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THE IMPACT OF HONEY ON CHANGE IN NUTRITIONAL STATUS IN CHILDREN WITH POOR NUTRITION

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ABSTRACT

Background: Toddlers are vulnerable groups to malnutrition. Thus, to maintain their nutritional status is needed. Honey is considered having health benefits that might increase the nutritional status in children. However, little is known about the impact of honey on nutritional change in Sumbawa.

Objectives: The aim of this study is to analyze the effect of honey on changes in nutritional status in children with poor nutrition in the area of the Health Center of Lopok, Sumbawa Indonesia

Methods: This study employed a quasi experiment design with pretest-posttest with control group. The total sample in this study were 60 children recruited by simple random sampling, divided into 2 groups, namely 30 children in intervention group and 30 children in control group. The sampling technique used simple random sampling. Data were analyzed using Mann Whitney and linear regression test.

Results: Findings showed that there were significant mean differences between the intervention and control group in term of weight (intervention 1.316; control 0.903), height (intervention 1.586; control 1.030), weight-for-height (W/H) z-score (intervention 0.713; control 0.595), weight-for-age (W/A) z-score (intervention 0.717; control 0.531), and height-for-age (H/A) z-score (intervention 0.847; control 0.423) with p-value < 0.05.

Conclusion: There was a significant effect of honey on changes in nutritional status in children with poor nutrition. It is suggested that health providers may use honey to deal with children under nutrition to increase their appetite and change their nutritional status.

Key words: honey, nutritional status, toddler

INTRODUCTION

Toddlers are vulnerable groups to malnutrition in the community.[1] Malnutrition in children under five is not solely caused by lack of food, but also caused by some other factors such as inadequate complementary feeding or poor diet and lack of knowledge of mothers on how to maintain nutrition.[2] However, malnutrition does not occur

suddenly, but starting with the low weight gain. The toddler's body weight is an indication of the beginning of change in nutritional status of children.[3] In a period of 6 months, babies whose weight does not go up in two times are at risk of suffering from undernourishment 12.6 times compared to infants who gained weight steadily. When the frequency of body weight does not go up more often, then the risk will be increased.[3]

According to World health Organization (WHO), public health problem is considered high if the prevalence of malnutrition in children under five is between 20.0 to 29.0%, and considered as a very high prevalence when it is ≥ 30%.[4] Of the 33 provinces in Indonesia, the Province of West Nusa Tenggara (NTB) was ranked 9th highest experiencing a serious public health problem. The prevalence of malnutrition in children under five in this province was 25.6%.[5] For instance, Sumbawa was ranked 5th out of 10 districts/municipalities in the province of West Nusa Tenggara (NTB) in cases of malnutrition. Based on Nutritional Status Monitoring (PSG) in 2012, the cases of malnutrition in Sumbawa were 12.34%, and increased to 14.70% in 2014.[5]

The result of Nutritional Status Monitoring (PSG) in 2014 in Sumbawa showed that there were five health centers (Puskesmas) with the highest cases of malnutrition in children under five. [5] One of the health centers was in Puskesmas of Lopok in Sumbawa. There were 314 children under five in the area of this puskesmas, and the prevalence of undernourished children based on weight/height was 153 children (48.7%), and malnutrition was 18 children (5.73%).[5] Meanwhile, in 2015, of 326 toddlers, it showed that the prevalence of undernourished children based on weight-for-height (W/H) indicator was 181 children (55.5%), and malnutrition was 13 children (3.99%). Based on the preliminary study of 114 children in September 2015 - February 2016, it was 60 children (52.6%) were undernourished based on weight/height, and 7 children (6.14%) were malnutrition. [5] While the result of the interviews with parents/caregivers about children diet indicated that 60 children had poor diet pattern.

