Original Research Article

Relationship of Giving Complete Basic Immunization to the Nutritional Status of Toddlers at Integrated Healthcare Centre (*Posyandu*) of Unra Village, Awangpone District, Bone Regency

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ABSTRACT

The toddler period is a very important period in the process of growth and development which is the basis for determining the quality of the nation's next generation. In addition, during infancy is also the most vulnerable to health problems. This is caused by several factors, one of which is immunization. Immunization is an effort to actively cause/increase a person's immunity against a disease, so that if one day they get the disease they will not get sick or only experience a mild illness. Nutrition is the process of using food normally consumed by an organism through the process of digestion, absorption, transportation, storage, metabolism and release of substances not used to sustain life. Nutritional problems in toddlers are very vulnerable to the incidence of infection, so that infection in toddlers often occurs in children who are not immunized, this is due to immunization as a preventive measure made to induce or actively increase a person's immunity against a particular disease and can prevent death every year in all age groups due to diphtheria, tetanus, pertussis, measles, and malnutrition. This research was conducted at Unra Village, Awangpone District, Bone Regency, on June 2022. This research used a cross-sectional approach with a sample size of 135 people. Determination of the sample using the different proportion hypothesis test formula. Data analysis techniques include univariate analysis and bivariate analysis with the chi square test. The results of the analysis revealed that from 138 respondents, 29.8% were stunted.

INTRODUCTION

The toddler period is a very important period in the process of growth and development which is the basis for determining the quality of the nation's next generation. In addition, during infancy is also the most vulnerable to health problems (Trisutrisno, Hasnidar and Mustar, 2022). This is caused by several factors, one of which is immunization. Giving immunizations to toddlers will not only provide prevention for these children, but will have a much wider impact because it will prevent widespread transmission by increasing immunity (body's resistance to certain diseases) in general in the community.(Karina and Warsito, 2012). Immunization can prevent around 2 to 3 million morbidity every year. However, around 19.4 million babies in the world still miss complete basic immunization, global immunization coverage is stagnant at 86% without any significant changes over the past few years and around 60% of these babies come from 10 countries, one of which is Indonesia.(WHO, 2019).

Growth disordersThis can be demonstrated by the large number of cases of malnutrition which shows the health of the Indonesian people the lowest in ASEAN, and is ranked 142 out of 170 countries.(Nura Sucianti Fauzia 2018). The incidence of underweight

toddlers in Indonesia from 2019 to 2021 has increased by 0.7%, from 16.3% to 17%.(RI Ministry of Health, 2021)

Achievement of basic immunization in Indonesia in the last 5 years has been above 85%, but has not yet reached the set target. In 2018 the coverage of basic immunization in Indonesia was 90.61%, this figure is still lower than the 2018 target of the Ministry of Health's Strategic Plan (Renstra) of 92.5%.(RI Ministry of Health, 2020).

Complete basic immunization coverage from 2016 to 2018 has fluctuated, namely in 2016 it was 91.88%, in 2017 it increased by 100%, and in 2018 it decreased by 61%.(RI Ministry of Health, 2018)

South Sulawesi Province in 2021 the incidence of underweight and wasted is still above the national prevalence, namely 19% and 6.2% respectively(RI Ministry of Health, 2021). The results of Basic Health Research (Riskesdas) show the trend in the prevalence of stunting in South Sulawesi Province. The 2018 Riskesdes results show that the prevalence of stunting under five has decreased significantly, namely by 35.6%, from 2010 it was 36.8% increasing to 40.9%, from 2013, the 2018 Riskesdes results pointed to the prevalence of stunting under five in the Province South Sulawesi has again decreased to 30.9% until the end of 2019 from the results of the Nutrition Surveillance Monitoring (PSG), it is hoped that by the end of the RPJMD period later, the prevalence of stunting toddlers in South Sulawesi can reach 25%(Baso, 2019)

