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RELATIONSHIP BETWEEN THE USE OF IODINE SALT AND THE GROWTH AND DEVELOPMENT OF BABIES

Hubungan Antara Penggunaan Garam Beryodium dengan Pertumbuhan dan Perkembangan Pada Balita

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ABSTRACT

Iodized salt is salt that has iodine, which the body needs to make hormones that regulate the growth and development of intelligence. ***Background****: Iodized salt used as consumption salt must meet the Indonesian National Standard (SNI) containing as much as 30-80 ppm.* ***Purpose****: The research objective was to determine the relationship between the use of iodized salt and the growth and development of toddlers*. ***Methods****: The research design used was correlational analytic with a cross-sectional approach. The population in this study were all mothers of children under five at Campurejo Health Center totaling 93, with the simple random sampling technique obtained a sample of 40 respondents. The instruments used are the iodine test, measuring instrument (scale, height measurement), Z table, and KPSP.* ***Results****: The results of the study were analyzed using the Spearman Rho test. Based on the results of the study, it shows that the P-value is 0,000 <α (0.05) Ho is rejected, that is, there is a relationship between the use of iodized salt and growth and based on the Spearmen'rho statistical test, the P-value <α (0.05) obtained P-value is 0.002. Ho is rejected, meaning that there is a relationship between iodized salt and the development of toddlers.* ***Conclusion****: It is recommended that parents be able to provide nutrition, especially the provision of iodized salt which is suitable for toddlers to prevent disturbances in growth and development.*

Keywords: *iodized salt, growth, development*

ABSTRAK

Garam beryodium adalah garam yang telah diperkaya dengan yodium yang dibutuhkan tubuh untuk membuat hormon yang mengatur pertumbuhan dan perkembangan kecerdasan. **Latar Belakang:** Garam beryodium yang digunakan sebagai garam konsumsi harus memenuhi Standar Nasional Indonesia (SNI) mengandung sebanyak 30-80 ppm. **Tujuan:** Tujuan penelitian untuk mengetahui Hubungan Antara Penggunaan Garam Beryodium Dengan Pertumbuhan Dan Perkembangan Pada Balita. **Metode:** Desain penelitian yang digunakan adalah *analitik korelasional* dengan pendekatan *crossectional.* Populasi dalam penelitian ini adalah semua ibu balita yang ada di Puskesmas Campurejo berjumlah 93, dengan teknik *simple random sampling* diperoleh sampel sebanyak 40 responden. Instrumen yang digunakan yaitu alat ukur iodium tes, alat ukur (timbangan, pengukur tinggi badan), tabel Z dan KPSP. **Hasil:** Hasil penelitian kemudian dianalisis menggunakan Uji *Spearman Rho.* Berdasarkan hasil penelitian menunjukkan bahwa P value adalah 0,000 < α (0,05) Ho ditolak yaitu ada hubungan antara penggunaan garam beryodium dengan pertumbuhan dan berdasarkan uji statistic spearmen'rho nilai P value < α (0,05) didapatkan P value adalah 0,002 maka Ho ditolak artinya ada hubungan antara garam beryodium dengan perkembangan balita. **Kesimpulan:** Disarankan agar orang tua mampu memberikan nutrisi khususnya pemberian garam beryodium yang sesuai pada balita agar dapat mencegah terjadinya gangguan pada pertumbuhan dan perkembangan.

Kata kunci: garam beryodium, pertumbuhan, perkembangan

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INTRODUCTION

In 2015, the Ministry of Health conducted Nutritional Status Monitoring (PSG), this is a cross-sectional study by obtaining samples from families with children under five throughout Indonesia. According to the 2015 PSG results, 29% of toddlers in Indonesia are in the short category. The prevalence of stunting is still a problem in public health, if the prevalence is 20% or more. Because the percentage of short children under five in Indonesia is high and this is a health problem that must be followed up and resolved. (Buletin Jendela Data dan Informasi Kesehatan, 2018)

