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The Relationship of Immunization Status with the Incident of Acute Respiratory Infections in Toddler in the Gunungsari Cirebon Health Center Area

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KEYWORDS

Immunization status; Acute Respiratory; Infection (ARI)

ABSTRACT

Acute Respiratory Infection (ARI) is an acute infection of the respiratory tract caused by microorganisms in the respiratory tract. ARI is often encountered and is the leading cause of death in infants. Immunization is one of the efforts that can reduce the risk of ARI. To determine the relationship between immunization status and the incidence of ARI in infants in the Gunungsari Cirebon Health Center area. This study was an observational study with a cross-sectional design. The sample size was 99, using a consecutive sampling technique. Statistical tests used the Chi-square test. Data collection used medical records to see the diagnosis of ARI and the KMS book to see the immunization status. A total of (57.6%) of the 99 infants were diagnosed with ARI, and (82.8%) of the infants had completed basic ARI immunization. The results of the Chi-square test showed a p-value of 0.083. There is no relationship between immunization status and the incidence of ARI in infants in the Gunungsari Cirebon Health Center area, however, immunization can prevent most deadly influenza-related diseases, which is a strong predictor of death in infants.

INTRODUCTION

ISPA disease, commonly referred to as Acute Respiratory Tract Infection (ARTI), is an acute infection caused by microorganisms in the respiratory tract, ranging from the nose, larynx, trachea, bronchi, and bronchioles to the lungs (Rahayuningrum, 2021). ISPA is frequently encountered and is one of the leading causes of death in children under five years of age. Infants and children under five are a vulnerable group because their immune systems are not yet fully developed like those of adults, making them more susceptible to contracting diseases from adults. Several factors commonly contribute to ISPA, including air pollution, smoking habits inside the home or near toddlers, and the immunization status of toddlers, which can help prevent infectious diseases such as acute respiratory infections (ARI) (Lea et al., 2022; Gobel et al., 2021).

ISPA disease, commonly referred to as Acute Respiratory Tract Infection (ARTI), is an acute infection caused by microorganisms in the respiratory tract, ranging from the nose, larynx, trachea, bronchi, and bronchioles to the lungs (Rahayuningrum, 2021). ISPA is frequently encountered and is one of the leading causes of death in children under five years of age (Anggraini et al., 2024; Hasanah & Singarimbun, 2025). Infants and children under five are a

vulnerable group because their immune systems are not yet fully developed like those of adults, making them more susceptible to contracting diseases from adults. Several factors commonly contribute to ISPA, including air pollution, smoking habits inside the home or near toddlers, and the immunization status of toddlers, which can help prevent infectious diseases such as acute respiratory infections (ARI) (Lea et al., 2022; Gobel et al., 2021).

Immunization is one of the key efforts to reduce the risk of ARI. Providing complete immunization can enhance an infant's immunity and protect against various serious diseases (Kementerian Kesehatan Republik Indonesia, 2022). Infants who do not receive complete immunization are at higher risk of developing various diseases, including vaccine-preventable diseases. On the other hand, toddlers with complete immunization status who contract ISPA are expected to experience less severe disease progression (Lea et al., 2022).

According to data from the Ministry of Health of the Republic of Indonesia, 92.7% of infants aged 0 to 11 months received complete basic immunization (Kementerian Kesehatan Republik Indonesia, 2022). In West Java, complete basic immunization coverage in 2020 was 82.26%. By type, coverage included 94.7% for HB0 immunization, 85.4% for BCG immunization, and 93.5% for DPT-HB3 immunization (Dinas Kesehatan Jawa Barat, 2020). According to the Cirebon City Health Office, complete basic immunization coverage in 2022 reached 84.4% (Dinas Kesehatan Kota Cirebon, 2022).

A previous study conducted by Billa Salfa in 2022, entitled Factors Related to the Incidence of ISPA in Toddlers at the Cikuya Health Center, Tangerang Regency in 2022, reported a significant relationship between immunization status and the incidence of ISPA in toddlers (Utami et al., 2023).

The research gap addressed by this study lies in the lack of recent data specifically examining the relationship between immunization status and ARI incidence in the Gunungsari Health Center area of Cirebon City. While national and provincial data provide a broad overview, local variations in healthcare access, environmental factors, and parental practices necessitate localized investigation. Preliminary data from the Gunungsari Health Center indicate a notable increase in ARI cases, from 385 cases in 2022 to 508 cases in 2023, suggesting a worsening trend that requires immediate attention.