Data from the Bone District Health Office in 2018 who received DPT, Hb. Hib, totaling 9190 people (69.1%), and those who received Measles and MR Immunization totaled 1114 people (63.5%). Whereas in 2019 those who received DPT, Hb, and Hib immunizations experienced an increase, namely 10,201 people (79.4%), and those who received Measles and MR immunizations experienced a decrease in the number of children who received, namely 9,746 people (75.9%). Whereas in 2020 DPT, Hb, Hib, Measles and MR immunizations have decreased by 8499 people (69.7%), from 2018 and 2019(Dinkes Bone, 2022). The results of these data indicate that in Bone District there are still problems in monitoring the nutritional status and participation of toddlers in participating in the complete basic immunization program.

LITERATURE REVIEWS
A. Immunization
1. Definition of Immunization
Immunization is one type of business that can provide immunity to children by injecting vaccines into the body which aims to form antibodies to prevent diseases that can be prevented by immunization including polio, measles, hepatitis B, tetanus, pertussis, diphtheria, pneumonia , and meningitis(Linda Rofiasari and Pratiwi, 2020). The way immunization works is by giving certain bacterial or viral antigens that have been weakened or killed with the aim of stimulating the body's immune system to form antibodies.(Ministry of Health, 2017)

2. Immunization Benefits
According to Pritasari (2016) the benefits of immunization are not only felt by the government by reducing morbidity and mortality from diseases that can be prevented by immunization, but also felt by:
a. For Children: Prevent suffering caused by disease, and possible disability or death.
b. For Families: Relieving anxiety and psychological treatment when children are sick. Encourage the formation of a family when parents believe they will have a comfortable childhood. This encourages the preparation of a planned family, so that it is healthy and of good quality
c. For the State: Improving the level of health creates a strong and intelligent nation to continue the country's development

3. Types of Immunizations
In the Regulation of the Minister of Health Number 42 of 2013 concerning the implementation of immunization, article 6

states that basic immunization is immunization given to infants before they are 1 (one) year old. The types of basic immunization in infants consist of:

a. Hepatitis B immunization of newborns

Hepatitis B immunization is immunization given to cause active immunity against hepatitis B, an infectious disease that can damage the liver. Now at least 3.9% of pregnant women have active hepatitis B with a risk of transmitting it to their babies by 45%. The Ministry of Health, starting in 2005, gave the hepatitis B-0 monovalent vaccine (in uniject packaging) at birth, followed by the DPT/Hepatitis B combination vaccine at the age of 2-3-4 months(Afriana, 2016).

Hepatitis B vaccine must be given immediately after birth, considering that hepatitis B vaccination is a very effective prevention effort to break the chain of transmission through maternal transmission from mother to baby. The hepatitis B vaccine should be given 12 hours after birth provided that the baby's condition is stable, there are no problems with the lungs and heart. The vaccine is administered intramuscularly. (Afriana, 2016).

b. Bacillus Calmette Guerin (BCG) Immunization

DPT-hb-Hib immunization is given 3 times, namely 2, 3 and 4 months. The first step for babies who have never been immunized. If you have first received this first immunization, continue the second until giving the third dose, while giving the vaccine is not allowed for children with a history of severe allergies and encephalopalopathy(Cahyono, 2010)

c. Immunization of Diphtheria Pertussis Tetanus-Hepatitis B (DPT-HB) or Diphtheria Pertussis Tetanus-Hepatitis B- Hemophilus influenza type B (DPTHB-HiB).

This vaccine is used for the simultaneous prevention of diphtheria, tetanus, pertussis (whooping cough), hepatitis B and Haemophilus influenza type b infection. The Strategic Advisory Group of Expert on Immunization (SAGE) recommends that the Hib vaccine be combined with DPT-HB to become a pentavalent vaccine (DPT-HB Hib) to reduce the number of injections in infants(Notoadmojo, 2017).

d. Polio immunization

Immunizations are carried out to create immunity against poliomyelitis, which is an inflammatory disease that causes paralysis of the legs and attacks the nerves(Maryuni, 2010).

