

# Correlation of Nutritional Status with The Degree of Diarrhea in Toddlers in Srikandi Room at RSUD Jombang

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## ABSTRACT

### Keywords:

*nutritional status, degree of diarrhea, toddlers*

Low nutritional status of toddlers may interfere metabolic processes in their body which cause infection such as diarrhea. The purpose of this study was to determine the relationship between nutritional status and the degree of diarrhea of toddler in the Srikandi Room at RSUD Jombang. The research design used was correlational analytic with cross sectional design. The independent variable was nutritional status on the dependent degree of diarrhea. While the sampling technique, it applied consecutive sampling, with a total sample of 39 toddlers. The nutritional status instrument for toddlers uses observations based on body mass index according to age (BMI/U) and the degree of diarrhea uses observations based on medical records, then the results of statistical tests: Pearson correlation with a significance level of 0.05. The results showed that: half of the respondents had normal nutritional status (56.9%), more than half of the respondents had mild dehydration (51.3%). From the pearson correlation statistical test, it was obtained p-value (0.000) < ( $\alpha = 0.05$ ), then H1 was accepted. Based on the results of the study, it can be concluded that there is a significant relationship between nutritional status and the degree of diarrhea of toddler in the Srikandi Room of RSUD Jombang. Therefore, mothers of toddlers are expected to improve the nutritional status of their children and always monitor it regularly through the *posyandu Balita*. It is intended that mothers understand that the nutritional status of children is good. Besides, it is to prevent diarrhea.

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## 1. INTRODUCTION

Diarrhea is an environmental disease which occurs in almost every geographic world. It is one of the main causes of death in children in developing countries (1). Toddlers' diarrhea is defined as the develop of daily stool volume exceeding the upper limit, which is 10 mg/kgBW/day (2). In developing countries, toddler generally has diarrhea periods of 3 times a day. In each periods, nutrition for growth and development is disrupted due to diarrhea. Therefore, diarrhea is a major factor in malnutrition of children (3). Low nutritional status of toddlers may interfere metabolic processes in their body which cause infection such as diarrhea (4).

According to UNICEF data, it is estimated that 1.5 million children die each year due to diarrhea (5). In the same time, the target coverage of services for toddler's diarrhea who come to health facilities is 20% of the estimated number of sufferer's toddler's diarrhea (the incidence of toddler's diarrhea times the number of children under five in one work area within one year). In 2018, the number of toddler's diarrhea sufferers served in health facilities was 1,637,708 or 40.90% of the estimated diarrhea in health facilities. Meanwhile, the number of diarrhea sufferers served in health facilities throughout Indonesia was 1,637,708 of toddler's diarrhea, and in East Java, there were 232.398 of toddler's diarrhea (6).

From the data on the number of toddler's patients at the Srikandi room RSUD Jombang, from July to September 2020, there were 127 toddlers. Meanwhile, the nutritional status with the incidence of diarrhea in July 2020 were 36 toddlers, with details; there was a status of 10 toddlers (27.78%) undernourished, 7 toddlers (19.44%) had severe malnutrition, while 6 toddlers (16.67%) have diarrhea.

In August, there were 42 toddlers with nutritional status as follows; 10 toddlers (23.81%) had poor

nutritional status, and 8 toddlers (19.05%) had poor nutritional status, while 8 toddlers had diarrhea (19.05%). In September, there were 49 toddlers with nutritional status; 14 toddlers (28.57%) were poor, and 5 toddlers (10.20%) were poor, while those who had diarrhea were 13 children (26.53%). The nutritional status of toddler is the main thing that must be maintained by every parent. The nutritional disorders of toddler are due to the mismatch of the quantity of nutrition they get from food with the necessities of their bodies (7).