The urgency of this research is underscored by the increasing number of ARI cases at the Gunungsari Health Center, where ARI was the most frequently reported disease in November 2023, with 219 cases. Without a clear understanding of local contributing factors, including immunization status, effective preventive interventions cannot be properly targeted. The novelty of this study lies in its specific focus on the Gunungsari Cirebon Health Center area, which has unique demographic and environmental characteristics that have not been previously examined in relation to this issue. This research provides contemporary, localized data that can inform health policy and practice in the region.

The Gunungsari Health Center is in central Cirebon and has a relatively high ISPA incidence rate. In 2022, the center recorded 385 cases of ISPA in toddlers. In 2023, this number increased to 508 cases, indicating a rising trend in ISPA incidence among toddlers at the facility. According to the top 10 diseases report from the Gunungsari Health Center in November 2023,

ISPA in both toddlers and adults ranked highest, with a total of 219 cases.

Based on the background described above, the researcher is interested in conducting a study on the relationship between immunization status and the incidence of acute respiratory tract infections in toddlers in the Gunungsari Cirebon Health Center area. As outlined in the background, this study seeks to answer the following question: What is the relationship between immunization status and the incidence of acute respiratory infections in toddlers in the Gunungsari Cirebon Health Center area? The objective of this study is to determine whether a relationship exists between immunization status and the incidence of acute respiratory infections in toddlers in the Gunungsari Cirebon Health Center area.

METHOD

The scope of this research includes Child Health Sciences and Public Health Sciences. This research was carried out in June-July 2024 at the Gunungsari Health Center, Cirebon City. This study was observational and analytical, including a study with a cross sectional design to assess whether there is a relationship between immunization status and the incidence of ISPA in toddlers. Data collection was carried out once at a time and no intervention was carried out on the research subjects.

The target population in this study is all mothers who have toddlers aged 1-5 years in Cirebon City. The affordable population in this study is all mothers who have toddlers aged 1-5 years in the Gunungsari Health Center area, Cirebon City.

1. Mothers who have toddlers with an age range of 1-5 years
2. Mothers with toddlers who come to the Gunungsari Health Center for treatment

Exclusion Criteria

1. Mothers with toddlers who are malnourished or stunted
2. Mothers with toddlers who have a history of low birth weight

This study uses the Consecutive Sampling technique, How to determine the size of the sample with the slovin formula as follows:

$$n = \frac{N}{1 + N(e)^2}$$

Description:

n = Sample size/number of respondents N = Population size

e = Percentage of allowability in the accuracy of sampling errors that can still be tolerated; e= 0.1.

In this study, the technique that used to take samples uses the Slovin formula as follows:

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{360}{1 + 360\ (0.1)^2}$$

$$n = 99$$

Description:

n = Sample size/number of respondents N = Population size

e = Percentage of allowability in the accuracy of sampling errors that can still be tolerated; e= 0.1

Research variables are the object of research or what is of concern in research. The variables used in this study are:

1. Independent Variable

   The independent variable in this study was immunization status.

2. Bound Variable (Dependent)

   The variable bound to this study is the incidence of ISPA.

Table 2. Operational Definition

No	Variable	Definition Operational	Tools Measure	Criteria	Scale Measure
1	Immunization Status	The completeness of basic immunization status in toddlers includes all types of basic immunizations related to ISPA, including: 1. BCG (1 time) 2. DPT (3 times) 3. HiB (3 times)	KMS Books	• Complete: Basic immunization of ISPA fulfilled • Incomplete: Basic immunization of ISPA no fulfilled	Nominal

2	ISPA Incident	Incidence of acute respiratory tract infection is a toddler who was diagnosed with an acute respiratory tract infection at the Gunungsari health center Cirebon.	Medical Record Data	• Patients diagnosed with ISPA : Yes • Patients who are not diagnosed with ISPA : No	Nominal

The type of data taken in this study is secondary data. The instruments used in the study were medical record data to assess the incidence of ISPA and KMS book to assess immunization status.

