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The Relationship Between Immunization Completeness and Incidents of Acute Respiratory Channel Infection Amongst Children in the Working Area Of Puskesmas Gintu

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Abstract

Acute Respiratory Infection is caused by viruses, bacteria or fungi. If not handled properly, Acute Respiratory Infections can cause death in sufferers. Complete immunization is one of the early efforts to prevent this complaint. The purpose of this research is to determine the relationship between completeness of immunization and the prevalence of Acute Respiratory Infection in children under five in the working area of the Gintu Health Center. The research is descriptive and analytical with a cross sectional approach. Samples were taken using the simple random sampling technique, and there were 58 respondents. The instrument in the study was a questionnaire. The results were analysed using the *Chi square* formula. The result was P value: 0.000 <0.05, from which it can be concluded that there is a relationship between completeness of immunization and the occurence of Acute Respiratory Infections in children under five.

Keywords: Completeness of Immunization, Incidence of Acute Respiratory Infection, Children

1. Introduction

Acute Respiratory Infection (ARI) is a difficulty breathing disease caused by viruses, bacteria or fungi. If not handled properly, ARI can be at risk of causing death to sufferers. Complete immunization is one of the early efforts to prevent the incidence of ARI. The management pattern for ARD patients consists of four parts, namely the examination of the patient, determining the presence or absence of danger signs, determining

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the classification of the disease, and treating the ARI correctly and appropriately. In determining the classification of ARI disease, there are several groups, namely severe pneumonia, moderate pneumonia and non-pneumonia. Non-pneumonia includes other diseases, such as common cold cough, *pharyngitis* , and *tonsillitis* [41]

The *World Health Organization* (WHO) states that children under five in various countries die every year from ARI. Two thirds of these deaths occur in the infant age group, especially infants in the first 2 months of birth and can kill approximately 2.6 million children annually worldwide [51]

According to the control program, ARI can be divided into 2 groups, namely pneumonia and non-pneumonia groups. Cold cough diseases, such as rhinitis, pharyngitis tonsillitis and other upper airway diseases are classified as ARDs not pneumonia [21]. Efforts to reduce the risk of ARI disease need to be done, namely by giving complete basic immunization, giving vitamin A capsules, and increasing the knowledge of parents in preventing ARI. The government program for every toddler must receive five complete basic immunizations (LIL) which includes 1 dose of BCG, 3 doses of DPT, 4 doses of Polio, 4 doses of Hepatitis B and 1 dose of Measles [21]

The ARI mortality survey in 2005 in 10 provinces showed that pneumonia was the biggest cause of infant mortality, namely 22.3% of all infant deaths. The mortality study according to Riskesdas 2007 also shows that the proportion of deaths in infants due to pneumonia in Indonesia reaches 23.8% and for under-five is 15.5% [21].

In 2011 in Indonesia the incidence of pneumonia increased from the previous year where in 2010 the incidence of pneumonia in children under five reached 499,259 or 23.00%, while in 2011 the incidence of pneumonia in children under five reached 559,114 cases or 23.98%. In North Sulawesi, the incidence of pneumonia in 2011 in children under five reached 2,280 cases or 10.07% with the incidence in children <1 year, namely 765 cases and children aged 1-4 years as many as 1,515 cases [21].

According to data from the Central Sulawesi Provincial Health Office, from January to December 2018 , the number of children under five was 274,155 and those suffering from ISPA were 138,740 children under five. In 2014, from January to August the population of children under five was 276,530 children under five and those suffering from ISPA were 82,823 children under five [12]

The Infant Mortality Rate has improved but still fluctuates in 2013. Infant mortality in Poso District has reached 9.75 per 1,000 live births (the absolute number is reported as 36 cases). The AKB in Poso Regency is already below the MDGs target of 16/1000 KH. The coverage of pneumonia case findings in Poso Regency continues to increase, where in 2010 it was 9.2% of the 60% target, in 2011 it was 36.1% of the 70% target, in

2012 it was 10.3% of the 80 % target , in 2013 amounting to 10.77% of the target of 90% [11].

According to the monthly report of the P2 ISPA program at the Gintu Health Center, Lore Selatan District, Poso Regency from January to December 2018, it was found that 3 villages out of 8 villages ranked the highest in the number of ARI sufferers . Based on the data obtained, in the working area of the Gintu Health Center, the number of cases of ARI is caused by many mothers who have not given complete basic immunization to toddlers, especially for DPT immunization [12].