Nutritional disorders are affected by primary or secondary factors. Secondary factors include all factors that cause nutrients not to grasp the body's cells after food is consumed, for example factors that cause digestive disorders, such as digestive tract structural abnormalities and enzyme deficiencies. The primary factor is the incorrect food composition in quantity and or quality which is caused by a lack of food supply, poverty, food distribution, ignorance, wrong eating habits, and etc (8). Poor nutritional status and the occurrence of diarrhea is like a circle. It is difficult to break, since both are interrelated and exacerbate each other. Chronic infectious conditions will cause malnutrition and it also has a bad impact on the defense system, making it easier for infection to occur. Malnutrition is a disorder where a body has lack of essential nutrients. Nutritional status correlates to the incidence of diarrhea for the children. If they have poor nutritional status, resistance to pressure or stress decreases, the immune system and antibodies are reduced, so they are susceptible to infections such as diarrhea.

Diarrhea in toddlers with liquid stool consistency, is accompanied with an increase of frequency > 3 times a day, which may cause dehydration, acid-base balance disorders, hypoglycemia, nutritional disorders and circulatory disorders in the form of shock or hypovolemic shock. As a result, tissue perfusion is reduced while hypoxia occurs, acidosis gets worse which can lead to bleeding in the brain, decreased consciousness and if they are not immediately helped, the patient may die (9).

A good diet needs to be implemented as an effort to meet nutritional needs (10). Since good nutrition plays an important role in achieving optimal body growth. This optimal body growth includes brain growth which greatly determines the intelligence of toddlers (11). Managements of nutritional problems, needs to be carried out in an integrated method, between departments or health centers (*Posyandu*, *Puskemas*, hospitals and others) and professional groups (midwives, nurses, and doctors). It can be done through increasing food, diversification of food production and consumption and balanced in nutritional quality. These efforts are conducted by providing information and education to the community regarding efforts to improve nutrition (12).

Based on the above phenomenon, it is interested to conduct a study under the title: "The relationship between nutritional status and the degree of toddler's diarrhea in at Srikandi Room of RSUD Jombang".

## 2. METHOD

This study applied correlational analysis. It is a statistical method used to measure the strength of the linear relationship between two variables and compute their association. Hence, this study would investigate "The correlation between nutritional status and the degree of toddler's diarrhea at the Srikandi Room at RSUD Jombang". Furthermore, this study also applied cross sectional approach. It is research design implemented by measurement or observation, including general data of respondents, family support variables, anxiety level variables which is carried out simultaneously at one time (13).

The population in this study were all patients of toddlers from July to September in the Srikandi Room at RSUD Jombang. On average, there are 42 children in the room per month. consecutive sampling was used as a data collection technique. Finally, there were 39 of toddlers as samples. The instrument in this study was a questionnaire. The content was the nutritional status of toddlers by applying observations based on body mass index according to age (BMI/U), while the degree of diarrhea uses observations based on medical records.

The procedure for collecting the data: Requesting a cover letter from the Head of the S1 Nursing Study Program, FIK Unipdu Jombang, to conduct research at the Jombang Hospital. Furthermore, a letter was given to the Head of the Srikandi Room at the RSUD Jombang. Data collection was carried out after obtaining the feasibility of an ethical test. Next, an informed consent form was given to the respondents who came and they received an explanation of the aims and objectives of the study. If the respondent agrees, then the respondent was asked to sign the consent form to become a research respondent. Observing the nutritional status of toddlers based on age (BMI/U), and medical records was categorized as diarrhea based on the degree of dehydration (14).

Collecting the results of questionnaires about toddler's nutrition, and the results of observations or observations of nutritional status in toddlers was grounded by age (BMI/U), and the degree of diarrhea using observations/observations was grounded on medical records, then the measurement results are then recorded as well as data processing. The data processing was carried out, includes: editing, coding, scoring, tabulating, and data analysis was performed using the Pearson correlation test with a significance level of 0.05.

### 3. RESULT AND DISCUSSION

Tabel 1 Frequency distribution of general characteristics of respondents in the Srikandi room at RSUD Jombang