Polio immunization is divided (Polio I, II, III, IV) When polio is given, there are conditions that must be considered, namely if a child suffering from the definition of immunity cannot be given polio. and there is no danger that could result from being given polio immunization for children who are sick(Proverawati Atikah, 2010).

e. Measles vaccine immunization

Immunization of the attenuated virus against measles and its benefits to create active immunity against measles is given once at the age of 9 months. Side effects that occur are mild fever or redness of the cheeks under the ears(Maryuni, 2010).

Measles immunization is intended to provide active immunity against measles. Measles vaccine is given once at the age of 9 months subcutaneously, although it can be given intramuscularly at a dose of 0.5 ml. Furthermore, the second dose of measles immunization is given to school programs, namely routinely to grade 1 elementary school children in the BIAS program. (Maryuni, 2010)

B. Toddler

1. Definition of Toddlers

Toddlers are individuals or groups of individuals from a population within a certain age range. Toddler age can be grouped into three groups, namely infant age groups (0-2 years), toddler groups (2-3 years), and preschool groups (> 3-5 years). According to WHO, the age group for toddlers is 0-60 months. Other sources say that the age of toddlers is 1-5 years(Adriani and Wirjatmadi, 2016)

2. Characteristics of Toddlers

Children aged 1-5 years are passive consumers, meaning that children receive food from what their mothers provide. Under these conditions, toddlers should be introduced to a variety of foodstuffs. The growth rate of toddlerhood is greater than that of preschool age so that a relatively larger amount of food is needed. However, a stomach that is still smaller means that the amount of food it can receive in one meal is smaller than a child who is older(Proverawati and Asfuah, 2009)

3. Toddler Growth

Assessment of growth and development includes evaluation of physical growth (curve or graph of weight, height, head circumference, chest circumference and abdominal circumference), evaluation of teeth growth, neurological evaluation, and social development and evaluation of youth.(Adriani and Wirjatmadi, 2016)

C. Nutrition
1. Nutritional Substances

Nutrients are needed by the body to carry out its basic functions. Nutrients must be obtained from food, because the human body does not synthesize them or make them itself. Nutrients are used to produce energy, detect and respond to the surrounding environment, move, excrete waste, breathe, grow, and reproduce. In general, there are six types of nutrients that the body needs to function and maintain overall health, namely carbohydrates, proteins, fats, vitamins, minerals and water.(Purba et al., 2022).

2. Nutritional status

Consumption of food and the results of the work of nutrients consumed from food that have an impact on the condition of our body is referred to as nutritional status(Purba et al., 2022).The nutritional status during infancy needs serious attention from parents, because malnutrition at this time will cause irreversible (irreversible) damage. Short body size is one indicator of prolonged malnutrition in toddlers(Proverawati and Asfuah, 2009)

3. Assessment of Nutritional Status Based on Weight/Age and Height/Age Index

Assessment of nutritional status in Indonesia uses the World Health Organization National Center for Health Statistics (WHO-NCHS) anthropometric standards as shown in the table below(Soekirman, 2000):

Table 2 Nutritional Status Rater

No.	Index used	Grouping Limits	Nutrition Status Designation
1.	BB/U	<-3 SD	Malnutrition
		-3 to <-2 SD	Malnutrition
		-2 to + 2 sd	Good Nutrition
		>+ 2SD	More Nutrition
2.	TB/U	<-3 SD	Very short
		-3 s/d < -2 SD	Short
		-2 to +2 SD	Normal
		>+2SD	Tall

MATERIALS & METHODS
A. Types of research

This type of research is descriptive analytic research with a cross sectional study approach where independent and dependent variable data collection is carried out at the same time. This research is analytic in nature because it will look at the relationship between complete basic immunization and the nutritional status of toddlers at Unra Village

B. Population and Sample
1. Population

The population is all toddlers in the working area of Posyandu Unra

Village at. Awangpone District Bone Regency 2022 is 135 people.

