Evaluation Of The Adequacy Level Of Nutritional Substances (Vitamins) With The Incident Of Stunting In Children In The Working Area Of The Surabaya City Health Center

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Abstract.

Stunting is a condition where height growth disorders arise due to malnutrition, so that a child's height does not correspond to his age. The aim of this research is to evaluate the use of vitamins and minerals in stunting cases in several Surabaya Community Health Centers. The results of this research are descriptive with prospective data collection. The number of respondents obtained was 64 stunting child patients who met the inclusion criteria. Based on the results of child demographics according to age, the most stunting child patients were 32 patients aged 48 – 60 months (50%). Based on gender, the results were balanced between women and men. Based on a history of exclusive breastfeeding, the majority had a history of exclusive breastfeeding, 52 patients (81.25%). Based on birth weight, the highest number of patients with a normal weight (>2500) grams was 53 patients (82.82%). Based on disease history, the majority did not have a history of disease, 53 patients (82.82%). The vitamins and minerals used in stunting cases in several Surabaya Community Health Centers are Optima Zinc Syrup, Vitamin and Mineral Powder, Taburia, and Vitamin A Capsules, with the rules and duration of use according to those given. Based on the results of nutritional status assessments at several Surabaya Community Health Centers, it was found that the majority of children were underweight based on Z-Score BW/U, had short status based on Z-Score BH/U, and had good nutritional status based on Z-Score BW/BH. The results of the nutritional status assessment concluded that the majority of children were underweight based on Z-Score BW/U, had short status based on Z-Score BH/U, and had good nutritional status based on Z-Score BW/BH.

Keywords: *Stunting, Zinc, Z-Score, Vitamine and Children.*

I. INTRODUCTION

Stunting is a problem because it is associated with an increased risk of morbidity, death, hampered motor development and also disruption of brain growth [1]. The World Health Organization (WHO), estimates that the prevalence of stunting worldwide is 22% or 149.2 million in 2022. Based on the 2021 Indonesian Nutrition Status Survey (SSGI), the national stunting rate has decreased by 1.6% per year from 27 .7% in 2019 to 24.4% in 2021 [2]. The Indonesian Toddler Nutrition Status Survey (SSGBI) estimates the prevalence of stunting in the city of Surabaya in 2019 at 16.87% [3].Stunting is a condition where height growth disorders arise due to malnutrition, so that a child's height does not match his age. Stunting is an anthropometric standard for assessing children's nutritional status, based on the index Body Weight according to Age (BW/U), Body Length according to Age (BH/U) or Body Height according to Age (BH/U) and Body Weight according to Length or Height (BW/BH) threshold (z-score) <-2 SD [4].The problem of stunting will have an impact on the quality of Human Resources (HR). Stunting causes the body's organs to not grow and develop optimally. Stunting has impacts in the short term and impacts in the long term. The impact of short-term stunting can result in children failing to grow, obstacles in cognitive and motor growth, sub-optimal physical body size and metabolic disorders in children [5]. Meanwhile, the impact of long-term stunting can cause a decrease in intellectual capacity, disruption of the structure and function of nerves and

brain cells, stunting can also cause problems with growth, and increase the risk of non-communicable diseases such as diabetes mellitus, hypertension, coronary heart disease and stroke [6].