No.	Characteristic of General Responden	Frequency (f)	Percentage (%)
1.	Age of toddler's mother		
a.	< 20 years	4	10,3
b.	20-35 years	26	66,7
c.	> 35 years	9	23,1
2.	Occupation of toddler's mother		
a.	Housewife	20	51,3
b.	Private employees	8	20,5
c.	enterpreneur	7	17,9
d.	farmer	0	0
e.	Civil servant	4	10,3
3.	Educational background of toddler's mother		
a.	Elementary(SD, SMP)	0	0
b.	High school (SMA, SMK)	32	82,1
c.	Higher education (University)	7	17,9
No.	Characteristic of General Responden	Frequency (f)	Percentage (%)
4.	Obtaining information about nutrient for toddler		
a.	Obtain information	35	89,7
b.	Do not obtain information	4	10,3
5.	Resource about nutrient for toddler		
a.	Do not obtain information	4	10,3
b.	Non medical staf	7	17,9
c.	Medical staf	19	48,7
d.	Mass Media (newspaper, magazine and etc)	0	0
e.	Electronic Media (TV, radio and etc)	9	23,1
6.	Gender		
a.	Boy	21	53,8
b.	Girl	18	46,2
7.	Age		
a.	< 1 year	0	0
b.	1-3 year	17	43,6
c.	4-5 year	22	56,4

Resource: Primary Data

Based on table 1 above, it shows that most of the respondents were 20-35 years old (66.7%), while a small proportion of respondents were > 35 years old (23.1%). In addition, more than half of the respondents (51.3%) work as housewives, and the rest were as civil servants (10.3%). Furthermore, in education aspect, most of the respondents had secondary education (SMA, SMK) (82.1%), and the rest (17.9%) have higher education at university level.

Meanwhile, most of respondents (89.7%) received information about nutrition for toddlers. Meanwhile the rest (10.3%) of respondents did not get it. Furthermore, the source of information about nutrition for toddlers, there were (48.7%) the respondent got it from health workers, 17,9 % were from non medical staff, and 23, 1% were from electronic media such as TV, radio and etc. Meanwhile, (10.3%) of respondents do not get information.

Moreover, based on the gender of toddler, more than half of the respondents were male (53.8%), and (46.2%) of the respondents were female. Furthermore, based on the age of toddlers, more than half (56.4%) of the respondents were 4-5 years old, and (43.6%) of the respondents were 1-3 years old.

Tabel 2 Frequency Distribution of Respondents on Nutritional Status of Toddlers in the Srikandi Room, RSUD Jombang

No.	Toddler Nutrient status	Frequency (f)	Percentage (%)
1.	Very skinny	2	5,1
2.	Thin	14	35,9
3.	Normal	22	56,4
4.	Fat	1	2,6
	Total	39	100

Based on table 2, it shows that 56, 9 of toddlers include in normal category, while the rest 2,6 % is fat.

Tabel 3 Frequency Distribution of Respondents on the Degree of Diarrhea in Toddlers in the Srikandi Room, Jombang Hospital

No.	Degree of Diarrhea in Toddlers	Frequency (f)	Percentage (%)
1.	Diarrhea without dehydration	19	48,7
2.	Diarrhea with mild dehydration	20	51,3
3.	Diarrhea with severe dehydration	0	0
	Jumlah	39	100

Based on table 3, it shows that 51,3% has diarrhea with mild dehydration, while (48,7%) got diarrhea with no dehydration.

Tabel 4 The Relationship between Nutritional Status and Degree of Toddlers Diarrhea in Srikandi Room, RSUD Jombang

No.	Status Gizi Pada Balita	Diarrhea							
		without dehydration		mild dehydration		severe dehydration		Total	
		f	%	f	%	f	%		
1.	Very skinny	0	0	2	5,1	0	0	2	5,1
2.	thin	0	0	14	35,9	0	0	14	35,9
3.	Normal	18	46,2	4	10,3	0	0	22	56,4
4.	Fat	1	2,6	0	0	0	0	1	2,6
	Total	19	48,7	20	51,3	0	0	39	100
Pearson correlation (r) = 0.753, p-value = 0.000; α = 0.05									

Pearson correlation (r) = 0,753, p-value = 0,000;  $\alpha = 0,05$

Based on table 4, 46,2% of toddlers include in normal category of nutrient status in which they got diarrhea without dehydration. Meanwhile, 5, 1% toddlers include in fat category in which they got diarrhea without dehydration. The correlation among variables of nutrient status with diarrhea degree of toddlers show sturdy correlation level which pearson correlation has 0,753. This correlation has positive pattern which means that a better of toddlers' nutrient status, diarrhea occurrence is low or without dehydration. Meanwhile, based on statistical test, it shows that  $p$ -value (0,000), smaller than alfa ( $\alpha = 0,05$ ). It means that there is a significant relationship between nutritional status and the degree of toddler's diarrhea.