Data collection was carried out at the Gunungsari Health Center, Cirebon City, on mothers of toddlers aged 1-5 years who came to the Gunungsari Health Center who met the inclusion and exclusion criteria, including basic immunization status in toddlers aged 1-5 years with the incidence of ISPA. The procedure carried out in this study is carried out in 3 stages, including:

a. Preparation stage
    1) Taking care of permits and coordinating with the heads of relevant institutions
    2) Setting a schedule of research activities
b. Implementation stage
    1) The researcher waited at the health center polyclinic until a toddler patient was found who met the inclusion and exclusion criteria.
    2) Record and confirm the completeness of immunization status with KMS.

c. Completion stage

At the completion stage, data processing of research results is carried out and research reports are compiled.

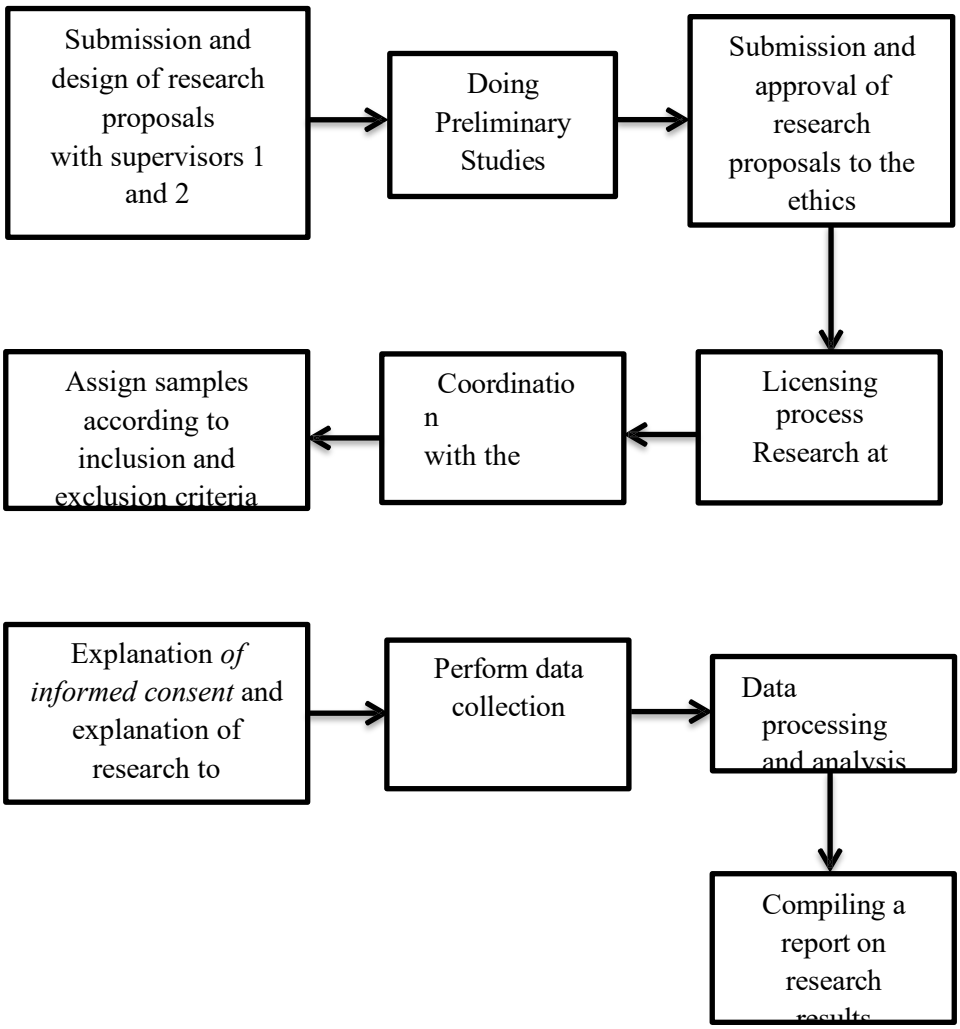

Figure 1 Research Flow

Data Analysis

1. Univariate analysis aims to describe the characteristics of each independent variable, namely immunization status and bound variable, namely the incidence of ISPA.
2. Bivariate analysis was used to determine the relationship between the free variable, namely immunization status, and the bound variable, namely the incidence of ISPA. This bivariate analysis was carried out by the Chi-square test, because it used categorical data, namely independent variables and nominal-scale bound variables.