Stunting prevention must be attempted from an early age. Such as providing Early Breast feeding Initiation (IMD) to babies, giving exclusive breast milk to babies up to 6 months of age, providing complementary breast milk food to babies over 6 months to 2 years. Apart from that, they can also provide complete basic immunization, as well as monitor the growth of toddlers at the nearest posyandu, and adopt clean and healthy living habits. It can also fulfill the body's nutritional needs to prevent stunting in toddlers. Apart from that, efforts to prevent stunting can also be carried out through education about stunting. In this case, outreach regarding stunting is carried out among the community, and providing education for companions during pregnancy, postpartum and breastfeeding. Efforts to prevent stunting in children can also be done by providing vitamins and minerals according to what the body needs [7].In the context of efforts to prevent stunting in children, the pharmaceutical sector also has an important role. The pharmaceutical profession also plays a role in efforts to optimize the prevention or treatment of stunting in children. In this case, the pharmaceutical profession plays an important role in providing supplementation, especially vitamins and minerals. The pharmaceutical profession plays a role in providing information and education for patients regarding the appropriate and correct use of medicines. The medicine referred to in this case is vitamin and mineral supplementation in order to meet the nutritional needs required by nutrition for the growth process (Deye, N et al., 2014).One of the government's efforts to prevent stunting is to improve the nutritional status of children through specific nutritional interventions including vitamin A and taburia supplementation [3].

Vitamin A is a vitamin that is important for vision, growth and supports the immune system. Children who experience vitamin A and zinc deficiencies will have a 1.57 and 2.67 times risk of experiencing stunting [9].Previous research showed that giving Taburia for 150 days with a final sample size of 471 samples experienced an increase in body weight and body length with average values of 0.45 kg and 1.43 cm. In the identification of this research, it was discovered that there was a significant increase in body weight and body length over 150 days (5 months) [10]. Apart from that, in several studies that have been carried out, it is known that giving zinc supplements to children under five who are stunting, after 16 weeks of giving zinc supplementation to stunting children aged 2-5 years, the results were that the children (100%) experienced an increase in BW/U, BH/U and BW/BH. This is because zinc (Zn) is closely related to bone metabolism, so it is very important in the growth and development stages of children. Zinc supplementation is effective for stunting children, especially during the golden age because the growth and development process can be optimized rapidly [11].Based on the background description above, this encourages researchers to conduct research on the use of vitamins and minerals in stunting cases. Researchers conducted research at several Community Health Centers in Surabaya, because there are still quite a lot of cases of children experiencing stunting and it becomes a serious problem if prevention is not carried out. Therefore, researchers are interested in studying studies on the use of vitamins and minerals given to stunting children at the Surabaya Community Health Center, as an effort to prevent or overcome cases of stunting.

II. METHODS

This type of research is observational research. Observational research is research carried out without intervening with research subjects which is directed at explaining a condition or situation. The research design used was prospective data collection. Data sources were obtained from the Kebonsari, Gayungan, Wonokusumo, Wonokromo and Sidosermo Community Health Centers.Population in this study were child patients diagnosed with stunting at Community Health Centers in Surabaya. The sample in this study was all pediatric patients diagnosed with stunting who met the inclusion criteria. The sample size in this study was 64 child patients diagnosed with stunting. The sampling method used is using a non-random sampling technique where the sample is selected according to the researcher's wishes. The samples taken in this study were samples that met the inclusion criteria and were not included in the exclusion criteria.

Operational Definition of Variables :

1. Measurement of child characteristics
   Measurements of child characteristics include age, gender, birth weight, history of exclusive breastfeeding, and history of illness. This measurement is used to see the profile or identity of pediatric patients which is associated with the use of vitamins and minerals in children.
2. Use of Vitamins and Minerals
   In the profile of vitamin and mineral use, what is observed is the name of the drug, dose of the drug, rules for using the drug, and duration of drug use in stunting patients.
3. Assessment of Nutritional Status
   Assessment of nutritional status in children includes the BW/U, TB/U, and BW/TB index to see the child's nutritional status before and after the use of vitamins and minerals.

The research instrument used is

1. Stunting recapitulation report for stunting patients in Surabaya City containing name, age, gender, weight, height, and type of vitamin and mineral therapy given.
2. LPD (Data Collection Sheet)
3. Respondent Interview Sheet.

Data analysis :

The data used in this research was obtained and then recapitulated, processed and analyzed descriptively.

Research Ethics :

Before conducting the research, the author carried out an ethical test at the Ethical Committee Medical Research, Muhammadiyah Lamongan University with No. 327 /EC /KEPK – S1 / 07 / 2023.

