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## RESEARCH ARTICLE

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# Knowledge of Health Cadres and Expected Food Patterns of Pregnant Women as Impact of Increasing the Capacity of Health Cadres

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## ABSTRACT

The prevalence of stunting in Malang City has decreased significantly, but the local government continues to commit to reducing it to 14% by 2024 and even zero stunting by 2030. This study aimed to analysis the effect of increasing the capacity of health cadres on their knowledge and the expected food patterns of pregnant women. This study implemented a one group pretest and posttest design. The interventions provided include increasing the capacity of health cadres and continuing assistance to the target for the first 1000 days of life. Impact variables were measured in the pretest and posttest phases, then comparative analysis was carried out using statistics method. The p-value for knowledge of cadres was 0,016 and there was an increase in the expected food patterns of pregnant women after being given the intervention. It was concluded that increasing the capacity of health cadres can increase their knowledge and improve the expected food patterns of pregnant women in Malang City.

**Keywords:** health cadres; capacity; child; stunting; development; intelligence

## INTRODUCTION

Stunting is a condition where the growth of children under five fails due to chronic malnutrition, especially in the first 1,000 days of life. Stunting is one of the nutritional problems faced in the world, especially in poor and developing countries. Indonesia is a country with a relatively high prevalence of stunting compared to other middle-income countries. The prevalence of stunting in children under five years old decreased from 37.2% in 2013 to 30.8% in 2018.<sup>(1)</sup> The prevalence of stunting in children under two years old also decreased from 32.8% in 2013 to 29, 9% in 2018. The prevalence of stunting in Malang City is 18%, meaning there has been a decrease from 2021, namely 25.7%. This figure is below the average for East Java Province (19.2%) and the national level (21.6%).<sup>(2)</sup> However, the challenge of accelerating stunting reduction is still quite large, namely 1) the proportion of heavy babies low birth weight (<2500 grams/LBW) increased from 5.7% in 2013 to 6.2% in 2018; 2) birth length less than 48 cm increased from 20.2% in 2013 to 22.7% in 2018; and 3) the proportion of complete basic immunization in children aged 12-23 months decreased from 59.2% in 2013 to 57.9% in 2018, while the proportion of children who were not immunized increased from 8.7% in 2013 to 9 .2% in 2018.<sup>(1,2)</sup>

Accelerating stunting reduction can be done by addressing the following problems: 1) the high number of pregnant women and toddlers who have not received additional food programs, respectively 74.8% and 59%; 2) an increase in the proportion of anemia in pregnant women from 37.1% in 2013 to 48.9% in 2018.

Therefore, stunting intervention in the first 1000 days of life is very important. The consequences of malnutrition in this phase are permanent and difficult to repair. The main cause of children experiencing stunting is nutritional intake. None of the research results show that heredity is a more important factor than nutrition in terms of a child's physical growth. Generally, people assume that physical growth is completely influenced by hereditary factors. This erroneous understanding often hinders the promotion of stunting prevention, which should be carried out with efforts to meet nutritional needs from the time a child is in the womb until the age of two years.

The Indonesian government has designated 100 districts/cities as priorities for handling stunting since 2017, of which Malang City is one of these priorities.<sup>(3)</sup> Efforts to eradicate stunting in Malang City continue to show significant results. In 2022, the Malang City Health Service reports that the stunting rate will drop drastically. This prevalence has met the standard for the prevalence of child growth and development problems set by the World Health Organization (WHO), namely 20% of total births. In general, stunting cases in Malang

City appear to be unequal in several sub-districts. Of the 5 sub-districts in Malang City, Blimbing Sub-district is the sub-district with the highest prevalence of stunting, and one of the sub-districts in Blimbing Sub-district is Jodipan Sub-District which has been designated as a stunting locus in 2022 with a prevalence of 23.27%. However, the Malang City Government continues to commit to reducing it to 14% by 2024 and even zero stunting by 2030. The locus of stunting in Malang City in 2022 will be 18 sub-districts spread across several health centers, namely Pandanwangi, Kendalkerep, Kedungkandang, Gribig, Arjowinangun, Bareng, Arjuno, Rampal Celaket, Kendalsari, Mojolangu, Janti, Ciptomulyo, and Mulyorejo.<sup>(4)</sup>

Health cadres are the main drivers of all community-based health service activities. The most basic problem is the low level of knowledge of cadres from an academic and technical perspective, so that to be able to provide optimal service, it is necessary to adjust knowledge and skills to be able to carry out activities according to norms, standards, procedures and service development criteria. This is in line with one research report which stated that 51.1% of health cadres did not receive information about stunting and 48.8% did not provide counseling to mothers of toddlers.<sup>(5)</sup>

This study aimed to analysis the effect of increasing the capacity of health cadres on their knowledge and the expected food patterns of pregnant women.