Nutritional status is a complex concept that is difficult to define.[6] Adequate nutritional status can perhaps be best defined as maintenance of a normal pattern of growth and a normal body composition by consumption of appropriate amounts and types of food.[6] Toddler with state of malnutrition refers to the unhealthy (pathological) condition caused by eating less and less energy consumption over a certain period. Weight loss is a major sign of malnutrition.[2] In this study, an undernutrition child was diagnozed after 3 times measurement in the Integrated Community Health Service (Posyandu) and had no weight improvement.[5] Under nutrition is directly caused by imbalanced consumption of food,[7] thus affecting the immune system that might be easily to be contracted by infectious diseases, such as diarrhea, fever, etc. In addition, less consumption on nutrients in children aged 24-59 months will impact to their growth and development. Therefore, intake of nutrients should contain energy, protein, carbohydrates, vitamins, iron, minerals, and folic acid.[8] All those nutrients however can be obtained from honey.[8]

Sugar in honey can be absorbed directly by the blood without digestion. Honey may help the body to maintain health and can stimulate appetite, and add the weight gain.[9] Honey has been known as a medicine and health drinks to supply energy to the body. Children who drink honey looks more energetic, lively, and are rarely infected with the disease.

Additionally, study also showed that there was an effect of honey on nutritional status and the appetite of children.[10,11] Therefore, this study aimed to examine the effect of honey on change in nutritional status in the area of the Health Center of Lopok Sumbawa.

METHODS

Design

This study employed a quasi experimental design with pretest-posttest design with control group.

Setting

The study was conducted in the Health Center (Puskesmas) of Lopok Sumbawa on 8 September 2016 - 8 November 2016.

Research Subjects

The total sample in this study was 60 respondents divided into two groups (30 subjects in Intervention group and 30 subjects in control group). Samples were recruited by simple random sampling. Criteria for inclusion in this study were: 1) Toddlers aged 24-59 months, 2) Malnutrition based on Z-score: -3 SD up to <-2 SD with indicator weight-for-height (W/H), 3) parents gave consent to their children as respondents and signed informed consent, and 4) The research subjects were in the area of Puskesmas of Lopok.

Instruments

The instrumens used in this study were: (1) demographic questionnaire, (2) digital scale to measure infants' weight with a precision of 0.1 kg, (3) Microtoise to measure the height of toddlers up to 24 months as measured by standing with a precision of 0.1 cm, (4) observation sheet adopted from Riskesdas 2013[12] as a tool on monitoring system of component of the nutritional status, (5) observation sheet of nutrient intake using the 24-hour dietary recall method (24hDR), a structured interview intended to capture detailed information about all foods and beverages consumed by the respondent in the past 24 hours, most commonly, from midnight to midnight the previous day. But this study used food recall 2x24 hours. The observation sheet has been validated by previous studies as an Indonesian version,[13,14] and (6) observation sheet adopted from WHO Anthro 2005[15] to measure the nutritional status.

Intervention

In this study, there were 2 groups: intervention and control group. The intervention group ws given honey as much as 45 gr per day for 2 months with drinking dose 3x1 (morning 15 gr, afternoon 15 gr and night 15 gr). Sumbawa honey was used in this study that has been tested in clinical laboratory tests to determine the authenticity of honey with pH honey results 3.59. There was no specific hours in consuming honey, only limited to the time of drinking in the morning, afternoon and evening; while the control group was given formula milk as much as 8 boxes of milk (60 cc per day 3x1 doses) in 2 months per infant. There was no specific time of consuming formula milk as the same time as the intervention group.

Ethical consideration

This research has passed the feasibility test of research ethics that have been published on 7 September 2016 by the Commission on Health Research Ethics (K.E.P.K) of the Health Ministry Polytechnic Semarang. Informed consent has been performed to the respondents, and the researchers explained the purpose of the study, which participation in this study was voluntary without coercion, procedures and duration of the study, the benefits of the research, the confidentiality of all the data, clarification if we need additional information about

this study, and willingness to participate in the study by signing a written informed consent.

Data analysis

Data analysis of the nutritional status of children before and after administration of honey used Mann Whitney and linear regression test. Data were not in normal distribution.