III. RESULT AND DISCUSSION

The results of this research are descriptive with prospective data collection. The respondents obtained were 64 stunting child patients who met the inclusion criteria with patient demographic data as follows;

Table 1. Demographics of patients with stunting children

Demographics	Totale (patient)	Percentage (%)
Age (months)		
24 - 35	16	25,00
36 - 47	16	25,00
48 - 60	32	50,00
Totale	64	100,00
Gender		
Male	32	50,00
Female	32	50,00
Totale	64	100,00
Breast milk history		
Exclusive breastfeeding	52	81,25
Non exclusive breastfeeding	12	18,75
Totale	64	100,00
Birth weight		
Low (<2500)	11	17,18
Normal (>2500)	53	82,82
Totale	64	100,00
History of illness		
Not	53	82,82
TBC	3	4,69
cow's milk allergy	1	1,56
stomach infection	1	1,56
Hypothyroid	3	4,69
acute respiratory infections	1	1,56

Cerebral Palsy	1	1,56
Lung Infection	1	1,56
Totale	64	100,00

Global Nutrition Report: Action onequity to end Malnutrition. Stunting is strongly associated withiron and zinc deficiency, which are still prevalent in low-incomecountries. The respondents obtained were 64 stunting child patients who met the inclusion criteria with patient demographic. Based on Table 1. Demographics of Stunting Child Patients, it is known that the majority of stunting child patients are in the age range of 48-60 months with 32 patients (50%). Age influences stunting because children aged > 24 months do not understand hygiene and in their environment do not implement healthy living behavior [12](12). Apart from that, at this time the child will begin to enter the weaning phase and the child has become an active consumer so that appetite, nutritional intake becomes careless and food hygiene becomes less frequent [12]. Lack of cleanliness can cause toddlers to get sick easily, if toddlers are sick then there can be a decrease in appetite and this can result in a lack of nutrition entering the body, thus causing the toddler's growth to be disrupted resulting in stunting [6].The gender demographics of stunting child patients are known to be equally male and female. Gender has no effect on stunting, where no definite reason has been found for the relationship between gender and stunting (Deye, N et al., 2014).

However, several studies show that the risk of experiencing stunting is higher in boys than girls under 1 year of age, but after over 1 year of age, girls have a higher risk.This is because the nutritional needs of boys and girls are different. These nutritional needs are influenced by the body composition of boys and girls. Boys have greater muscle mass while girls have greater fat mass. The ratio of body fat mass is between 25-30% in women and 18-23% in men. If the large fat mass is not balanced with adequate intake, malnutrition and failure to grow will result [5] Demographics of breastfeeding history, it was found that the majority of stunting child patients had a history of exclusive breastfeeding, 52 patients (81.25%). Based on several research results, it can be seen that exclusive breastfeeding for 6 months can have an effect on the incidence of stunting. Exclusive breastfeeding can reduce the risk of babies being malnourished, because breast milk is a natural food provided for babies with a nutritional composition that is suitable for the baby's development [13]. However, research results showed that most stunting child patients had a history of exclusive breastfeeding, this is because stunting can be caused by multi-dimensional factors other than exclusive breastfeeding, such as socio-economic factors, sanitation and access to drinking water. Apart from that, giving MP-ASI also affects stunting. Giving MP-ASI too early or too late, MP-ASI whose nutrition does not match the baby's needs or the pattern of giving it is not good according to age, and inadequate baby care causes growth disorders in the early period of the baby's life [14].

