

# Effect of Vitamin A and Zink Intake of Breastfeeding Mothers on Infection in Infants

Lydia Fanny<sup>1</sup>, Retno Sri Lestari<sup>1</sup>, Hijrah Asikin<sup>1</sup>

<sup>1</sup>Department of Nutrition, Health Polytechnic of Makassar, Indonesia

## ABSTRACT

**Background:** Breastmilk is an important nutrient for newborn baby that can improve health and reduce morbidity so the babies are expected to achieve an optimal growth and development according to their abilities so that later they can become a nation's successor with high quality and competitiveness. However, giving exclusive breastfeeding based on The "Basic Health Research" is increasingly alarming, namely the average coverage of exclusive breastfeeding in 2013, which was 67.80% and decreased by 61.0% in 2014. Ministry of Health of Republic of Indonesia in 2017 set a target of achieving 44% Exclusive Breastfeeding, but the achievement was 35.7%.

**Purpose:** Knowing the effect of Vitamin A and Zink Intake for Breastfeeding Mothers on Infection in Infants in the Sudiang Raya Health Center.

**Method:** This research was an survey with cross sectional design. Sample were breastfeeding mother that selected by simple random sampling. The collected data were analyzed using contingency coefficient.

**Result:** In general breastfeeding mothers get less vitamin A and zinc. The frequency of infection was twice that of 59.79 percent. The results of the Spearman test showed p-value = 0.000, with a correlation coefficient marked negative, so it was concluded that the intake of vitamin A breastfeeding mothers correlated with the frequency of infectious diseases in infants.

**Conclusion:** Reduced intake of vitamin A will have an impact on increasing the frequency of infections in infants.

**Keywords:** *Vitamin A, Zinc, Breastfeeding, Infection, Infant*

## INTRODUCTION

Exclusive breastfeeding is very useful for reducing child morbidity and improving maternal health, in accordance with one of the goals of the Sustainable Development Goals (SDGs), which is to ensure that children consume exclusive breastfeeding during the first 6 months after birth. Mother's milk not only provides benefits for 'mother and baby health', but also has high economic and practical value. In addition, breast milk

contains important nutrients that can improve health and reduce infant morbidity, so that they can achieve optimal growth and development according to their abilities, so that later they can become qualified future generations and have high competitiveness and productivity<sup>(1)</sup>.

Children who get breast milk early, generally have a better immune system than those who do not get breast milk. Children who are not breastfed, their development is hampered, or the quality of their development is not optimal<sup>(2)</sup>.

The percentage of exclusive breastfeeding in infants 0-6 months in Indonesia in 2013 was 54.3% (lower than the condition in 2012, which was 48.6%). The coverage of exclusive breastfeeding for infants aged 0-6 months in South Sulawesi Province is 56.02%. The percentage coverage of exclusive breastfeeding in 2013 at Sudiang was 40.13%. The percentage of exclusive breastfeeding

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### Corresponding Author:

Lydia Fanny

Paccerakkang Street, Km: 14, Number: 77,

Paccerakkang, Biring Kanaya,

Makassar, Indonesia, 90241

Email: lydiafanny90@yahoo.com

for infants 0-6 months in the work area of community health centers in Makassar in 2011 was 36.8%, in 2012 it was 63.7% and in 2013 it was 67.8%. This achievement is lower than the target of the National Development Program and National Strategy<sup>(3)</sup>. In 2015, the Ministry of Health of the Republic of Indonesia had set a target for achieving exclusive breastfeeding as outlined in the strategic plan. The target of exclusive ASI achievement in 2017 was 44%, but the national achievement was only 35.7%<sup>(4),(5)</sup>.

Based on the explanation above, it is important to conduct research on the effect of intake of Vitamin A and zinc for breastfeeding mothers on the incidence of infection in infants in the Sudiang Raya Health Center, Makassar.

## MATERIALS AND METHOD

The design of this study was cross sectional, which was conducted in the Paccerrakkang Daya Village, Makassar. The sample was selected using a systematic sampling technique with the help of random number tables. The variables in this study were: 1) intake of vitamin A and zinc for breastfeeding mothers, obtained through interviews, with the help of food recall = 3x24 ja; 2) the incidence of infection in infants obtained through filling in questionnaires. Data was collected by trained enumerators with an educational background in Applied Nutrition Bachelor, Makassar Health Polytechnic graduates. Categorical data types are presented in the form of frequency and percentage<sup>(6)</sup>, then analyzed using the contingency coefficient test.

## FINDINGS

Distribution of vitamin A and zinc intake from breastfeeding mothers is presented in Table 1 and Table 2. It appears that in general breastfeeding mothers get less vitamin A and zinc.

**Table 1: Distribution of Vitamin A Intake of Breastfeeding Mothers**

Vitamin A Intake	Frequency	Percentage
More	8	8.25
Sufficient	9	9.28
Less	80	82.47
Total	97	100.00

**Table 2: Distribution of Vitamin A Intake of Breastfeeding Mothers**

Zinc Intake	Frequency	Percentage
More	0	0.00
Sufficient	0	0.00
Less	97	100.00
Total	97	100.00

The distribution of incidence of infection in infants is presented in Table 3. It appears that the frequency of infection was twice that of 59.79 percent.