The incidence of malnutrition in children under five is a nutritional problem in Indonesia. Based on Nutritional Status Monitoring (PSG) data for the last 3 years, namely in 2015 the incidence of under-nutrition, namely 18.8% in 2016, decreased by 17.8%, in 2017 it was reported to be 17.8% in addition to malnutrition, another problem was the incidence of under-five children with stunting (short) has the highest prevalence compared to other nutritional problems such as malnutrition, thinness, and obesity. The prevalence of short children under five has increased from 2016, namely 27.5% to 29.6% in 2017 (Buletin Jendela Data dan Informasi Kesehatan, 2018)

Data from the Kediri City Health Office in 2015 experienced a growth disruption of around 20.12% and in 2016 decreased by about 18% then in 2017 it decreased again to around 16.70%, for the development of children under five in 2015 there were around 20% who experiencing motor problems, in 2016 it decreased by around 18.12% and in 2017 it decreased again by around 15% (Dinkes Kota Kediri, 2018).

From the results of the preliminary survey at Campurejo Health Center in the last 2 months, it was found that 40 children under five, 5 children under five (12.5%) who experienced growth disorders with thin and very thin characteristics. Meanwhile, in the development of 7 toddlers (17.5%) with doubtful characteristics. From the data above, it was found that there was still a high incidence of growth and development disorders at Campurejo Health Center in 2019.

One of the causal factors that affect the development of children is nutritional factors. Malnutrition in children will have an impact on limited growth, susceptibility to infection, and ultimately can hinder children's development. So that children need to get nutrition from daily food in the right amount and good quality (Noviyanti, 2016)

Malnutrition that is categorized as more severe and chronic does not only interfere with growth (stunting), but can also cause a decrease in the number of cells in the brain and cause the biochemical organization in the brain to be immature and imperfect. This situation can affect the development of children's intelligence. The cause of changes in metabolism in the brain, especially if it occurs during the golden period (3 years) of growth and development of the child's brain, is malnutrition in the past. This will cause the brain's inability to function normally (Khomsan, 2012)

The solution is the importance of knowledge and motivation of mothers towards changing attitudes in the way of caring for their children and the behavior of feeding their children. Regarding the nutritional intake given or food intake such as nutrients, one of which is iodine, iodine is a type of mineral found in nature, both in soil and in water, micronutrients needed for the growth and development of living things (Lopriore et al., 2004) . Iodine is needed to form the hormone thyroxine, which is needed by the body to regulate growth and development from fetus to adulthood.

According to WHO (1997), the body needs of iodine is 50 mg / day at the age of 0-12 months, 90-120 mg / day at the age up to 11 years, 150 mg / day for adolescents and adults and 200 mg / day for pregnant women / lactation (Budiman, 1993). Iodine consumption is determined by the behavior of housewives in choosing salt (Mazarina, 2012).

The golden period is during the toddler years (1-5 years) and at this time the nutritional needs require more nutrients. The golden period is very important for physical and mental development, and toddlers do a lot of doing and discovering new things. An important role is to provide good nutrition (Hasdianah et al, 2014).

There are four aspects that are included in the monitoring, namely gross motoric aspects, fine motoric aspects, aspects of speech and language aspects as well as socialization and independence. Through early detection of deviation in child development is

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an effort to detect deviations in the development of infants and toddlers. With early detection, problems in child development can be identified early so that treatment can be done earlier and the child's growth and development can be optimal (Depkes, 2010).
Based on the background above, it is likely that growth and development can occur since there are several factors that affect growth and development, thus the authors are interested in emerging this issue for research, with the title "Correlation between Iodized Salt and Growth and Development in Toddlers". This study aims to determine correlation between the usage of iodized salt with growth and development in toddlers.

METHOD

The research design used in this study was correlational analytic with a cross sectional approach. In this study, the population was all toddlers at Campurejo Health Center (93 toddlers). After being calculated using a sample size formula, 40 toddlers who live in Campurejo Health Center were taken as samples. This study employed Simple Random Sampling technique for sampling. The instrument used to collect data on the independent variable (X) was iodized salt using an iodine measuring test instrument. Collecting the dependent variable (Y1), Growth, were undertaken with a measuring instrument (weighing) table Z score (Y2), Development, using KPSP at Puskesmas Campurejo, Mojoroto District, Kediri City in January 2019. Bivariate analysis in this study was employed to discover the linkage between the independent variable and the dependent variable. The independent variable (X) was iodized salt, and the dependent variable (Y1) was growth,. The linkage was discovered using the Spearman rank test, while the linkage between independent variable (X) or iodized salt with the dependent variable (Y2) or development were discovered using the Spearman rank as well.