Birth weight demographics, it was found that 53 patients (82.82%) had normal birth weight. Normal birth factors can also influence the incidence of stunting, which is caused by parents not being good at providing care after birth. Apart from that, it can also be influenced by inadequate nutritional intake, especially during 1000 HPK because good care and nutritional intake can cause babies to have optimal growth and development [5].The most common demographics of disease history among stunting child patients were 53 patients (82.82%). A history of disease influences stunting, but research results show that pediatric patients who do not have a history of disease are also at risk of stunting. This is due to several other factors such as low nutritional intake and interrelated family economic factors. Nutritional intake factors are related to infectious diseases because children who suffer from infectious diseases will have appetite disorders and this will subsequently lead to malnutrition. Apart from that, children with infectious diseases will not feel hungry and will not want to eat, so the body will use up nutritional intake that should be used for growth [15], [16]Family socio-economic status such as family income, parental education, mother's knowledge about nutrition, and number of family members can indirectly be related to the incidence of stunting. The following are the demographics of the patient's family.

Table 2. Demographic Family Characteristics

Demographics	Totale (patient's family)	Percentage (%)
Education		
Elementary School	7	10,94
Junior High School	11	17,18

Senior High School	39	60,94
Diploma	1	1,56
Bachelor	6	9,38
Totale	64	100,00
Occupations		
Employees	36	56,25
Teacher	1	1,56
government employees	2	3,13
businessman	11	17,18
Driver	15	23,43
Totale	64	100,00
Income (IDR)		
0-500.000	1	1,56
600.000 - 1.000.000	10	15,63
1.100.000 - 2.000.000	23	35,94
> 2.000.000	30	46,87
Totale	64	100,00

Demographics of families of patients with stunting children in table 2, based on education it is known that the majority were high school/equivalent as many as 39 respondents (60.94%). The level of education, especially the mother, influences the child's health status because the mother's role is more in providing nutrition and food variants to the child (24). If the educational level of the father and mother is higher, the child's risk of stunting will decrease by 3-5%. However, even though the mother's parenting style is good, in families with low income there are limitations in meeting daily needs so that the mother's parenting pattern is not related to the occurrence of stunting problems. Socioeconomics is related to the family's ability to buy food, the quality of food managed every day both in terms of quality and number and number of family members.

This is because having more than four family members can influence the incidence of stunting if the family economy is classified as less capable of meeting the food and nutritional needs of the family [4].Occopation demographics are also consistent with income, it was found that the majority of respondents had jobs as private employees, 36 respondents (65.25%) with the highest income > 2,000,000, 30 respondents (46.87%). Employment and income are related factors, where low income tends to experience stunting because low economic status causes low purchasing power. Thus, the problem of children's nutritional status is more vulnerable because adequate and adequate nutritional needs are not met [4].Regarding the use of vitamins and minerals in patients with stunting children, it is known that patients with stunting children receive different interventions at several community health centers such as Optima zinc syrup, vitamin and mineral powder, taburia and vitamin A capsules. The provision of these vitamins and minerals has been appropriately adjusted to their conditions and needs stunting child patients

Table 3. Demographic profile of vitamin and mineral use in patients with stunting children

Generic names of vitamins and minerals	Dose		Frequency medication	Duration of drug use (months)	Totale (Patient)	%
Sirup Zinc Optima (8 mg zink + 25 mg/5 ml vitamin C)	8 mg Zink + 25 mg Vitamin C		1 time every day	3	30	46,87
vitamin and mineral powder	Vitamin C	25 mg	2 time every day	4	14	21,88
	B complex vitamins	Vit B1 2 mg, Vit B2 2 mg, Vit B6 2 mg, Calcium Pantothenate 10 mg dan Nicotinamide 20 mg				
	Calsium Laktat Tablet	500 mg				
Taburia	- Vit A 417 mcg - Vit B1 0,5 mg - Vit B2 0,5 m - Vit B3 5 mg - Vit B6 0,5 mg - Vit B12 1 mcg - Asam Folat 150 mcg		2 time every day	4	4	6,25