## METHODS

This research used a one group pretest and posttest design. The interventions provided were activities to increase the capacity of health cadres as agents of change through education and training on balanced nutrition, 4 pillars 10 messages, 40 hours of WHO breastfeeding counseling, PMBA, and anthropometry. The research was carried out in Jodipan Village, Kendalkerep Community Health Center Working Area, Malang City for 3 years, namely 2020 to 2022. The research sample was 30 health cadres as agents of change and 60 pregnant women until their children were over 24 months old (because the target for the first 1000 days of life was pregnant women, breastfeeding mothers, infants and children aged 0 to 24 months).

The pre-intervention stage aimed to find out data from the initial phase, including: 1) sample characteristics (age, gender, education and mother's occupation) obtained through filling out a questionnaire; 2) nutritional status according to body weight/height; 3) mother's knowledge about nutrition; 4) knowledge about feeding babies and children; 5) knowledge about caring for sick children; 6) knowledge about personal hygiene; 7) food intake through 3 x 24 hour recall.

The intervention stage included:

- 1) Increasing the capacity of health cadres as agents of change through education and training on balanced nutrition: 4 pillars 10 messages, breastfeeding counseling according to WHO 40 hours, PMBA, and anthropometry.
- 2) Assistance for the target of the first 1,000 days of life in three phases, namely: a) Intensive phase (targets are visited every day from day one to day seven); b) Strengthening phase (target visited twice per week for 1 week, from day 8 to day 14); c) Independent phase (for 2 weeks, on days 15 to 29 the target is not visited). On the 30th day, health cadres as agents of change assessed the assistance output. Monitoring the growth of babies and children aged 0-24 months is carried out at posyandu (integrated service post).

The post-intervention stage included collecting data on: 1) knowledge of health cadres; 2) expected food patterns of pregnant women (weeks 3 and 4).

Data on food consumption was converted into units of energy (calories) and nutrients using the 2019 Indonesian food composition table, taking into account the conversion of cooking raw materials and oil absorption. Energy and nutrient adequacy was calculated based on the recommended nutritional adequacy figures according to age and healthy body weight.<sup>(2)</sup> The expected food pattern method can produce a score that reflects the overall quality and diversity of food. Apart from that, the gap between consumption and food (energy) sufficiency in each food group can also be identified. There were nine food groups used to calculate expected food patterns, namely grains, tubers, animal foods, oils and fats, oily fruits/seeds, nuts, sugar, fruit and vegetables, and others. Food consumed in households came in various forms and types with different units, so conversion was carried out into the same units and types of commodities. Next, energy intake according to food groups per capita/day was calculated, and continued by calculating the expected food pattern score. Analysis of the relationship between variables was carried out by the Pearson correlation test for interval and ratio scale data and the Spearman correlation test for ordinal scale data.

## RESULTS

Increasing the capacity of health cadres as agents of change through education and training on balanced nutrition 4 pillars 10 messages, breastfeeding counseling according to WHO 40 hours, PMBA, and anthropometry showed an increase in knowledge as an effort to increase understanding and understanding of health cadres. The average knowledge score before the capacity increase was 63.0, then increased after the implementation of the capacity increase to 76.8 (Table 1). The results of the analysis show a p value = 0.016 so there was a difference in knowledge between before and after increasing capacity.