RESULTS

Majority of the respondents in this study as shown in the table 1 that most of the mothers had body's height <150 cm (96.67%), junior high school (Intervention 43.3%; Control 30%) and senior high school (Intervention 56.67%; Control 70%) as their background, and some of them working as entrepreneur (Intervention 43.3%; Control 33.33%) and not working (Intervention 30%; Control 40%); while the majority of the fathers in this study had junior high school (Intervention 56.67%; Control 33.33%) and senior high school background (Intervention 43.33%; Control 66.67%), and working as farmer (36.67%) and in private sectors (Intervention 43.33%; Control 36.67%). There were no differences between the intervention and control group in terms of mothers' height, education, and job with p-value > 0.05. However, there was a difference between both groups in terms of mother age with p-value < 0.05, which indicated that the age of the mothers in this study was not homogeneous.

Table 1. Characteristics of the Respondents

Variable	Group		*p-value* (Homogeneity)
	Intervention	Control	
Mother's age (Year)			
< 25 year	1 (3.33%)	12 (40%)	0.001
> 25 year	29 (96.67%)	18 (60%)	
Height of Mother (cm)			
< 150 cm	28 (93.33%)	28 (93.33%)	1.000
> 150 cm	2 (6.67%)	2 (6.67%)	
Education ∑ (%)			
Mother			
Junior High School	13 (43.33%)	9 (30%)	
Senior High School (SMA)	17 (56.67%)	21 (70%)	0.284
Father			
Junior High School	17 (56.67%)	10 (33.33%)	0.069
Senior High School (SMA)	13 (43.33%)	20 (66.67%)	
University	-	-	
Job ∑ (%)			
Mother			
Civil Servant	0 (0%)	1 (3.33%)	0.651
Private	3 (10%)	4 (13.33%)	
Farmer	5 (16.7%)	3 (10%)	
Entrepreneur	13 (43.3%)	10 (33.33%)	
Not working	9 (30%)	12 (40%)	
Father			
Civil Servant	1 (3.33%)	2 (6.67%)	0.899
Private	13 (43.33%)	11 (36.67%)	
Farmer	11 (36.67%)	11 (36.67%)	
Entrepreneur	5 (16.67%)	6 (20%)	

Table 2. Nutrient Intake and infectious disease in Infants

Variable	Group		*p-value* (Homogeneity)
	Intervention	Control	
Infant's gender			
Male	6 (20%)	17 (56.67%)	0.003
Female	24 (80%)	13 (43.33%)	
Infant's age			
Pre : < 40 months	11 (36.67%)	16 (53.33%)	0.194
> 40 months	19 (63.33%)	14 (46.67%)	
Post : < 40 months	9 (30%)	15 (50%)	0.114
> 40 months	21 (70%)	15 (50%)	
Nutrition Intake			
Energy intake (pre)			
< 80% of sufficiency	30 (100%)	25 (83.33%)	0.020
> 80% of sufficiency	0 (0%)	5 (16.67%)	
Energy intake (post)			
< 80% of sufficiency	20 (66.67%)	25 (83.33%)	0.136
> 80% of sufficiency	10 (33.33%)	5 (16.67%)	
Protein intake (pre)			
< 80% of sufficiency	28 (93.33%)	28 (93.33%)	1.000
> 80% of sufficiency	2 (6.67%)	2 (6.67%)	
Protein intake (post)			
< 80% of sufficiency	12 (40%)	26 (56.67%)	0.000
> 80% of sufficiency	18 (60%)	4 (43.33%)	
Infectious disease ∑ (%)			
Upper respiratory tract infection			
Yes	17 (56.67%)	17 (56.67%)	1.000
No	13(43.33%)	13 (43.33%)	
Diarrhea			
Yes	17 (56.67%)	17 (56.67%)	1.000
No	13 (43.33%)	13 (43.33%)	

Table 2 showed that there was a difference of infant's age between the intervention and control group with p-value 0.003, which indicated that the age between both groups was not homogen; while for infant's age there was no difference between the two groups in both pre and post with p-value 0.194. Those who aged > 40 months in the intervention group was 70% and in the control group was 50%.

For nutrient intake, there were no differences of the intervention and control group in term of energy intake (pre & post) with p-value 0.020 & 0.136; and protein intake (pre) with p-value 1.000. The energy intake (pre) of >80% of sufficiency in the intervention group was 0%, and in the control group was 16.67%; while the energy intake (post) of >80% of sufficiency in the intervention group was 33.3%, and in the control group was 16.67%. There was an increase of energy intake pre and post. However, there was a difference between the two groups in term os protein intake with p-value 0.000.