RESULTS

Characteristics of Respondents Based on the Salt Used by Mother

Table 1. Frequency Distribution of Respondent Characteristics Based on the Salt used by the Mother at the Campurejo Public Health Center in 2019

Iodized Salt	Frequency (f)	Percentage (%)
Changed to purple	19	47.5%
Unchanged	21	52.5%
Total	40	100%

Source: Primary data in 2019

Based on table 1, it can be interpreted that most of the respondents did not use iodized salt, since the results of the iodine test showed that 21 respondents used salt that did not change to purple (52.5%).

Characteristics of Respondents Based on Toddler Growth

Table 2. Frequency Distribution of Respondent Characteristics Based on Toddler Growth at Campurejo Public Health Center in 2019

Growth	Frequency (f)	Percentage (%)
Obese > 2 SD	9	22.5%
Normal -2 to 2 SD	26	65.0%
Underweight -3 to -2 SD	2	5.0%
Extremely underweight -3 SD	3	7.55
Total	40	100%

Based on Table 2, it can be interpreted that most of the children under five with normal growth of -2 to 2SD were 26 children (65.0%).

Characteristics of Respondents Based on Toddler Development

Table 3. Frequency Distribution of Respondent Characteristics Based on Toddler Development at Campurejo Public Health Center in 2019

Development	Frequency (f)	Percentage (%)
Normal	33	82.5%
Suspected	7	17.5%
Abnormal	0	0.0%
Total	40	100%

Based on Table 3, it can be interpreted that most of toddlers were normal developed as many as 33 toddlers (82.5%). We can find that 0 toddler abnormal.

Correlation between the Usage of Iodized Salt and Toddlers Growth at Campurejo Public Health Center in 2019

Table 4. Cross Tabulation of Correlation between Iodized Salt and Toddlers Growth at Campurejo Public Health Center in 2019

	Iodized Salt	Growth								Σ	%
		Obese	%	Normal	%	Underweight	%	Extremely underweight	%		
	Changed to purple	9	22.5	9	22.5	0	0.0	1	2.5	19	100
	Unchanged	0	0.0	17	42.5	2	5.0	2	5.0	21	100
	Total	9	22.5	26	65.0	2	5.0	3	7.5	40	100
P value=0.000				α=0.05				correlation coefficient =5.29			

Based on table 4, it can be interpreted from 40 respondents that 3 toddlers (7.5%) were extremely underweight since they did not use iodized salt. Two (5.0%) were underweight, 26 toddlers (65.0%) were normal, while nine toddlers (22.5%) were obese.

Based on the spearmen'rho statistical test, the value of P value <α (0.05), the P value was 0,000, thus Ho was rejected. This implied that there was a correlation between iodized salt and the growth of toddlers at Campurejo Health Center in 2019. Correlation coefficient value was 5.29, the strength of the correlation was moderate, correlation direction was poditive. It meant that the higher the respondents who did not use iodized salt, the higher the growth disturbance occurred.

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The Relationship between the Use of Iodized Salt and the Toddlers' Growth at the Campurejo Public Health Center in 2019

Table 5. Cross tabulation of the Relationship between Iodized Salt and the Toddlers' Growth at the Campurejo Public Health Center in 2019

Iodized Salt	Growth							
	Normal	%	Doubtful	%	Storage	%	∑	%
Change into purple	20	50,0	0	0,0	0	0,0	19	100
Did not change into purple	13	32,5	7	17,5	0	0,0	21	100
Total	32	82,5	7	17,5	0	0,0	36	100
P value=0,002		α=0,05		correlation coefficient =4,74				

Based on table 5, from the 40 respondents, there were 7 toddlers doubtful (17.5%) because they did not use iodized salt. Whereas, there were 19 toddlers who were normal (47.5%). According to the spearman'rho statistical test, the value of P value <α (0.05), the P value was 0.002, so Ho was rejected, it means that there was a relationship between iodized salt and the growth of toddlers at Campurejo Public Health Center in 2019. Correlation coefficient value was 4.74, the strength of the relationship was moderate, the direction was positive relationship, and it means that the higher the respondents who did not use iodized salt, the higher the disruption to development.