Table 1. Distribution of knowledge of health cadres as agents of change

Training on balanced nutrition	Knowledge		p
	Mean	SD	
Before	63.0	16.2	0.016
After	76.8	14.7	

Table 2. Distribution of respondents characteristics

Respondents characteristics	Category	Frequency	Percentage
Education	Elementary school	16	26.7
	Junior high school	36	60.0
	Senior high school	8	13.3
Age (years)	15-19	8	13.3
	20-24	16	26.7
	25-30	19	31.7
	≥30	17	28.3
Weight (kg)	40-49.9	7	11.7
	50-59.9	34	56.7
	≥60	19	31.6
Height (cm)	145-149.9	15	25.0
	150-154.9	28	46.7
	155-159.9	17	28.3
	≥160	0	0
Nutritional status	Thin	8	13.3
	Normal	42	70.0
	Fat	10	16.7
Pregnancy	1	25	41.7
	2	26	43.3
	>2	9	15.0

Table 3. Expected food patterns (EFP) of pregnant women before increasing the capacity of health cadres

Group of food	Actual				Standard			
	Energy	% energy	Weight	EFP score	Energy	% energy	Weight	EFP score
Grains	305	43	0.5	243.3	1075	50	0.5	25
Tubers	57	8	0.5	3.5	129	6	0.5	2.5
Animal food	89	12	2	22	258	12	2	24
Oil and fat	66	9	0.5	4	215	10	0.5	5
Oily fruit/seeds	29	4	0.5	1.5	64.5	3	0.5	1
Nuts	36	5	2	10	107.5	5	2	10
Sugar	50	7	0.5	3	107.5	5	0.5	2.5
Vegetable & fruit	35	5	5	25	129	6	5	30
Etc	52	7	0	0	64.5	3	0	0
Amount	716	100		73.3	2150	100		100

Table 4. Expected food patterns (EFP) of pregnant women after increasing the capacity of health cadres

Group of food	Actual				Standard			
	Energy	% energy	Weight	EFP score	Energy	% energy	Weight	EFP score
Grains	486.9	36.8	0.5	18.1	1075	50.0	0.5	25.0
Tubers	90.1	6.8	0.5	3.4	129	6.0	0.5	2.5
Animal food	145.6	11.0	2	21.6	258	12.0	2	24.0
Oil and fat	172.3	13.0	0.5	6.4	215	10.0	0.5	5.0
Oily fruit/seeds	88.0	6.7	0.5	3.3	64.5	3.0	0.5	1.0
Nuts	66.7	5.0	2	2.5	107.5	5.0	2	10.0
Sugar	50.3	3.8	0.5	1.9	107.5	5.0	0.5	2.5
Vegetable & fruit	74.4	5.6	5	28.0	129	6.0	5	30.0
Etc	148.3	11.2	0	0.0	64.5	3.0	0	0.0
Amount	1322.6	100.0		85.1	2150	100.0		100.0

Characteristics of third trimester pregnant women included age, education level, occupation, income level, and number of family members. Table 2 shows that the majority's education level was junior high school (60.0%). There were still 13.3% of pregnant women who were thin and 16.7% who had fat nutritional status. 85% of pregnant women were in the status of young couples with their first and second pregnancies.

The results of the analysis show that there was a qualitative increase in the food consumption patterns of pregnant women, which was indicated by an encouraging quality score for food consumption patterns. Table 3 shows that quantitatively the food consumption patterns of pregnant women in the third trimester before increasing the capacity of health cadres were in the very poor category (33.3%). Likewise, qualitatively, the EFP quality score shows 73.3 or only meets 79.24% of the standard, namely 90.4. Table 4 shows that the average EFP quality score for pregnant women in the third trimester after increasing the capacity of health cadres is included in the good category because it reaches 85.1 or meets 92.0% of the standard, namely 90.4. However, Table 4 also shows that the average food consumption pattern of pregnant women respondents has not paid attention to food diversification as indicated by the energy food group of grains (36.8%), tubers (6.8%), animal foods (11.0%), oils and fats (13%), oily fruit/seeds (6.7%), nuts (5.0%), vegetables and fruit (5.6%), etc. (11.2%) more lower than standard. In terms of quantity, the food consumption patterns of pregnant women are presented in Table 5.

Table 5. Dietary patterns (quantitative) of pregnant women before and after increasing the capacity of health cadres

Energy and nutrient	Energy and nutrient consumption levels								p
	Before increasing the capacity				After increasing the capacity				
	Consumption		%		Consumption		%		
Energy (calory)	716	±	271	65	1323	±	281	93	0.001
Carbohydrate (g)	199	±	54	69	270	±	26	93	0.035
Protein (g)	65	±	22	108	71	±	26	118	0.041
Fat (g)	31	±	13	44	62	±	18	90	0.027
Fe (mg)	6	±	3	40	10	±	5	69	0.019
Vitamin C (mg)	37	±	18	38	60	±	63	60	0.017