2. Sample

Determination of the sample using accidental sampling, namely a sampling technique based on coincidence, that is, anyone who coincidentally met the researcher at the time of data collection at Unra Village, Awangpone District. The number of samples needed in this study is based on calculations using the Lemeshow formula.So the sample in this study were 55 toddlers consisting of *Posyandu* Merpati Putih 1, *Posyandu* Merah Putih 2, *Posyandu* Merah Putih 3, and *Posyandu* Merah Putih 4. The determination of the number of samples for each *Posyandu* was

Merpati Putih *Posyandu* 1 $= \frac{45}{132} \times 55 = 20$

Posyandu Merpati Putih 2 $= \frac{35}{132} \times 55 = 15$

Merpati Putih *Posyandu* 3 $= \frac{24}{132} \times 55 = 10$

Merpati Putih 4 *Posyandu* $= \frac{24}{132} \times 55 = 10$

Sampling was carried out by observing the inclusion and exclusion criteria.

1) Inclusion criteria

From the research population that was used as the sample in this study were toddlers who lived at *Posyandu*, Unra Village, Awangpone District, Bone Regency.
a. Toddlers who are willing to be respondents at Unra Village, Bone District, Bone Regency
b. Toddlers aged 1-5 years.

2) Exclusion criteria

Are criteria or characteristics or populations that cannot be used as samples in research are:
a. Toddlers who are not willing to be respondents
b. The condition of toddlers who experience scoliosis, lordosis, kyphosis

C. Research variable

The independent variable in this study is immunization while the dependent variable is nutritional status

D. Operational definition

Table 3 Operational Definitions

Variable	Operational definition	Measuring instrument	Results Measure	Scale
Immunization	Provision of complete immunization in infants 0-60 months	MCH Book	Yes Not	Nominal
Toddler nutritional status	In the Big Indonesian Dictionary (KBBI) Nutritional status is the condition of the body related to consumption, absorption and use of food in the body.	Observation	>-2 SD Normal <-2 SD Less	Nominal

E. Data Type

This study uses Primary and Secondary data
1. The primary data used is in the form of interviews with toddler mothers regarding the toddler's immunization status
2. Secondary data in this study was in the form of the MCH book, the secondary data used was in the form of the MCH book. To see the completeness of immunization and see the child's growth

STATISTICAL ANALYSIS

After the research data was obtained, the researcher entered the tabulated data into the computer and analyzed it statistically. Data analysis consists of:

1. Univariate analysis

Univariate analysis was used to obtain the frequency distribution and proportion of each variable, namely the characteristics of children under five (age and sex), complete basic immunization, nutritional status (weight/age and height/age), both independent and dependent variables.

2. Bivariate Analysis

The analysis technique carried out is Chi-Square analysis using a 95% degree of confidence with α 5%, so that if the P value (p value) <0.05 means that the results of statistical calculations are significant (significant) or show that there is a relationship between the dependent

variable and the variable independent, and if the p value > 0.05 means that the results of statistical calculations are not significant or there is no relationship between the dependent variable and the independent variable.

RESULTS

Table. 4 Univariate Table Analysis Number of samples (n) =54

Variable	N	%
Age		
0-1 Years	8	14.8
>1-3 Years	23	42.6
>3-5 Years	23	42.6
Total	54	100
Gender		
Man	22	40.7
Woman	32	59.3
Total	54	100
BB/U		
Not enough	23	42.6
Normal	16	29.6
More	15	27.8
Total	54	100
TB/U		
Normal	23	42.6
stunt	31	57.4
Total	54	100
Immunization		
Complete	42	77.8
Incomplete	12	22.2
Total	**54**	**100**