## DISCUSSION

### 1. Nutritional Status of Toddlers in Srikandi Room, RSUD Jombang Hospital

The results of the study in table 2 show that more than half of the respondents had the normal category of nutritional status (56.9%), and a small percentage of the obese category (2.6%).

Nutrition is a process of organisms using food that is consumed normally through the processes of digestion, absorption, transportation, deviation, metabolism and excretion of substances that are not used, to maintain life, growth and normal function of organs., and produce energy (15). Meanwhile, according to Adnani (2018), nutritional status is the level of health that a person achieves as a result of consuming food. According to (16), the cause of malnutrition is not only due to lack of food but

also due to infectious diseases. Children who are well fed but often have diarrhea or fever may suffer from malnutrition. The indirect causes are food security in the family, child care patterns, and health and environmental health services.

From the results of the data above, the nutritional status of more than half of the respondents is in the normal category. According to the information found in the field, verbally, the mother of the toddler said that every day the child was always given food that had adequate nutrition. Normal nutrition in a good sense can provide an adequate contribution to growth and development in toddlerhood which includes protein, fat, carbohydrates, minerals, vitamins, and water which must be consumed in a balanced manner, with the amount as needed, 3 times a day. In toddlerhood especially during the period of rapid growth and development requires more calories and protein. Therefore, the role of parents, especially mothers, is necessary in supporting the growth and development of toddlers, especially through efforts to fulfill a balanced nutritional intake which includes rice, side dishes, vegetables, fruits and milk in sufficient quantity and quality. good, while toddlers with nutritional status are very thin, thin and fat. This is because parents pay less attention to what toddlers consume and the possibility of hygiene in food patterns is not paid attention to, such as: food ingredients that are not clean, food behavior is not good (before food forget not to wash hands), so children are easily exposed to illness.

The nutritional status of more than half of the respondents in the normal category cannot be separated from the influencing factors, which are seen in terms of parents' occupations. Table 5.1 shows that more than half of the respondents work as housewives (51.3%), and a small proportion of civil servants (10.3%). Work is an activity to earn a living, looking at the data in the field that the observed work is the work of mothers of toddlers. However, based on verbal communication with mothers of children under five, it was stated that family income was sufficient to meet daily needs in the family. The dominant economy in influencing food consumption is family income and prices. An increase in income will increase the opportunity to buy food with better quantity and quality, on the contrary, a decrease in income will cause a decrease in food purchasing power both in quality and quantity (17).

From the description above, the mother is indirectly able to buy foodstuffs which have high nutritional worth. However, being unable to get nutritious food does not lie in the ability to buy food ingredients, but an understanding of the food ingredients obtained whether the food ingredients obtained have nutritional value or not, so that mothers understand the menu. nutritious food leads to the quality of nutritional status in toddlers.

From the point of view of the education of parents of toddlers. Table 1 shows that most of the respondents have the latest secondary education (SMA, SMK) (82.1%), and a small portion of the last education is tertiary education (17.9%). According , education in this case is usually associated with knowledge, which will affect the selection of food ingredients and the fulfillment of nutritional needs. one example, the principle that someone with low education usually has is that it is important to be filling, so that the portion of food sources of carbohydrates is more than that of other food groups. On the other hand, groups of people with higher education tend to choose protein sources and will try to balance them with other nutritional needs.

From the description above, it shows that in general, mothers of children under five have good knowledge due to education and getting information about nutrition in toddlers. Knowledge is an important capital in providing nutritious food to toddlers, even though they are able to provide or buy food ingredients but mothers don't know what food ingredients have nutritional value for toddlers which can result in the quality of nutritional status in toddlers.