### DISCUSSION

Increasing the capacity of health cadres is an important strategy to increase their knowledge about the nutritional needs of pregnant women.<sup>(6-8)</sup> Health cadres are people who act as facilitators, motivators and community companions in the field of health, including nutrition.<sup>(6,7,9)</sup> By increasing their capacity through training, guidance and supervision, health cadres can provide appropriate and effective information, education and communication to pregnant women about the importance of balanced and nutritious nutritional intake.<sup>(6)</sup> This can help pregnant women to meet the nutritional needs of themselves and the fetus they are carrying, thereby preventing nutritional problems such as anemia, micronutrient deficiencies, or being overweight.<sup>(10-12)</sup> Apart from that, increasing the capacity of health cadres can also improve their ability to identify, refer and manage nutritional cases that require special attention, such as pregnant women with undernutrition, overnutrition or pregnancy complications. Thus, increasing the capacity of health cadres can contribute to improving the nutritional status of pregnant women and the health of mothers and children.<sup>(6-8)</sup>

Adequate nutrition for pregnant women is an important factor in preventing stunting in children. Stunting is a condition where a child's length or height is less than the age standard, which can have an impact on the child's physical and mental development in the future. Stunting can be prevented by ensuring adequate nutritional intake since pregnancy, especially protein, calcium, folic acid and iron. Apart from that, pregnant women also need to avoid infectious diseases, smoking, drinking alcohol and stress, as well as exercising regularly and having pregnancy check-ups. In this way, pregnant women can give birth to children with normal body length (above 48 cm) and prevent the risk of stunting in children.<sup>(13-21)</sup>

So preventing and controlling stunting is something that is really urgent right now. As a result of chronic malnutrition, stunting is not just stunting the growth of children with a height lower than the age standard, but stunting must be taken into account because stunting can have a negative impact on children's brain, cognitive and physical development. Therefore, preventing stunting is very important to ensure children's health and quality of life in the future. Several steps that can be taken to prevent stunting include: providing exclusive breastfeeding for the first six months, providing nutritious and balanced complementary foods after six months, maintaining environmental cleanliness and sanitation, and immunizing children regularly.<sup>(22,23)</sup>

The impact of stunting on the nation's future is enormous. Children who experience stunting will have a higher risk of experiencing learning disorders, low productivity, and are vulnerable to chronic diseases. Stunting can also reduce the quality of human resources and the nation's competitiveness in the era of globalization.

Therefore, preventing and controlling stunting must be a national priority to create a healthy, intelligent and prosperous generation.<sup>(18)</sup>

### CONCLUSION

Based on the research results, it can be concluded that increasing the capacity of health cadres can increase their knowledge and improve the expected food patterns of pregnant women in order to prevent stunting in the long term.