At an international conference about ARI in Canberra Australia. In July 2003 it was revealed that 4,000,000 children under five in developing countries die every year due to ARI. In Indonesia, under-five mortality due to this disease is the largest [13].

ARI itself is more common in children, especially toddlers, than in adults. This is because the airways in children are still narrow and their immune system is still low [27]. Research in developing countries shows that an average child experiences 5-7 episodes of ARI attacks per year. Every 4 minutes, one under-five death due to ARI is 5 per 1000 under five [20]

Although the available data is limited, recent studies still show evidence that the risk factor for ARI is the lack of Measles Immunization, BCG and DPT immunization which causes under-five mortality [1].

According to Marimbi, H. (2010) ARI will also be very influential if the completeness of immunization is not complete. Immunization is one way to actively give a person immunity against infectious diseases. Immunization is a specific immune system . Immunization consists of several types, namely: BCG immunization, DPT / HB immunization, polio immunization, measles immunization, and Hb-0 immunization.

The results of the study related to immunization status indicated that there was a relationship between pneumonia sufferers who received incomplete and complete immunization, and it was statistically significant. According to research conducted by Tupasi (1985), in the research of Suhandayani (2017), states that non-compliance with immunization is associated with an increase in ARI sufferers. Infants and toddlers who have had measles and who have survived will get natural immunity to pneumonia as a complication of measles. hence increasing the coverage of immunization will play a big role in efforts to eradicate ARI [45]

DPT immunization is a vaccine that protects against diphtheria, pertussis and tetanus. Diphtheria is caused by bacteria that attack the throat and can cause serious or fatal complications. This disease is easily transmitted through coughing or sneezing. Pertussis (whooping cough) is a bacterial infection of the airways characterized by a

persistent severe cough and a high-pitched breath sound. Pertussis can also cause serious complications, such as pneumonia, seizures and brain damage. Tetanus is a bacterial infection that can cause stiffness in the jaw and spasms [23].

Southwestern vaccine protection Dif t eri good enough that is equal to 80-90%, power protection Tetanus vaccine is 90-95%, but power pertussis vaccine protection is still low at 50-60%, therefore, the children are still likely to be infected cough a hundred days or pertussis, but lighter. DPT immunization provides mild and severe side effects, mild effects such as swelling and pain in the injection area and fever, while the severe effects of babies crying because of pain for approximately four hours, decreased consciousness, seizures and shock [33].

Based on the preliminary research survey, the results of data obtained from the General Polytechnic Source of the Gintu Community Health Center in 2019 obtained data on the number of ARI sufferers in the Gintu Puskesmas working area as many as 139 people with an average age of 1-5 years. Researchers also obtained data on the 10 largest diseases in the Puskesmas area, namely Acute Respiratory Infections (ISPA) and the most dominant occurring in children under five, ARI is in the top rank of the 10 largest diseases with a percentage of 12.4% (384 people) (profile data Gintu Health Center). Based on a survey on the percentage of infant immunization coverage according to the Gintu Health Center in 2019 , babies who were given BCG, DPT1 + HB1, DPT3 + HB3 immunization, polio 3, measles and hepatitis B3 were 97.94%.

From the results of interviews with 5 mothers who had babies with Acute Respiratory Infection (ISPA) , 3 of them said that they did not routinely bring their babies to the posyandu because they were afraid that their children would get sick or have a fever after being immunized , the mother said it would be troublesome if her child sick. Meanwhile, 2 people said that their children did not receive complete immunizations because they were lazy to bring their children to the posyandu services because the house was quite far from the posyandu service places, and the mother also said they did not get information about immunization .

From the observations of researchers at one of the posyandu in the working area of the Gintu Public Health Center, it was seen that some children experienced Acute Respiratory Infections (ISPA) , one of the causes was incomplete immunization .

Based on the foregoing, the researcher was interested in knowing the relationship between the completeness of immunization and the incidence of ARI in children under five in the working area of the Gintu Health Center .