Information reviewed. Table 1 shows that most of the respondents received information about nutrition for toddlers (89.7%), and a small proportion of respondents did not get information about nutrition for toddlers (10.3%). On the source of information, almost half of the respondents the source of information about nutrition in children under five from health workers (48.7%), and a



small part of the respondents did not get information (10.3%). Information is notification of new knowledge for additional knowledge. Providing information is to raise awareness of a motivation that affects knowledge. According to (18), that nutritional problems due to lack of knowledge and skills in the field of cooking reduce children's consumption, the diversity of ingredients and the diversity of types of dishes that affect the psyche, for example boredom.

From the description above that the nutritional status of toddlers is more than half of the respondents in the normal category due to the information obtained and sources of information, most parents of toddlers get information about toddler nutrition, and the information is obtained from health workers, of which almost half parents of toddlers are the source of information. information from health workers. This indirectly affects the cognitive abilities of parents of toddlers, which leads to the provision of quality food menus for toddlers.

From the description above, it can be concluded that in general, mothers of toddlers understand very well food ingredients that have good nutritional value for toddlers because they are supported by knowing well what they get from getting information about nutrition for toddlers, so that toddlers get food that is quite good in their needs. nutrition which leads to good quality nutritional status. However, not all toddlers in the Srikandi room at Jombang General Hospital had good nutritional status, only more than half of the respondents had normal nutritional status, while the rest had underweight, very thin and fat nutritional status. Toddlers who have this nutritional status, it does not mean that mothers of toddlers do not know foods that have good nutritional value for toddlers, but there is a high probability of eating patterns such as rarely or even not washing hands before and after food, water used hygiene or not, so that the immune system is low which leads to toddlers often getting sick. It is because of this that mothers of toddlers pay less attention to toddlers so that toddlers have a thin and very thin nutritional status.

## **2. Degree of Diarrhea in Toddlers in Srikandi Room at RSUD Jombang**

The results of the study show that more than half of the respondents had diarrhea with mild dehydration (51.3%), and almost half of the respondents had diarrhea without dehydration (48.7%). According to WHO, diarrhea is defecation with a soft or liquid consistency 3 or more times in 1 day, or with a frequency that is more frequent than usual (19). Stool may be accompanied by blood, mucus, fat, and undigested food particles. Parents are usually worried about the color difference in their child's stool, but in general only stools that are red, black or white are a sign of danger. Complications of diarrhea result in fluid and electrolyte deficiencies (20). Diarrhea that lasts for a while without adequate medical treatment can cause death due to lack of body fluids resulting in hypovolemic shock or due to biochemical disturbances in the form of advanced metabolic acidosis (21).

From the description above, the degree of diarrhea in children under five is categorized as more than half of respondents with mild dehydration and almost half of respondents with diarrhea without dehydration. This relates to the handling of toddlers when suffering from diarrhea. Toddlers without dehydration because the toddler's mother immediately took the toddler to the hospital the first time the toddler suffered from diarrhea, so that the toddler received early treatment that didn't lead to dehydration, while based on the category that toddler had diarrhea with mild dehydration, this was found at the time of the study. The general condition of toddlers is fussy, eyes look sunken, and toddlers feel thirsty (appendix). Diarrhea with mild dehydration due to toddlers before MRS was not given the first treatment, namely ORS administration, and in addition to fluid loss that was not balanced with adequate nutritional intake.

However, in general, toddlers in the Srikandi Room of RSUD Jombang who suffer of diarrhea are most likely to have diarrhea in toddlers because they are infected with bacteria that cause inflammation and release toxins that cause diarrhea. This is based on the information from the mother of the toddler on the sidelines of the nursing care for the toddler, the mother stated that the mother always provides adequate nutritional food intake, it is most likely that the toddler has diarrhea due to lack of healthy and clean living behavior, although the study was not conducted.

research on healthy and clean living behavior. Seeing that the cause of diarrhea in toddlers is due to bacterial infection, then indirectly diarrhea does not pay attention to life behavior (before food, forget not to wash hands), or eat snacks outside that have been contaminated with bacteria, so that children have the potential to be infected with bacteria that cause diarrhea. This is in line with (22), the playing behavior of toddlers who still do not understand games or dirty conditions that can spread germs, such toddler habits should be prevented by the role of parents or people around them who understand clean and healthy living behavior, While the same thing is stated in the research of Wiharto, within the scope of the household to behave in a clean and healthy life from the aspect of public health, especially the pattern of the spread of infectious diseases (such as diarrhea) can be prevented through hygiene habits or behavior, one of which is using clean water. , the habit of washing hands with soap, and using healthy latrines.