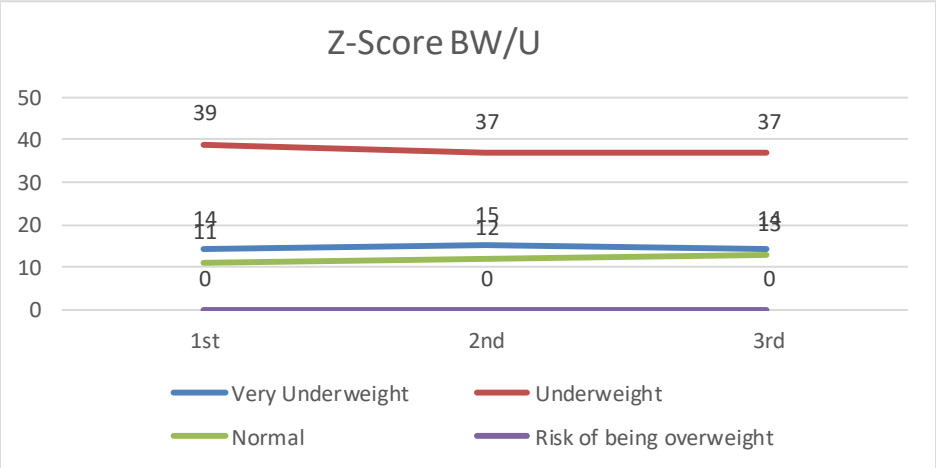
	- Vit C 20 mg - Asam Pantotenat 3 mg - Vit D3 5 mcg - Vit E 6 mg - Vit K1 20 mcg - Iodium 50 mcg - Zat Besi (Fe) 10 mg - Seng (Zn) 5 mg - Selenium 20 mcg - Maltodextrin ad 1000 mg					
vitamin A capsules	200.000 IU		1 time every day	6		
vitamin and mineral powder	B complex vitamins	½ Tablet (75 mg)	1 time every day	6	16	25,00
	Zink Tablet	1 Tablet (10 mg)				
	Calsium Laktat Tablet	½ Tablet (250 mg)				

Based on table 3, Optima zinc syrup containing 8 mg zinc and 25 mg vitamin C per 5 ml is given with instructions for use, drink it once a day, with a dose of 8 mg zinc and 25 mg vitamin C. Zinc can optimize food absorption and improve the child's growth and development process. Meanwhile, Vitamin C acts as an antioxidant needed by the body to help increase iron absorption and the immune system. The combination of Zinc and Vitamin C in Optima zinc syrup is very appropriate, the benefits of Optima zinc syrup can meet the zinc and vitamin C needs that children need. maintains and increases the body's immunity, helps the growth and development of babies and children, and can protect the body from free radicals [17].Providing vitamin and mineral powder with a combination composition of vitamin C, vitamin B complex and calcium latate at a daily dose of one packet. Apart from that, there is also a vitamin and mineral powder containing a combination of zinc, vitamin B complex and calcium lactate with a daily dose of one packet. The composition of the vitamin and mineral powder is adjusted according to the patient's condition and needs.

Vitamin B Complex can increase the body's metabolic reaction rate, stimulate the hypothalamus to increase appetite and support growth. Low zinc consumption in toddlers can have an effect on low growth hormone, ultimately inhibiting toddler growth. Apart from growth, zinc also plays a role in regeneration and improving the function of intestinal villi in patients with acute diarrhea, thereby improving food absorption. Calcium lactate is a mineral that is important in the process of bone growth so low bone mineralization can affect bone growth, causing rickets in childhood and if the deficiency is severe it can cause stunting [15].Giving taburia, which is a multivitamin and mineral given for micronutrient needs and increases the child's immune system and appetite, so that it can help the child's growth and development (34). Taburia is given in 1 sachet (1 g) once every two days in children's food, with the method of use it should not be mixed with drinks and soupy foods and should not be mixed when the food is warm [14].Vitamin A is given at a dose of 200,000 IU (red capsules) which is given every 6 months or 2 times a year in February and August with each child receiving 1 capsule (36). Vitamin A is a nutrient that is very necessary for the body in physiological processes in the body including cell growth, improving vision function, improving immunity and body growth [18].