**Table 3: Distribution of Twice Infections in Infants**

The incidence of infections	Frequency	Percentage
Never	17	17.53
Once	7	7.22
Twice	58	59.79
Thrice or More	15	15.46
Total	97	100.00

**Table 4: Effect of Vitamin A Intake of Breastfeeding Mothers on the Incidence of Infection in Infants**

No.	Vitamin A Intake	The Incidence of Infection in Infant				Total
		Never	Once	Twice	≥ Thrice	
1.	Less	1 (1.3%)	7 (8.8%)	57 (71.3%)	15 (18.8%)	80 (100%)
2.	Sufficient	9 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	9 (100.0%)
3.	More	7 (87.5%)	0 (0.0%)	1 (12.5%)	0 (0.0%)	8 (100%)
Total		17 (17.5%)	7 (7.2%)	58 (59.8%)	15 (15.5%)	97 (100%)
Spearman Rank ( $\alpha = 5\%$ )		p-value = 0.000, r = - 0.368				

Based on Table 4 it is known that the results of the Spearman test showed p-value = 0.000, with a correlation coefficient marked negative, so it was concluded that the intake of vitamin A breastfeeding mothers correlated with the frequency of infectious diseases in infants. In this case, reduced intake of vitamin A will have an impact on increasing the frequency of infections in infants.

## DISCUSSION

In general, breastfeeding mothers in Paccerrakkang Daya Village get less vitamin A. Low vitamin A intake often occurs in developing countries. Lack of intake of vitamin A will reduce the body's resistance to infectious diseases and cause growth delay<sup>(7)</sup>. Vitamin A has an important role in maintaining health and survival. Vitamin A deficiency in children will increase the risk of infectious diseases, increase mortality, and cause growth delay. Vitamin A content in breast milk is influenced by maternal vitamin A intake, both in terms of quantity and quality.

Vitamin A also supports the function of vision, reproduction, growth, immunity, and plays an important role in the differentiation, proliferation and delivery of signals in cells. Vitamin A, protein and zinc are related to one another in order to support the process of growth and development<sup>(2)</sup>. Research on breastfeeding mothers in Brazil, showed that serum retinol was higher in the group given vitamin A intake than the group that carotenoid intake<sup>(9)</sup>. In his research, Zakaria reported that referring to recommended daily needs, breastfeeding mothers' intake of vitamin A was in the less category<sup>(10)</sup>.

The results showed that all mothers experienced a lack of zinc intake. Similar results were reported by Chen Halijao that zinc consumption in the nursing mothers group was lower than the nutritional adequacy rate<sup>(11)</sup>. In his research, Zakaria also reported that zinc intake in nursing mothers was lower than recommended daily needs<sup>(10)</sup>.

Zinc has an important role in various functions in the body. In the metabolic process, zinc plays a role in reactions related to the synthesis and degradation of carbohydrates, proteins, fats, nucleic acids, and vitamin A. Zinc acts as an integral part of the enzyme DNA polymerase and RNA polymerase. Zinc is needed to stabilize the DNA binding protein structure by regulating gene expression. Zinc is part of the collagenase enzyme, which plays a role in the degradation of collagen<sup>(12)</sup>.

Zinc deficiency due to lack of food intake and bioavailability is still a problem in developing countries including Indonesia. The result will affect the composition of nutrients in breast milk which ultimately affects the quality of the milk.

The results showed that the frequency of infection was the most twice (59.8%). Problems with malnutrition

and malnutrition are directly affected by food consumption and infectious diseases; and indirectly by parenting, food availability, socio-economic, cultural and political factors<sup>(13)</sup>.

Nutrients are very important for life. Nutrient deficiency in children can cause several negative effects such as slow body growth, more susceptibility to disease, decreased health status and mental disruption of children. Lack of consumption of nutrients can cause serious problems, namely death in children<sup>(14)</sup>.

One nutrient that is very influential on the immune system is vitamin A and zinc. Both work together to help increase a child's immunity<sup>(8)</sup>. If the intake of vitamin A is given in sufficient quantities when the child is in an infectious condition, then vitamin A will fight the infection, resulting in a decrease in the degree of infection<sup>(14)</sup>.

This is consistent with research conducted on children aged 6-24 months. The results of the study showed that there was a decrease in the incidence of diarrhea/infection in children who were given zinc supplementation, vitamin A and multi micronutrients, so that death could be prevented<sup>(16)</sup>.

Zinc and beta-carotene supplements in pregnant women will affect the development of newborn immunity and significantly affect the decrease in the incidence of morbidity in infants<sup>(17)</sup>.

## CONCLUSION

Vitamin A intake can reduce the frequency of infectious diseases in infants in Paccerrakkang Daya Village, Makassar, Indonesia.

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