2. Research Methods

Research design or design is the whole of planning to answer research questions and anticipating difficulties that can occur during the research process [29] The design of this research is descriptive quantitative research with a cross-sectional approach which is a research design in which measurements or observations are carried out simultaneously at one time or one time [18]. Each research subject was observed only once and measurements were made of the character status or subject variables at the time of examination [42]. In this study using a survey in order to test the theoretical model hypothesis to confirm the tested variables. This research was conducted to determine the relationship between the completeness of immunization and the incidence of ARI in children under five in the working area of the Gintu Health Center.

2.1. Population, Sample and Research Sampling

The population taken in this study were all mothers of children under five in the working area of the Gintu Health Center with a number of respondents with 139 toddlers (data for January-May 2019 at Puskesmas Gintu).

The sample size required is calculated using the Slovin formula according to [29] So with this formula, the number of samples in this study was 58 people . The sampling technique used in this study was *Simple Random Sampling* , which is a *random sampling* method in which each population has an equal chance of being selected as a sample with inclusion and exclusion criteria. The size or number of sample distribution for each room using the formula according to [43]

2.2. Data analysis

2.2.1. Univariate Analysis

Done to get an overview by describing each variable used in the study, namely in the form of frequency distribution.

2.2.2. Bivariate Analysis

Data analysis is aimed at answering research objectives and testing research hypotheses. For this purpose, the statistical test used is the chi- square test (X2) using a 2 x 2 table with an error rate of α = 0.05.

3. Result

3.1. Respondent Characteristics

3.1.1. Age

Table 1: Distribution of Respondents by Age in the working area of the Gintu Health Center

Age	Amount (n)	Percentage (%)
<20 years	6	10.3
20-35 years	43	74.1
> 35 years	9	15.5
Total	**58**	**100.0**

Source: Primary Data 2019

Pursuant Table 1 shows that the majority of respondents aged 20-35 years as many as 43 respondents (74,1 %).

3.1.2. Education

Table 2: Distribution of Respondents by Education in the working area of the Gintu Health Center

Education	Amount (n)	Percentage (%)
primary school	9	15.5
Junior High	5	8.6
High school	27	46.6
College	1 7	29.3
Total	**58**	**100.0**

Source: Primary Data 2019

Based on table 2 shows that the majority of respondents have high school education as many as 27 respondents (46.6%) .

Table 3: Distribution of Respondents by Occupation in the working area of the Gintu Health Center

Profession	Amount (n)	Percentage (%)
Housewife	35	60.3
entrepreneur	13	22.4
Civil servants	10	17.2
Total	**58**	**100.0**

Source: Primary Data 2019

3.1.3. Profession

Based on Table 3 shows that the majority of respondents are air work as a Housewife (IRT) as many as 35 respondents (60.3 %).

3.2. Univariate Analysis

3.2.1. Immunization Completeness

Table 4: Distribution of Completeness of Immunization Frequency in the Region Gintu Health Center Work

Immunization Completeness	Amount (n)	Percentage (%)
Complete	33	56.9
Incomplete	25	43.1
Total	**58**	**100.0**

Source: Primary Data 2019

Based on table 4 above shows that the complete category of Immunization Completeness of respondents was 33 respondents with a percentage (56.9%), and incomplete categories were 25 respondents with a percentage (43.1%).

3.2.2. ARD incidence

Table 5: Distribution of ARI Occurrences in the Work Area Gintu Health Center

ARD incidence	Amount (n)	Percentage (%)
ARI	30	51.7
Not ARI	28	48.3
Total	**58**	**100.0**

Source: Primary Data 2019

Based on table 5 above, it shows that the frequency of ARIs experiencing ARI was 30 respondents (51.7%), and 28 respondents (48.3%) did not experience ARI.

3.3. Bivariate Analysis

TABLE 6: Relationship of Completeness of Immunization with the Incidence of ARI in Toddlers in the working area of the Gintu Health Center

Immunization Completeness	ARD incidence				Total		P Value	OR CI-95%
	ARI		Not ARI					
	F	%	F	%	F	%	0,000	0.071 (0.019-0,266)
Complete	9	15.5	24	41.4	33	56.9		
Incomplete	21	36.2	4	6.9	25	43.1		
Total	30	51.7	28	48.3	58	100		

Source: Primary Data 2019

Based on table 6 above, 58 respondents showed complete data on the complete category of immunization with ARI as many as 9 respondents (15.5%), 24 respondents (41.4%) had complete complete category immunization completeness who did not experience ARI (41.4%), while the completeness of immunization was incomplete. 21 respondents (36.2%) experienced ARI, and 4 respondents (6.9%) had incomplete immunization categories who did not experience ARI. From the results of the chi-square test, it was found that P value: 0.000 (<0.05), where it can be concluded that there is a relationship between completeness of immunization and the incidence of ARI in children under five in the working area of the Gintu Health Center, which is seen from the Odds Ratio (OR) value, the relationship is 0.071. times the relationship between completeness of immunization and the incidence of ARI in children under five, the two variables are associated between 0.019 times to 0.266 times.