### 3. The Relationship between Nutritional Status and Degree of Diarrhea in Toddlers in Srikandi Room, RSUD Jombang Hospital.

From the results of the study shows that almost half of the respondents with nutritional status in the normal category with diarrhea without dehydration (46.2%), while a small proportion of the respondents in the nutritional status in the obese category with diarrhea without dehydration (5.1%). The relationship between nutritional status variables and the degree of diarrhea in children under five is a strong relationship where the Pearson correlation ( $r$ ) value is 0.753. This relationship has a positive pattern, meaning that the better the nutritional status of toddlers, the lower the degree of diarrhea in toddlers or diarrhea without dehydration. Statistical test results show  $-value$  (0.000) which is smaller than  $\alpha$  ( $\alpha = 0.05$ ).

Poor nutritional status (malnutrition) ranges from diarrheal diseases. Diarrhea is caused by a bacterial, viral or parasitic infection. Bacterial infections that cause malnutrition due to decreased food intake, decreased absorption of nutrients in the small intestine and increased catabolism of nutrients needed for tissue repair. Conversely, malnutrition can also be a predisposing factor for infection due to a decrease in intestinal mucosal barrier protection and trigger changes in the patient's immune function, thereby increasing the risk of infection, especially enteral infections, while enteral infections cause diarrhea in toddlers (23).

Toddler is a tough period because the child's health condition is still unstable and susceptible to infectious diseases that result in poor nutritional status, and vice versa that poor nutritional status can cause toddlers to be susceptible to diseases, one of which is diarrhea, this is related to the immune system in infancy. still not stable. From the results of the study, almost half of the respondents were in the normal category of nutritional status with diarrhea without dehydration. This incident can be presumed that the food consumed is contaminated by bacteria, this is in line with (24), that there are toddlers who have good nutritional status but experience diarrhea, this is because the trigger for diarrhea is not only nutritional status but there are several factors that contribute to this. For example, digestive tract infections are the main cause of diarrhea in children. In toddlers, a small proportion of respondents' nutritional status in the very thin category with mild dehydration diarrhea, it is suspected that the low immune system leads to underweight or poor nutritional status which has an impact on the health of toddlers, namely children are easily infected with bacteria that cause diarrhea. This is in line with the research of Black et al quoted in the research of (25), concluding that nutritional status does not significantly affect the incidence of diarrhea in children under five which leads to dehydration, but is most likely related to the duration of diarrhea. Black et al quoted in the research of (26) also stated that it should be noted that the relationship between nutritional status and the duration of diarrhea in this study occurred in diarrhea caused by *E.coli* and Shigella, there is no data that explains this relationship.

The researcher assumed that looking at the research data that the nutritional status is good, thin, very thin and fat toddlers with diarrhea are caused by infection with bacteria that cause diarrhea. However, this study also proves that good nutritional status is very important in providing protection to toddlers against disease, which shows that toddlers with good nutritional status do not have diarrhea with dehydration. Thus the nutritional status of toddlers is closely related to the degree of diarrhea. This is evidenced from the results of statistical tests which state that there is a significant

relationship between nutritional status and the degree of diarrhea in children under five in the Srikandi Room of RSUD Jombang. This is in line with the opinion of (27), in his research stating that poor nutritional status increases the risk of severe diarrhea than good nutritional status. Children with diarrhea are more susceptible to dehydration than adult patients due to differences in body fluid composition and limited ability of children to meet their own fluid needs freely.

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#### 4. CONCLUSION

There is a significant relationship between nutritional status and the degree of diarrhea in children under five in the Srikandi Room at RSUD Jombang.

#### 5. SUGGESTION

The results of this study might be used for mothers in improving the nutritional status of toddlers. They have always to monitoring the nutritional status of children by visiting *posyandu*. Therefore, mothers will understand that good nutritional status in children greatly affects the health of toddlers, specifically the degree of diarrhea. Thus the mother will pay attention to the quantity and quality of the food menu given to the child, based on balanced menu.

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