Table 4. Assessment of Nutritional Status Based on Z-Score BW/U

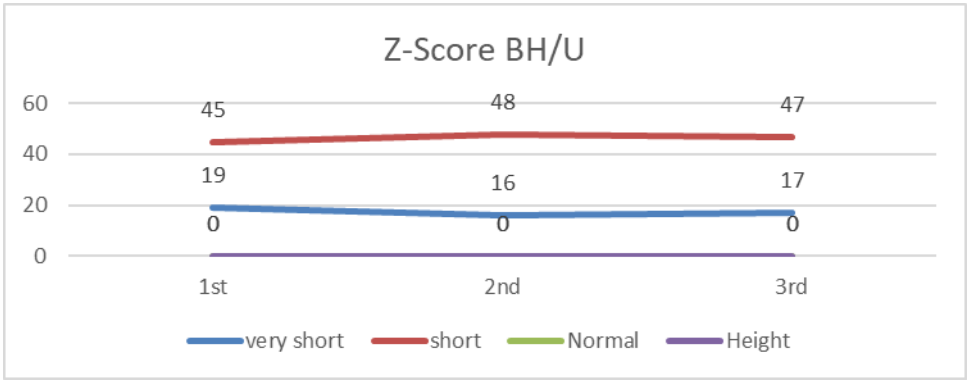
Indeks	Classification	1st month		2nd month		3rd month	
		n	%	n	%	n	%
Z-Score BW/U	Very Underweight	14	21.88	15	23.44	14	21.88
	Underweight	39	60.94	37	57.81	37	57.81
	Normal	11	17.18	12	18.75	13	20.31
	Risk of being overweight	0	0.00	0	0.00	0	0.00



Assessment of Nutritional Status Based (table 4) on Z-Score BW/U for three months, it is known that in the very low weight classification there were 14 pediatric patients (21.88%) in the 1st month and 3rd month. In the underweight classification, there was a decrease in the number of pediatric patients from 39 pediatric patients (60.94%) in the 1st month to 37 pediatric patients (57.81%) in the 3rd month. In the normal weight classification, there was an increase in the number of pediatric patients from 11 pediatric patients (17.18%) in the 1st month to 13 pediatric patients (20.31%) in the 3rd month. Based on the research results, it shows that the majority of the research samples are still classified as underweight on the BW/U index or have underweight or even very underweight. A low BW/U index can be caused by being short (chronic nutritional problems) or suffering from an infectious disease (acute nutritional problems). In addition, the unstable characteristics of body weight mean that the BW/U index can only assess current nutritional status [19].

Table 5. Assessment of Nutritional Status Based on Z-Score BH/U

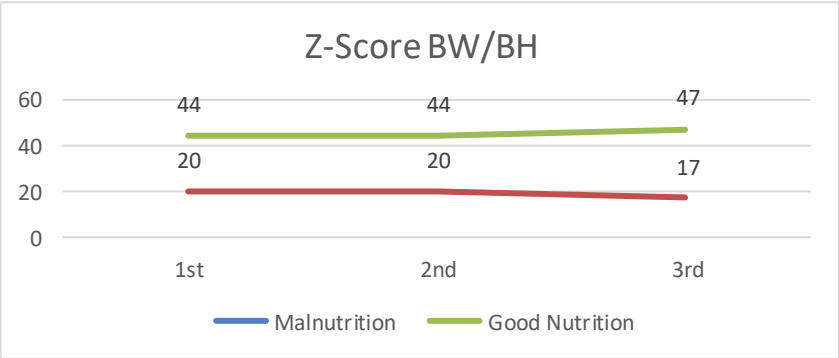
Indeks	Classification	1st month		2nd month		3rd month	
		n	%	n	%	n	n
Z-Score BH/U	very short	19	29.69	16	25.00	17	26.56
	short	45	70.31	48	75.00	47	73.44
	Normal	0	0.00	0	0.00	0	0.00
	Height	0	0.00	0	0.00	0	0.00



In Table 5. Assessment of Nutritional Status Based on Z-Score BH/U for three months, it is known that in the very short classification there was a decrease in the number of child patients from 19 child patients (29.69%) in the 1st month to 17 child patients (26.56 %) in the 3rd month. In the short classification, there was an increase in the number of pediatric patients from 45 pediatric patients (70.31%) in the 1st month to 47 pediatric patients (73.44%) in the 3rd month. Based on the research results, it shows that the majority of the samples are still classified as stunting on the BH/U index or have short height.