For infectious disease, there were no differences of the intervention and control group in terms of upper respiratory tract infection (56.67%) and dhiarrea (56.67%) with p-value 1.000.

Table 3. The Mean Difference of Children's weight, height, z-scores of W/H, W/A, H/A before and after intervention in the intervention and control group

No	Variable	Group		P value
		Intervention	Control	
1.	**Weight**			
	Before			
	Mean ± SD	10.89 ±1.049	10.50 ±1.065	0.162
	After			
	Mean ± SD	12.20 ±1.039	11.407 ±1.052	0.004
	Difference			
	Mean ± SD	1.316 ±0.087	0.903 ±0.135	0.000
2.	**Height**			
	Before			
	Mean ± SD	91.84 ±1.931	89.58 ±5.211	0.090
	After			
	Mean ± SD	93.42 ±4.848	90.61 ±5.314	0.036
	Difference			
	Mean ± SD	1.586 ±0.387	1.030 ±0.612	0.000
3.	**Weight-for-Height (W/H) (z-score)**			
	Before	-2.643 ±0.145	-2.610 ±0.165	0.411
	Mean ± SD			
	After	-1.930 ±0.152	-2.014 ±0.172	0.049
	Mean ± SD			
	Difference	0.713 ±0.046	0.595 ±0.080	0.000
	Mean ± SD			
4.	**Weight-for-Age (W/A) (z-score)**			
	Before			
	Mean ± SD	-2.533 ± 0.145	-2.521 ±0.215	0.801
	After			
	Mean ± SD	-1.816 ±0.122	-1.988 ±0.211	0.000
	Difference			
	Mean ± SD	0.717 ±0.069	0.531 ±0.126	0.000
5.	**Height-for-Age (H/A) (z-score)**			
	Before			
	Mean ± SD	-2.793 ±0.145	-2.675 ±0.245	0.027
	After			
	Mean ± SD	-1.945 ±0.144	-2,251 ±0,289	0.000
	Difference			
	Mean ± SD	0.847 ±0.023	0.423 ±0.300	0.000

While in the table 3 showed the result of Mann Whitney's test, indicated that there were significant mean differences between the intervention and control group in term of weight (intervention 1.316; control 0.903), height (intervention 1.586; control 1.030), weight-for-height (W/H) z-score (intervention 0.713; control 0.595), weight-for-age (W/A) z-score (intervention 0.717; control 0.531), and height-for-age (H/A) z-score (intervention 0.847; control 0.423) with p-value < 0.05. In other words, the indicators of height, weight, and z-scores in the intervention group were higher than those indicators in the control group. Thus it could be said that there were significant effects of honey on infant's height and weight as an indicator of the nutritional status.

Table 4. Effect of Honey on infant's weight (coefficient beta)

Variable	Weight (OR 95% CI)
Intervention group	1.628
Infant's age (post)	0.053
Infant's weight	1.534
Mother's age	0.103
Mother's height	0.136
Mother's education	0.790
Father's Education	0.956
Mother's Job	0.834
Father's Job	1.411
Energy sufficiency (post)	0.054
Protein sufficiency (post)	0.107
Upper respiratory tract infection	0.825
Diarrhea	0.868

The linear regression test as shown in table 4 indicated that the weight difference in the intervention group was higher (1.628) compared with the weight in the control group. But, after being controlled and manipulated by the other variables, it was found that the older the age of the infants, the weight was increased (0.053 kg); and fathers who worked hard, the infant's weight was 1.411 kg.

Table 5. Effect of honey on Infant's height

Variable	Height (OR 95% CI)
Intervention group	0.806
Infant's age (post)	0.219
Infant's weight	-0.056
Mother's age	0.025
Mother's height	0.054
Mother's education	0.615
Father's Education	0.016
Mother's Job	0.309
Father's Job	1.135
Energy sufficiency (post)	0.019
Protein sufficiency (post)	0.009
Upper respiratory tract infection	0.267
Diarrhea	0.170

The linear regression test on height difference in table 5 showed that there was a height increase 0.8 cm in the intervention group compared to the height in the control group. After being controlled by other variables, it showed that father's job had an influence on the infant's height 1.1 cm.