Research Ethics

This research has been approved by the Ethics Committee of the Faculty of Medicine, Swadaya Gunung Jati University with number No.88/EC/FKUGJ/VI/2024. Have received a letter of approval from the dean to conduct research and an application for a research permit

approved by the Cirebon City National and Political Unity Agency (KESBANGPOL).

RESULT AND DISCUSSION

Demographic Characteristics of Respondents

The demographic characteristics of the respondents in this study were based on the age and gender of the toddlers.

1. Gender

   The characteristics of gender in the Gunungsari Health Center in Cirebon City are presented in table 3 as follows:

Table 3 Gender Characteristics

Gender	Frequency	%
Male	50	50,5
Women	49	49,5
Total	99	100,0

Based on Table 2, it shows the description of gender in toddlers at the Gunungsari Puslesmas, Cirebon City. From Table 3, it can be seen that of the 99 respondents used as a research sample, as many as 50 toddlers (50.5%) were boys and as many as 49 toddlers (49.5%) were women.

2. Age

   The gender characteristics at the Gunungsari Health Center in Cirebon City are presented in table 4 as follows:

Table 4 Characteristics of Toddler Age

Toddler Age	Frequency	%
1 Year	32	32,3
2 Year	21	21,2
3 Year	20	20,2
4 Year	22	22,3
5 Year	4	4,0
Total	99	100,0

Based on Table 4, it shows the Age Description of toddlers at the Gunungsari Health Center, Cirebon City. From Table 4, it can be seen that of the 99 respondents used as a research sample, as many as 32 toddlers (32.3%) were toddlers with the age of 1 year, as

many as 21 toddlers (21.2%) were toddlers with the age of 2 years, as many as 20 toddlers (20.2%) were toddlers with the age of 3 years and as many as 4 toddlers (4.0%) were toddlers with the age of 5 years.

Univariate Analysis

Descriptive statistical analysis is a statistical tool used to describe the variables contained in the study. Analysis was carried out on 99 samples that were the subject of the study with the aim of determining the relationship between immunization status and the incidence of acute respiratory infections in toddlers in the Gunungsari Cirebon Health Center area.

1. Immunization Status

Table 5. Characteristics of Immunization Status

Immunization Status	Frequency	%
Complete	82	82,8
Incomplete	17	17,2
Total	99	100,0

Based on Table 5, it shows an overview of immunization status in toddlers at the Gunungsari Health Center, Cirebon City. From Table 5, it can be seen that of the 99 respondents who were used as research samples, as many as 82 toddlers (82.8%) have been fulfilled for basic immunization of BCG, DPT-1, DPT-2, DPT-3, Hib-1, Hib-2, and Hib-3. There are 17 toddlers (17.2%) who have not been fulfilled for basic immunization of BCG, DPT-1, DPT-2, DPT-3, Hib-1, Hib-2, Hib-3.

2. ISPA

Table 6. ISPA Event Distribution

ISPA Incident	Frequency	%
ISPA	57	57,6
No ISPA	42	42.4
Total	99	100,0

Based on Table 6, it shows an overview of the incidence of ISPA in toddlers at the Gunungsari Puslesmas, Cirebon City. From Table 6, it can be seen that of the 99 respondents used as a research sample, as many as 57 toddlers (57.6%) have been diagnosed with ISPA, and there are 42 toddlers (42.4%) who have not been diagnosed with ARI.

Bivariate Analysis

1. The Relationship between Immunization Status and the Incidence of ISPA

The analysis of the relationship between immunization status and the incidence of ISPA was carried out using the Chi-Square test. Test criteria when p value < level of significance there is a relationship between the two variables, and if p value > level of significance then there is no relationship between the two variables. The results of the analysis of the relationship between immunization status and the incidence of ISPA are in the following table:

Table 7. The Relationship between Immunization Status and the Incidence of ISPA

Immunization Status	Diagnosis						p value	PR (CI 95%)
	No ISPA		ISPA		Total			
	n	%	n	%	n	%		
Complete	38	38,4	44	44,4	82	82,8	0.083	0,508
No	4	4,1	13	13,1	17	17,2		(0,209-
Complete								1,234)
Total	**42**	**42,5**	**57**	**57,5**	**99**	**100,0**		