Table 6. Assessment of Nutritional Status Based on Z-Score BW/BH

Indeks	Classification	1st month		2nd month		3rd month	
		n	%	n	%	n	n
Z-Score BW/BH	Malnutriton	20	29,69	20	29,69	17	25,00
	good nutrition	44	68,75	44	68,75	47	73,44



In Table 6. Assessment of nutritional status based on Z-Score BW/BH for three months, it is known that in the classification of malnutrition there was 1 child patient (1.56%) from the 1st month to the 3rd month. In the malnutrition classification, there was a decrease in the number of child patients from 19 child patients (29.69%) in the 1st month to 16 child patients (25.00%) in the 3rd month. In the good nutrition classification, there was an increase in the number of child patients from 44 child patients (68.75%) in the 1st month to 47 child patients (73.44%) in the 3rd month. Based on the research results, it shows that the majority of the research samples had good nutritional status based on the BW/BH index. However, wasting was also experienced by some of the research samples. Malnutrition status (wasting) is a condition where a child looks thin, very thin or even obese. The BW/BH index provides an indication of acute nutritional problems that occur in short-lived events such as disease ouBHreaks and food shortages which will cause a person to appear thin. Undernutrition in children can be caused by infectious diseases [19].From these final results, there are still stunting child patients who still have stunting status. This is due to a lack of adequate nutritional needs for children, and a lack of knowledge about nutrition and stunting among parents. Some of these things might affect the condition of children who are still stunting. Providing vitamins and minerals as micronutrient intake is not sufficient in efforts to handle stunting cases, it is necessary to provide a balanced intake of macronutrients such as carbohydrates, fats and proteins by looking at the type, frequency and amount of food in the child's diet.

IV. CONCLUSION

Zinc syrup, vitamin and mineral powder, taburia, and vitamin A capsules are the vitamins and minerals used in patients with stunting. The guidelines and timing of administration are based on the age-specific demographics of the child population. The majority of patients with stunted children are between the ages of 48 and 60 months, both male and female, with a history of exclusively breastfeeding and a normal birth weight (>2500 grams) without a medical history. Based on Z-Score BB/U, Z-Score TB/U, and Z-Score BB/TB, the nutritional status assessment results typically indicate that most children are underweight, have short status, and have good nutritional status.

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REFERENCES

[1] Kementerian Pelaksana Program/Kegiatan PencegahanAnak Kerdil (Stunting), *Strategi Nasional Percepatan Pencegahan Anak Kerdil (Stunting)*. 2018.

[2] D. A. Ilmani and S. Fikawati, "Nutrition Intake as a Risk Factor of Stunting in Children Aged 25 – 30 Months in Central Jakarta , Indonesia," ***J. Gizi Pangan,*** vol. 18, no. 28, pp. 117–126, 2023, doi: https://doi.org/10.25182/jgp.2023.18.2.117-126.

[3] S. E. Wahyuningsih, A. Margawati, M. S. E. Mexitalia, E. R. Noer, and A. Syauqy, "Effectiveness of Zinc Suplementation on Linear Growth of Stunting Toddlers in Semarang City," ***J. Aisyah J. Ilmu Kesehat.***, vol. 7, no. 4, pp. 1273–1280, 2022, doi: 10.30604/jika.v7i4.1482.

[4] K. P. dan P. N. B. P. dan P. Nasional, Pedoman Pelaksanaan Intervensi Penurunan Stunting Terintegrasi Di Kabupaten/Kota, no. November. 2018.