DISCUSSION

Assessment of nutritional status of children in this study used indicator of

height-for-age (H/A), and weight-for-height (W/H). Height is a measurement that describes the state of skeletal growth. In normal circumstances, height increases with age. The influence of nutrition deficiency in height will appear in a relatively long time. Therefore, H/A indicator describes cronic nutritional problems.[16] Changes in body weight are very vulnerable to changes in the condition of the body, such as disease, lack of appetite and intake. Under normal circumstances, the body weight will be in line with the growth in height at a certain speed. Indicator of weight-for-height is more appropriate to assess the nutritional status at this time, or describe the acute nutritional problems. The W/A indicator is used as one measurement of nutritional status and better reflect current nutritional status of a person, while H/A indicator describes the nutritional status in the previous period.[3]

Findings of this study showed that there were significant mean differences between the intervention and control group in term of weight, height, weight-for-height z-score, weight-for-age z-score, and height-for-age z-score with p-value < 0.05. In other words, the indicators of height, weight, and z-scores in the intervention group were higher than those indicators in the control group. Thus it could be said that there were significant effects of honey on infant's height and weight as an indicator of the nutritional status.

These findings, however, were in line with the previous study, indicated that there is a significant correlation between the administration of honey to increase appetite in children,[10,11] and there was an effect of honey on nutritional status of children suffering from undernourishment and malnutrition.[11,17] On the other hand, honey given to children aged 13-36 months who suffer from undernourishment could also increase appetite by 60%. The proportion of samples that can eat a lot increased by 50% and eating frequency was increased by 31%.[11] These however would increase the consumption of energy and nutrients, especially protein. This study proved that honey has an effect on nutritional status of children.

Honey in this study contains energy, protein, vitamins, carbohydrates, iron, minerals, and folic acid. It is a substance derived from plant nectar collection gathered, modified and stored in the honeycomb by honey bees.[8] Honey is a pure product without the addition of other substances, including water and other sweeteners. It contains nutrients that can improve appetite and keep the immune system that will protect children from infectious diseases such as upper respiratory tract infection and diarrhea. [8]

In addition, honey carbohydrates include simple types, the average composition is 17.1% of water; 82.4% of total carbohydrate; 0.5% protein, amino acids, vitamins, and minerals.[18] Carbohydrates are mainly comprised of 38.5% of fructose and 31% of glucose. The remaining is 12.9%of carbohydrate made from maltose, sucrose and other sugars. In this regard, a tablespoon of honey can supply 64 calories. [18] Moreover, honey is very useful for the body as a traditional treatment, antibodies, and inhibiting growth of cancer cells / tumors. While the organic acid content in honey includes glycolic acid, formic acid, lactic acid, citric acid, acetic acid, oxalic acid, malic acid and tartaric acid. Free amino acids in honey can help cure diseases, as well as the establishment of a neurotransmitter substance or compound that plays a role in optimizing the brain function. [18]

Factors affecting weight gain is eating process disorder (such as disease), psychological and environmental factor, as well as the state of the neural signals

associated with hormones and enzymes associated with appetite.[18] Honey can be used as nutritional companion for people who want to gain weight. Honey can help the brain to regulate hormone that plays a role in regulating appetite. Ghlerin hormone produced to inflict hunger, which will increase before meals and decrease after meals, so that hunger can be set to gain ideal weight.[19] In addition, leptin hormone plays a role in regulating appetite, absorption of nutrients, and energy optimization. However, this study also revealed the other factors influecning weight gain, namely the infant's age and the father's job. It was found that the older the age of the infants, the weight was increased (0.053 kg); and fathers who worked hard, the infant's weight was increased 1.411 kg. The father's job in this study might be closely related to the economic status of the family to provide the nutrition. However, further study is needed to explore the other factors that related to the changes in nutritional status.