Data source: Secondary data 2022

Table 5. Bivariate Table Analysis

No	Age	BB/U						Total		p-values	OR
		Not enough		Normal		More					
		N	%	n	%	n	%	N	%		
1.	0-1 years	2	25.0	2	25.0	4	50.0	8	100	0.045	2.679 (0.879-9.098)
2.	>1-3 years	15	65.2	4	17,4	4	17.4	23	100		
3.	>3-5 years	6	26.1	10	43.5	7	30.4	23	100		
Total		23	42.6	16	29.6	15	27.8	54	100		

No	Age	TB/U						p-values	OR
		Stunting		Normal		Total			
		n	%	n	%	N	%		
1.	0-1 years	4	50.0	4	50.0	8	100		2.091 (3.71-4,143)
2.	>1-3 years	14	60.9	9	39.1	23	100	0.021	
3.	>3-5 years	5	21.7	18	78.3	23	100		
Total		23	42.6	31	57.4	54	100		

No	Immunization	BB/U								p-values	OR
		Not enough		Normal		More		Total		0.030	
		n	%	n	%	n	%	N	%		3.212 (2.62 - 4.143)
1.	Complete	14	33.3	14	33.3	14	33.3	42	100		
2.	Incomplete	9	75.0	2	16.7	1	8.3	12	100		
Total		23	42.6	16	29.6	15	27.8	54	100		

No	Immunization	TB/U						p-values	QR
		Stunting		Normal		Total			1,212 (2.85 5.133)
		n	%	n	%	N	%		
1.	Complete	13	31.0	29	69.0	42	100	0.001	
2.	Incomplete	10	83.3	2	16.7	12	100		
Total		23	42.6	31	57.4	54	100		

DISCUSSION

Relationship between age and nutritional status (weight/age)

The most important period in child development is at the age of under five years, because basic growth takes place at that time

and will determine the child's further development. In the growth and development of children need nutrients so that the process of growth and development goes well. If the balanced nutrition consumed is not fulfilled, then the achievement of growth in toddlers will be hampered. In this study, the majority of respondents who had poor nutritional status (BB/U) were 15 toddlers (65%) aged 1-3 years. This result is in line with Rosilawati's research (2019) which showed that nutritional status was less common in respondents aged <30 months (Rosilawati, 2019). The results of a statistical test using chi-square showed that there was a significant relationship between age and nutritional status (weight/age) (P=0.045) with an OR of 2.679 (0.879-9.098). These results indicate that age >1 year is more at risk of experiencing poor nutritional status than <1 year. This is because during this period critical growth and growth failure in toddlers begin to appear. Toddlers are an age group that is vulnerable to various diseases. In this period there is a process of rapid growth and development, so that good and balanced nutrition is needed, because if this need is not fulfilled, growth and development will not be optimal and can cause malnutrition problems.(Rosilawati, 2019)

Relationship between age and nutritional status (TB/A)

Nutritional problems are closely related to stunting in toddlers. Stunting is a condition of chronic malnutrition that occurs during a critical period of the process of growth and development of the fetus. OnIn this study, most of the respondents who experienced stunting were in the 1-3 year age group, namely 14 toddlers (60.9%). The results of this study are in linewith opinion(Pranowo, 2021)regarding stunting in toddlers in the Donan Village, Cilacap Selatan District in 2019 which shows that most of the toddlers who experience stunting are aged 24-59 months. Furthermore, the same research was also conducted by(Wahdah, Juffrie and Huriyati, 2016), shows that most of the incidence of stunting in the Interior Regions

of the Salat Hulu sub-district are in the age group of 25-36 months.The results of statistical tests performed using chi-square showed that there was a significant relationship between age and nutritional status (W/A) (P=0.021) with OR 2.091 (3.71-4.143).These results indicate that age >1 year is more at risk of experiencing stunting 2,091 times than <1 year.This can be due to the fact that during this period, the condition of the child can become an active consumer as indicated by the ability to choose the food he likes. Also during this period, the child's condition has not been able to maintain personal and environmental hygiene. Lack of cleanliness causes toddlers to get sick easily and has an impact on lack of appetite. This is what can lead to a lack of nutritional intake in the body, so that the growth of toddlers can be disrupted and can result in stunting (Fadzila and Tertiyus, 2019)