Based on the results of the analysis in Table 7, it shows an overview of the relationship between Immunization Status and the incidence of ISPA in toddlers at the Gunungsari Health Center, Cirebon City. From Table 7, it can be seen that the results of the chi-square statistical test obtained a P value = 0.083 > 0.05. These results show that there is no significant effect on immunization status on the incidence of ISPA in toddlers at the Gunungsari health center, Cirebon City. The results also show that toddlers who are incomplete immunized will increase the risk of the incidence of ISPA by 0.508 times greater than those who are fully immunized. (p = 0.083 PR = 0.508 CI = 0.209-1.234).

Immunization Status

This study shows that the immunization status of toddlers at the Gunungsari Health Center in Cirebon City in Table 3 can be found that of the 99 respondents under five who were used as a research sample, the majority of basic immunizations have been fulfilled BCG, DPT-1, DPT-2, DPT-3, Hib-1, Hib-2, Hib-3. A total of 82 respondents under five (82.8%), while the remaining 17 respondents under five (17.2%) still have not met the basic immunizations of BCG, DPT-1, DPT-2, DPT-3, Hib-1, Hib-2, Hib-3. These results are descriptive results that can be used to describe the prevalence of immunization status at the Gunungsari Health Center, Cirebon City. In theory, immunization is an effort made by

Providing immunity to toddlers so as to avoid several types of infectious diseases and immunization will stimulate the formation of antibodies in the body. One of the immunizations

can prevent various AKI diseases. To reduce factors that increase the mortality of ARI, complete immunization is sought, especially BCG, DPT-1, DPT-2, DPT-3, Hib-1, Hib-2, and Hib-3 (Kementerian Kesehatan Republik, 2014).

Similar findings were also obtained in other studies regarding the immunization status in toddlers, one of which was in Arius' research in 2022 at the Karubaga Health Center, Tolikara Regency, aiming to analyze factors that affect the incidence of acute respiratory infections, with the results of the study showing that of the 66 respondents under five who became respondents, it was found that there were 38 toddlers (57.6%) with complete immunization status, Meanwhile, the remaining 28 toddlers (42.4%) with incomplete immunization status (Togodly, 2022).

This research is also in line with research conducted by Weni Seprilia in 2022 at the Depati VII Health Center, Kerinci Regency, aiming to find out the factors related to the symptoms of ISPA in toddlers, with the results of the study showing that of the 85 respondents under five, it was found that there were 57 toddlers (67.1%) with complete immunization status, while the remaining 28 toddlers (32.9%) had incomplete immunization status (Togodly, 2022).

Similar results were also obtained in Indrayani's research in 2022 in Cikeusal Village, Cimahi District, Kuningan Regency, aiming to find out the relationship between age, immunization status and smoking behavior with the incidence of ISPA in toddlers, with the results of the study showing that of 227 respondents under five who became respondents, it was found that there were 216 toddlers (95.2%) with complete immunization status, while the remaining 11 toddlers (4.8%) had incomplete immunization status (Indrayani et al., 2022).

This result is in line with other studies on the immunization status in toddlers, one of which is in Eva Ellya's research in 2023 at the Mandala Health Center, Medan Tembung District, aiming to analyze factors related to the incidence of acute respiratory tract infections in toddlers, with the results of the study showing that of the 77 respondents under five who became respondents, it was found that there were 50 toddlers (64.9%) with complete immunization status, Meanwhile, the remaining 27 toddlers (35.1%) with incomplete immunization status (Sibagariang et al., 2023).

ISPA Incident

This study shows that of the 99 respondents used as a research sample in Table 4, there were 57 respondents under five (57.6%) diagnosed with ISPA, and as many as 42 respondents under five (42.4%) were not diagnosed with ISPA. These results are descriptive results that can be used to describe the prevalence of ISPA in the Gunungsari Health Center, Cirebon City. Acute Respiratory Tract Infection (ARI) is an upper or lower respiratory tract disease that can cause various diseases, ranging from asymptomatic or mild infections to severe and deadly diseases, depending on the pathogen that causes it, environmental factors and host factors. ISPA is a disease that often occurs in children, because the child's immune system is still low (Marcdan et al., 2021).