LIMITATION OF THE STUDY

The measurement of nutritional status using anthropometric measurement based on weight and height in this study might not be good enough without medical examinations related to nutritional status such as the clinical, with bio-chemistry and biophysics. On the other hand, a 24-hour food recall method to determine the nutritional intake might have a possibility of bias, especially in terms of predicting food consumption, and mothers ability to recall any foods giving to their children. Additonally, the study also did not examine the factors that influence height, so that the mother can not distinguish whether the mother's height at the present was a genetic influence or the influence of pathological or malnutrition.

CONCLUSION

There was a significant effect of consuming honey on changes in the nutritional status based on z-score of weight-for-height (W/H), weight-for-age (W/A), and height-for-age (H/A). Therefore, it is expected that health providers may consume honey to increase appetite and change nutritional status. In addition, further studies are needed to observe nutritional status with another measurement supported by medical examinations such as: clinical, bio chemistry, and biophysics.

REFERENCES

1. WHO. Children's Environmental Health: Environmental Risks. 2017; http://www.who.int/ceh/risks/en/. Accessed 3 January, 2017.
2. Blössner M, De Onis M, Prüss-Üstün A, Campbell-Lendrum D, Corvalán C, Woodward A. Quantifying the health impact at national and local levels. *WHO, Geneva*. 2005.
3. Cogill B. Anthropometric indicators measurement guide. 2003.
4. World Health O. *World health statistics 2010*: World Health Organization; 2010.
5. Dinkes. *Health Profile of Sumbawa Regency, West Nusa Tenggara*: Department of Health of Sumbawa, West Nusa Tenggara, Indonesia;2014.
6. Foster BJ, Leonard MB. Measuring nutritional status in children with chronic kidney disease. *The American journal of clinical nutrition*. 2004;80(4):801-814.
7. Benson T, Shekar M. Trends and issues in child undernutrition. 2006.
8. Standifer LN. Honey bee nutrition and supplemental feeding. *Beekeeping in the United States*

Agriculture Handbook. 1980;335:39-45.
9. Larson-Meyer DE, Willis KS, Willis LM, et al. Effect of honey versus sucrose on appetite, appetite-regulating hormones, and postmeal thermogenesis. *Journal of the American College of Nutrition*. Oct 2010;29(5):482-493.
10. Hamidi MNS. HUBUNGAN PEMBERIAN MADU TERHADAP NAFSU MAKAN PADA BALITA DI DESA RANAH KECAMATAN KAMPAR KABUPATEN KAMPAR TAHUN 2014.
11. nugraeny l. PENGARUH PEMBERIAN MADU TERHADAP STATUS GIZI BALITA DI DESA TOBING JAE KECAMATAN HURISTAK KABUPATEN PADANG LAWAS TAHUN 2015. *Jurnal maternal dan neonatal*. 2016-06-24 2016(1):25-34%V 21.
12. Ri KK. Survei demografi dan kesehatan Indonesia 2012. *Jakarta. Kemenkes RI*. 2013.
13. Fitri N, Jafar N, Indriasari R. STUDI VALIDASI SEMI-QUANTITATIF FOOD FREQUENCY QUESTIONNAIRE DENGAN FOOD RECALL 24 JAM PADA ASUPAN ZAT GIZI MIKRO REMAJA DI SMA ISLAM ATHIRAMAKASSAR. 2013.
14. Makuituin F, Jafar N, Najamuddin U. STUDI VALIDASI SEMI-QUANTITATIF FOOD FREQUENCY QUESTIONNAIRE (SQ-FFQ) DENGAN FOOD RECALL 24 JAM PADA ASUPAN ZAT GIZI MAKRO REMAJA DI SMA ISLAM ATHIRAMAKASSAR. 2013.
15. Bardosono S. Penilaian Status Gizi Balita (Antropometri)2005.
16. World Health O. Nutrition Landscape Information System (NLIS). *Country profile indicators: interpretation guide. Nutr Landsc Inf Syst NLIS Geneva WHO*. 2010.
17. Luttinger P. *Bees Honey in Substitute Infant Feeding*: AR Elliot Publishing Company; 1922.
18. Purbaya JR. Mengenal dan memanfaatkan khasiat madu alami. *Cetakan*. 2007;1:42-43.
19. Guyton AC. *Human physiology and mechanisms of disease*: WB Saunders Co; 1992.

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