DISCUSSION

The use of iodized salt affects the nutritional status of children (TB / U) because iodine is a nutrient that plays a role in growth. Iodine is an essential nutrient for the body, because it is a component of the hormone thyroxin. There are two organic bonds that indicate the bioactivity of this hormone, namely triiodotyronin (T3) and tetrajodotyronin (T4) or thyroxin. Iodine is concentrated in the adenoids (thyroxin glands) to be used in the synthesis of the hormone thyroxin which plays a role in regulating and maintaining most of the metabolism that occurs in the body. This hormone is stored in adenoids follicles, conjugated with a protein (globulin) called thyroglobulin which is a form of iodine that is stored in the body. Thyroglobulin is broken down and will release the thyroxin hormone released by the glandular follicle into the bloodstream when needed. T3 compounds function to control the basal metabolic rate of cells. Iodine is needed to help the production of T3 compounds during the growth and development process. If the T3 compound levels are less due to insufficient iodine needs, the basal cell metabolic rate will be low, which can result in disruption and inhibition of the growth and development process. Impaired physical growth and mental retardation are the result of iodine deficiency. This has also been suggested in several studies (Zahraini, 2009). The next impact of iodine deficiency disorder is the low learning achievement of school-age children as well as low work productivity for people maturity and the emergence of various socio-economic problems in society that can hinder development (Depkes, 2005).

Based on the spearman'rho statistical test, the value of P value <α (0.05), the P value is 0.002, so Ho is rejected, meaning that there is a relationship between iodized salt and the growth of toddlers at Campurejo Public Health Center in 2019. Correlation coefficient value is 4.74, the strength of the relationship is moderate, direction is a positive relationship, and it means that the higher the respondents who do not use iodized salt, the higher the incidence of disruption growth. Improving the development of toddlers can be conducted by providing balanced nutritional intake to children such as providing calories, protein and vitamin A, iodine, iron, vitamins, and other minerals. Toddlers who are growing and developing are a vulnerable group to iodine deficiency and need protection. An estimated two billion people worldwide are deficient in

iodine intake. Iodine deficiency is currently seen as the only low cost preventable cause of brain damage to prevent developmental disruption in children. The World Health Organization recommends the use of iodized salt as the best way to overcome the problem of iodine deficiency (Yulia, 2017).

Toddler period is an important period for child growth because the basic growth that occurs during toddlerhood will influence and determine the next child's development. During the growth and development period, children need nutrients thus the growth and development process runs according to their age. Nutritional substances consumed by toddlers will affect the nutritional status of toddlers, differences in nutritional status of toddlers have a different impact on each child's development, if the balanced nutrition consumed is not fulfilled, the achievement of children's development, especially good motor development, will be hampered (Suhartiningsih, 2013).

Hence, it can be concluded that most of the toddlers in the working area of the Campurejo Community Public Health Center have developmental disorders that are not suitable for the age of the toddlers, due to the lack of knowledge of respondents about the importance of iodized salt for the development of toddlers.

CONCLUSION

1. The use of iodized salt for toddlers at the Campurejo Public Health Center in 2019 most of them did not use iodized salt
2. Toddler growth at Campurejo Public Health Center in 2019, some toddlers were thin (5.0%) and very thin (7.55%)
3. The growth of Toddlers at Campurejo Public Health Center in 2019, some toddlers whose development was doubtful (17.5%)
4. There was a relationship between the use of iodized salt and growth in toddlers at Campurejo Public Health Center in 2019.
5. There was a relationship between the use of iodized salt and the growth of toddlers at Campurejo Health Center in 2019

SUGGESTION

It is recommended that parents provide nutrition, especially the provision of iodized salt which is suitable for toddlers in order to prevent disturbances in growth and development.

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