[5] M. Y. E. S. and S. S. Fitrah Ernawati , Ahmad Syauqy, Aya Yuriestia Arifin, "Micronutrient Deficiencies and Stunting Were Associated with Socioeconomic Status in Indonesian Children Aged," *Nutrients*, vol. 13, no. 1802, pp. 1–9, 2021.

[6] Direktorat Jenderal Kesehatan Masyarakat Kementerian Kesehatan, *Pedoman strategi komunikasi "Perubahan Perilaku Dalam Percepatan Pencegahan Stunting Di Indonesia*. 2018.

[7] A. Alifariani, B. Murti, and R. B. Adriani, "Meta Analysis : Effects of Prelacteal Feeding and Vitamin A Supplementary Intake on Stunting in Children Aged 6-59 Months," ***J. Matern. Child Heal.*** *(2023)*, vol. 08, no. 04, pp. 498–509, 2023.407–416.

[8] Deye, N 13). Impact of environment on mosquito response to pyrethroid insecticides: facts, evidences and prospects. Insect Biochemistry and Molecular Biology, 43(4) *et al.*, "Factors influencing compliance to prevention of motherto-child transmission guidelines in Western Kenya," *Ann. Glob. Heal.*, 2014.

[9] R. Putri, R. Nuzuliana, and H. F. Kurniawati, "Management Of Stunting To Improved Children," in *1st International Respati Health Conference (IRHC)*, 2019, pp. 490–500.

[10] K. Sambutan, M. Desa, and P. D. Tertinggal, *Buku Saku Desa dalam Penanganan Stunting*. 2017.

[11] A. Dwi *et al.*, "Risk Factors and Nutritional Profiles Associated with Stunting in Children," *Pediatr Gastroenterol Hepatol Nutr*, vol. 23, no. 5, pp. 457–463, 2020, doi: https://doi.org/10.5223/pghn.2020.23.5.457.

[12] A. Dwi, N. Yadika, K. N. Berawi, and S. H. Nasution, "Pengaruh Stunting terhadap Perkembangan Kognitif dan Prestasi Belajar," no. September, pp. 273–282, 2019.

[13] R. Rukmini, E. Fatmawati, Y. Trisnanto, and Y. Fitrianti, "Strategi Intervensi Program dan Pemanfaatan Potensi Lokal dalam Upaya Peningkatan Cakupan ASI Eksklusif di Kabupaten Balangan," *Media Penelit. dan Pengemb. Kesehat.*, vol. 30, no. 3, pp. 211–224, Oct. 2020, doi: 10.22435/mpk.v30i3.2743.

[14] Badan Penelitian dan Pengembangan Kesehatan, Pendek (Stunting)Di Indonesia, Masalah Dan Solusinya. 2015.

[15] Y. Handayani and M. R. Makful, "Effect of nutrition improvement program implementation on stunting in children under two years old," *Ber. Kedokt. Masy.*, vol. 35, no. 1, pp. 23–28, 2019.

[16] S. Septi Fandinata and I. Ernawati, "Management terapi pada penyakit degeneratif," *Mengenal, mencegah, dan mengatasi penyakit Degener. (diabetes melitus dan Hipertens.*, pp. 1–134, 2020, [Online]. Available: http://repository.akfarsurabaya.ac.id/393/

[17] P. W. Purnasari, "Suplementasi Probiotik dan Zinc untuk Malnutrisi," ***JOHC***, vol. 1, no. 2, 2020.

[18] P. S. Id *et al.*, "Association of vitamin A deficiency with early childhood stunting in Uganda : A population-based cross-sectional study," *PLoS One*, pp. 1–16, 2020, doi: 10.1371/journal.pone.0233615.

[19] E. Nurhayati, B. A. Paramashanti, D. Astiti, and A. S. Aji, "Dietary diversity , vitamin D intake and childhood stunting : a case-control study in Bantul , Indonesia," ***Mal J Nutr,*** vol. 26, no. 2, pp. 273–287, 2020, doi: https://doi.org/10.31246/mjn-2020-0021.