4. Discussion

Based on the results of the study, it shows that the complete category of Immunization Completeness of respondents was 33 respondents with a percentage (56.9%), and incomplete categories were 25 respondents with a percentage (43.1%).

This research is in line with research conducted by Desiyana (2017) based on the results of research conducted in the work area of Puskesmas Sawit Seberang, Langkat Regency on completeness of under-five immunization, it is seen that there are still 18 toddlers who do not get complete immunization (20.0%) of 90 toddlers, while 72 under five (80.0%) had received complete immunization. Immunization is a way to actively increase a person's immunity and aims to prevent infectious diseases. Not full immunization toddler cause weak immunity, making it easy to ARI [25].

Based on the asumptions of researchers that lack accessory immunization can lead to morbidity, disability, and death of a toddler. Providing immunization to toddlers so that they are complete, counseling should be held in the village, providing information to the wider community, such as providing information services for the community, government programs to mobilize health workers to carry out immunizations regularly. It is hoped that toddlers really get complete immunizations and are free from various diseases caused by incomplete immunizations, can reduce mortality in under-five and can improve the quality of health in toddlers. Immunization completeness of the majority of respondents in the complete category because the respondents in the working area of the Gintu Health Center are quite active in participating in the Posiandu, the majority of respondents are aware of the importance of bringing their posiandu children, it seems that the respondent's knowledge is quite good about immunization because most of the respondents have high school education.

4.1. ARI incidence

Based on the results of the study showed that the frequency of ARI incidence with ARI was 30 respondents (51.7%), and 28 respondents (48.3%) did not experience ARI.This research is in line with research conducted by [45] showing that out of 71 respondents, many children of the respondents who experienced ARI incidents, namely 46 respondents (64.8%). This research is also in line with the research conducted by [6] that the results obtained from 137 toddlers with ARI incidence with ARI, there were 50 children under five (36.5%) and 87 children who did not suffer from ARI (63.5%). The incidence of ARIs known to the public is not yet fully understood and understood, this is due to the lack of information and knowledge about ARDs. Signs of ARI that often occur can have an impact on the declining health condition of children under five. This declining health condition of toddlers if they do not get immediate help can result in the death of children under five. To reduce mortality in children under five due to the incidence of ARI can be overcome by early detection of signs and symptoms of ARI, good environmental conditions, responsive mothers with under-five health conditions and government policy programs to combat the incidence of ARI . The incidence of ARIs that are handled quickly is expected to reduce the mortality rate, improve the health of children under five, and reduce the incidence of ARI. This must be the concern of parents, health workers who routinely hold outreach to the community and the government's concern for the health of toddlers so that they are free from ARI.

Based on the assumption of ARI disease researchers will attack if the immune system (immunity) decreases. Infants and children under five years of age are groups that have an immune system that is still very vulnerable to various diseases including ARI, both pneumonia and non-pneumonia groups. ARI in infants in Puskesmas Gintu mostly experienced ARI because the respondents said that now their children have a cough-stone, nasal congestion, runny nose and mengelurkan no toddler has a fever.

4.2. Bivariate Analysis

Based on the results of the study of 58 respondents 58 showed complete data on the complete category of immunization with ARI as many as 9 respondents (15.5%), the completeness of complete immunization categories who did not experience ARI were 24 respondents (41.4%), while the completeness of immunization was in the incomplete category. 21 respondents (36.2%) experienced ARI, and 4 respondents (6.9%) had incomplete immunization categories who did not experience ARI. From the results of the *chi-square* test *, it was* found that P value: 0.000 (<0.05) , where it can be concluded that there is a relationship between completeness of immunization and the incidence of ARI in children under five in the working area of the Gintu Health Center, which is seen from the Odds Ratio (OR) value, the relationship is 0.071. times the relationship between completeness of immunization and the incidence of ARI in children under five, the two variables are associated between 0.019 times to 0.266 times.

