new types of food that meet the balanced nutrition of school-age children.

Therefore, in the future, collaboration and follow-up from Posyandu and Puskesmas are needed to control the nutrition of school-age children by involving parents/mothers. Follow-up can be in the form of recording nutritional problems at the Posyandu so that children's nutritional problems can be detected earlier and the need to increase nutrition optimization programs in the village environment by forming small groups of mothers where these small groups will share knowledge and skills of mothers on how to modify nutrition balance in school children. This group will also be intensively fostered and become the forerunner of child nutrition cadres in Kuala Village

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