### REFERENCES

1. Kemenkes RI. Riset kesehatan dasar (Riskesdas) tahun 2018. Jakarta: Kemenkes RI; 2018.
2. Kemenkes RI. Buku saku hasil studi status gizi indonesia (SSGI) tahun 2022. Jakarta: Kemenkes RI; 2022.
3. Sekretariat Wakil Presiden RI. 100 kabupaten/kota prioritas untuk intervensi anak kerdil (stunting). Jakarta: Sekretariat Wakil Presiden RI; 2017.
4. BPS Kota Malang. Kota Malang dalam angka tahun 2022. Malang: BPS Kota Malang; 2022.
5. Pudjirahaju A, Anom Aswin AAG, Soelistyorini D. Modifikasi konseling menyusui modul 40 jam WHO/Unicef dalam manajemen laktasi terhadap peningkatan praktik ASI eksklusif di Kota Malang. Malang: Politeknik Kesehatan Kemenkes Malang; 2018.
6. Friska D, Kekalih A, Runtu F, Rahmawati A, Ibrahim NAA, Anugrapaksi E, Utami NPBS, Wijaya AD, Ayuningtyas R. Health cadres empowerment program through smartphone application-based educational videos to promote child growth and development. *Front Public Health*. 2022 Oct 13;10:887288.
7. Siswati T, Iskandar S, Pramestuti N, Raharjo J, Rialihanto MP, Rubaya AK, Wiratama BS. Effect of a short course on improving the cadres' knowledge in the context of reducing stunting through home visits in Yogyakarta, Indonesia. *Int J Environ Res Public Health*. 2022 Aug 10;19(16):9843.
8. Mousa M, Boyle J, Skouteris H, Mullins AK, Currie G, Riach K, Teede HJ. Advancing women in healthcare leadership: A systematic review and meta-synthesis of multi-sector evidence on organisational interventions. *EClinicalMedicine*. 2021 Aug 12;39:101084.
9. Kumar S, Bothra V, Mairembam DS. A dedicated public health cadre: urgent and critical to improve health in India. *Indian J Community Med*. 2016 Oct-Dec;41(4):253-255.
10. da Silva Lopes K, Takemoto Y, Garcia-Casal MN, Ota E. Nutrition-specific interventions for preventing and controlling anaemia throughout the life cycle: an overview of systematic reviews. *Cochrane Database Syst Rev*. 2018 Aug 10;2018(8):CD013092.
11. da Silva Lopes K, Yamaji N, Rahman MO, Suto M, Takemoto Y, Garcia-Casal MN, Ota E. Nutrition-specific interventions for preventing and controlling anaemia throughout the life cycle: an overview of systematic reviews. *Cochrane Database Syst Rev*. 2021 Sep 26;9(9):CD013092.
12. Petry N, Jallow B, Sawo Y, Darboe MK, Barrow S, Sarr A, Ceesay PO, Fofana MN, Prentice AM, Wegmüller R, Rohner F, Phall MC, Wirth JP. Micronutrient deficiencies, nutritional status and the determinants of anemia in children 0-59 months of age and non-pregnant women of reproductive age in the Gambia. *Nutrients*. 2019 Sep 23;11(10):2275.
13. Correa-de-Araujo R, Yoon SSS. Clinical outcomes in high-risk pregnancies due to advanced maternal age. *J Womens Health (Larchmt)*. 2021 Feb;30(2):160-167.
14. Muglia LJ, Benhalima K, Tong S, et al. Maternal factors during pregnancy influencing maternal, fetal, and childhood outcomes. *BMC Med*. 2022;20:418.
15. Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Bommarito K, Madden T, Olsen MA, Subramaniam H, Peipert JF, Bierut LJ. Maternal age and risk of labor and delivery complications. *Matern Child Health J*. 2015 Jun;19(6):1202-11.
16. Muhamad Z, Mahmudiono T, Abihail CT, Sahila N, Wangi MP, Suyanto B, Binti Abdullah NA. Preliminary study: the effectiveness of nutrition education intervention targeting short-statured pregnant women to prevent gestational stunting. *Nutrients*. 2023; 15(19):4305.
17. Ferrari N, Joisten C. Impact of physical activity on course and outcome of pregnancy from pre- to postnatal. *Eur J Clin Nutr*. 2021;75:1698-1709.
18. Beal T, Tumilowicz A, Sutrisna A, Izwardy D, Neufeld LM. A review of child stunting determinants in Indonesia. *Matern Child Nutr*. 2018 Oct;14(4):e12617. doi: 10.1111/mcn.12617. Epub 2018 May 17.
19. Young MF, Nguyen PH, Gonzalez Casanova I, Addo OY, Tran LM, Nguyen S, et al. Role of maternal preconception nutrition on offspring growth and risk of stunting across the first 1000 days in Vietnam: A prospective cohort study. *PLoS ONE*. 2018;13(8):e0203201.
20. Santosa A, Novanda Arif E, Abdul Ghoni D. Effect of maternal and child factors on stunting: partial least squares structural equation modeling. *Clin Exp Pediatr*. 2022 Feb;65(2):90-97.
21. De Sanctis V, Soliman A, Alaaraj N, Ahmed S, Alyafei F, Hamed N. Early and long-term consequences of nutritional stunting: from childhood to adulthood. *Acta Biomed*. 2021 Feb 16;92(1):e2021168.

22. Hadi H, Fatimatasari F, Irwanti W, Kusuma C, Alfiana RD, Asshiddiqi MIN, Nugroho S, Lewis EC, Gittelsohn J. Exclusive breastfeeding protects young children from stunting in a low-income population: a study from eastern Indonesia. *Nutrients*. 2021 Nov 26;13(12):4264.
23. Khatib MN, Gaidhane A, Upadhyay S, Telrandhe S, Saxena D, Simkhada PP, Sawleshwarkar S, Quazi SZ. Interventions for promoting and optimizing breastfeeding practices: An overview of systematic review. *Front Public Health*. 2023 Jan 24;11:984876.