This research is also in line with research conducted by Desiyana (2017), based on the results of research that has been conducted, statistical results are obtained using the Chi-Square test of p> 0.05, meaning that there is a significant relationship between completeness of immunization and the incidence of ARI in children under five in the Work Area. Puskesmas Sawit Seberang Langkat District. Based on the results of the table, it was found that the proportion of children under five who experienced ARI incidence with incomplete immunization status was 77.2% and children under five with complete immunization status was 41.7%.

These results are similar to research conducted by Betty (2014) at the Teladan Public Health Center in Medan, the study found that the proportion of children under five suffering from ARI with incomplete immunization was 67.9%, with the chi-Square test results obtained p <0.05 so that It was concluded that there was a significant relationship between immunization status and the incidence of ARI in children under five at the Teladan Public Health Center in Medan.

Another similar study was also studied by Exodus (2016) in the Work Area of the Binjai Village Health Center, Medan City. In analyzing the data on the relationship between immunization status and the incidence of ARI, the spearmen correlation coefficient value or r = -0.407 was obtained with p = 0.000. So the results of this study indicate that there is a significant relationship between the status of completeness of immunization with the incidence of acute respiratory infections (ISPA) in the working area of the Binjai Village Health Center. This relationship is interpreted based on the Spearmen correlation test with the results of P value = 0.000 (p <0.05) and the value of r = -0.842. The value of r shows a strong relationship and has a negative pattern, meaning that the more complete the immunization status, the smaller the incidence of acute respiratory tract infections.

Acute respiratory infection (ARI) is a disease that can be prevented by immunization. One of the factors causing ARI is the immunization status of children under five. ARI comes from a type of disease that develops from preventable diseases such as diphtheria, pertussis, and measles, so an increase in immunization coverage will play a major role in efforts to eradicate ARI (Anik, 2010 in Desiyana , 2017). The method that has proven to be the most effective at this time is by giving measles immunization, giving complete immunization before the child reaches the age of 1 year, the child will be protected from some of the most important causes of respiratory infections including whooping cough, diphtheria, tuberculosis and measles. If you have diphtheria, pertussis, if you don't get adequate help, it will be fatal. With complete immunization, it can prevent the death of ARIs caused by complications of measles and pertussis [10].

Based on the assumption of researchers that the status of incomplete immunization can be a risk factor for the incidence of ARI in children under five in the working area of the Gintu Health Center, and this research shows that under five with complete immunization also experience ARDs, this is because toddlers with complete immunization status have poor nutritional status, low socioeconomic conditions, not getting exclusive breastfeeding, bad environmental conditions that cause children with complete immunization to suffer from ARI and poor maternal care for toddlers which allows toddlers to experience acute respiratory infections (ISPA). Based on the results of the study, it can be seen that the status of immunization completeness has a very big role in maintaining the health of the toddler's body in preventing infectious diseases, especially ARI in toddlers. So it can be concluded that the completeness of immunization affects the incidence of ARI in toddlers.

5. Conclusion

Based on the results of research from 58 respondents the conclusions obtained are as follows: from the chi-square test results obtained P value: 0.000 <0.05, which can be concluded that there is a relationship between completeness of immunization with the incidence of ARI in children under five in the working area of Puskesmas Gintu. Where seen from the value of the Odds Ratio (OR), the relationship between 0.071 times is associated with the completeness of immunization and the incidence of ARI in children under five, both variables are associated between 0.019 times to 0.266 times.Suggestion

5.1. For the Gintu Health Center

The availability of quality health service facilities at costs that are easily accessible to the community and provide health services by professionals regarding the needs of patients, especially those with ARDs and it is hoped that health workers will be able to increase maternal mutation in completing immunization for toddlers so that the incidence of ARI in the working area of Gintu Health Center can be reduced.

5.2. For Further Researchers

Further researchers are expected to continue this research with different methods and variables so that the factors associated with the incidence of ARI in toddlers are better known. This is a research study, especially on the factors associated with the incidence of acute respiratory infections in infants and in the future, it is not possible to meet quantitative methods but also quantitative methods. For the purposes of obtaining deep information using mix methods. This view is for more in-depth shatles associated with ARI in infants.

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