The relationship between immunization and nutritional status (BB/U)

Immunization is one of the factors that affect the body's resistance to various diseases or immunity, which in turn will affect anthropometric nutritional status(Son and Dewi, 2022). In this study, most of the respondents had underweight, normal, and excess nutritional status, namely 14 underfives (65%) each of the underfives who carried out complete basic immunization. As for toddlers who did not carry out complete basic immunization, most of them had poor nutritional status, namely 9 people (75%). These results are in line with research (Hanifah and Sari, 2021), giving incomplete immunization will experience a tendency to have a less nutritional status of toddlers. Vice versa, the more complete the immunization, the better the health status, so that the nutritional status tends to be better. The results of statistical tests using chi-square showed that there was a significant relationship between immunization and nutritional status (B/A) (P=0.030) with an OR of 3.212 (2.62-4.143). These results indicate that toddlers who receive complete immunization are 2,091 times more likely to

have normal nutritional status than those who do not receive incomplete immunization. Immunization is a very important part of getting good nutritional status in toddlers. Providing complete immunization will show the ability of toddlers not to get sick easily, so that children are healthier,(Vindriana, Kadir and Askar, 2012)

The relationship between immunization and nutritional status (TB/U)
Stunting reflects a process of failure to achieve potential linear growth (height) as a result of nutritional status. In this study, the majority of toddlers experienced stunting, namely in toddlers who did not carry out complete basic immunization of 10 people (83.3%). This is in line with research(Sutriyawan et al., 2020)which shows that most toddlers who do not have basic immunizations are incomplete and experience stunting in the working area of the Citarip Health Center in Bandung, namely 71.1%. The results of statistical tests using chi-square showed that there was a significant relationship between immunization and nutritional status (TB/A) (P=0.001) with an OR of 1.212.(2.85-5.133). The results of this study are in accordance with the research(AL Rahmad, Miko and Hadi, 2013)which stated that there was a significant relationship between basic immunization and the nutritional status of toddlers with a value (p = 0.049). Malnutrition can start from an infection that inhibits normal immunological reactions by depleting the body's energy. If toddlers do not have a good immune system, then toddlers will lose body energy more quickly due to infectious diseases, as the first reaction due to infection is a decrease in the child's appetite so that the child refuses food given by his mother. Refusal of food means reduced intake of nutrients in the child's body.Children who do not carry out complete basic immunization will have less immunity against certain infectious diseases, so that the child will fall ill, possibly causing a decrease in nutritional status. This is because infectious diseases and immune function are

closely related to each other, and will ultimately affect nutritional status in the form of decreased nutritional status in children. (Kaunang, Rompas and Bataha, 2016). The final impact of this problem is the failure of optimal growth in accordance with the rate of age increase, which will increase the prevalence of stunting.

CONCLUSION

1. Relationship between age and nutritional status (BB/U)In the analysis of the chi-square test obtained p-value $=value0.045$ or <0.05 means there is a significant relationship. The results of the study show that there is a significant relationship between age and nutritional status (BB/U)Ha is accepted and H0 is rejected .

2. There is a significant relationship between age and nutritional status (TB/A). In the analysis of the chi-square test obtained p-value $=value0.021$ or <0.05 means that there is a significant relationship between age and nutritional status (TB/A)Ha is accepted and H0 is rejected .

3. There is a significant relationship between immunization and nutritional status (BB/U). In the analysis of the chi-square test obtained p-value $=value0.030$ or <0.05 means that there is a significant relationship between immunization and nutritional status (BB/U).Ha is accepted and H0 is rejected .

4. There is a significant relationship between immunization and nutritional status (TB/U).In the analysis of the chi-square test obtained p-value $=value0.001$ or <0.05 means that there is a significant relationship between immunization and nutritional status (TB/U).Ha is accepted and H0 is rejected.

Conflict of Interest: The authors declare no conflict of interest.

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