Similar findings were also obtained in other studies regarding the immunization status in toddlers, one of which was in Arius' research in 2022 at the Karubaga Health Center, Tolikara Regency, aiming to analyze factors that affect the incidence of acute respiratory tract infections,

with the results of the study showing that of the 66 respondents under five who became respondents, it was found that there were 51 toddlers (77.3%) diagnosed with ISPA, Meanwhile, the remaining 15 were under five (22.7%) with no diagnosis of ISPA (Togodly, 2022).

Similar results were also obtained in Indrayani's research in 2022 in Cikeusal Village, Cimahi District, Kuningan Regency, aiming to find out the relationship between age, immunization status and smoking behavior with the incidence of ISPA in toddlers, with the results of the study showing that of 227 respondents under five who became respondents, it was found that there were 186 toddlers (81.9%) diagnosed with ISPA, while the remaining 41 toddlers (18.1%) were not diagnosed with ISPA (Togodly, 2022).

This result is in line with other studies on the immunization status in toddlers, one of which is in Eva Ellya's research in 2023 at the Mandala Health Center, Medan Tembung District, aiming to analyze factors related to the incidence of acute respiratory tract infections in toddlers, with the results of the study showing that of the 77 respondents under five who became respondents, it was found that there were 43 toddlers (55.8%) diagnosed with ISPA, Meanwhile, the remaining 34 were toddlers (44.2%) who were not diagnosed with ISPA.(21)

The results of the study showed that the majority of toddlers diagnosed with ISPA were male. The mechanism regarding the relationship between sex and the incidence of ISPA can be caused by factors that boys tend to be more active compared to girls, allowing boys to be exposed to the causative agent of ISPA more often. In addition, boys are more susceptible to ISPA because boys are more active in activities so it is easy to get tired and tend to have a decreased immune system, compared to girls (Indrayani et al., 2022).

Based on the results of research on the age characteristics of toddlers who come to the Gunungsari Health Center poly, it shows that the majority occurs in 1-year-old toddlers, namely 32 toddlers (32.3%). There are several factors that cause 1-year-old toddlers to be susceptible to disease, including the immune system in toddlers which is still not strong enough to face virus attacks or germs from outside,

The environment also contributes to the many complaints of toddlers who are often sick, toddlers are more susceptible to the effects of weather changes than adults, parents who smoke in the home environment have the potential to make toddlers often sick, these diseases are mainly related to respiration, such as asthma and acute respiratory infections. Continuous exposure to cigarette smoke can lead to more serious diseases in toddlers (Sibagariang et al., 2023; Widyawati et al., 2020).

The Relationship between Immunization Status and the Incidence of ISPA

This study found that in toddlers with complete immunization, the majority experienced the incidence of ARI, namely 44 toddlers out of 99 respondents, and toddlers with incomplete immunization and experienced the incidence of ARI, only 13 of the 99 respondents, while for toddlers who had complete immunization status and were not diagnosed with ARI, as many as 38 toddlers out of 99 respondents, and for toddlers with incomplete immunization status and not diagnosed with ISPA as many as 4 toddlers out of 99 respondents. The results of the analysis of the chi-square statistical test obtained a p-value of 0.083 ($p = > 0.05$), then H0 was accepted

and H1 was rejected, so it can be concluded that there is no significant relationship between immunization status and the incidence of Acute Respiratory Infection (ARI) in toddlers at the Gunungsari Health Center, Cirebon City.

Similar findings were also obtained in other studies regarding the immunization status in toddlers, one of which was in Arius' research in 2022 at the Karubaga Health Center, Tolikara Regency, aiming to analyze factors that affect the incidence of acute respiratory infections, with the results of the study showing that of the 66 respondents under five who became respondents, it was found that there were 38 toddlers (57.6%) with complete immunization status, While the remaining 28 toddlers (42.4%) with incomplete immunization status, Conclusion of the results of the test on the relationship between immunization status and the incidence of acute respiratory tract infections using a chi-square showed the result of a value of p = 0.608 (p = > 0.05), indicating that there was no significant relationship between immunization and the incidence of ISPA in toddlers at the Karubaga Health Center, Tolikara Regency (Indrayani et al., 2022).

This study is also in line with research conducted by Indrayani in 2022 in Cikeusal Village, Cimahi District, Kuningan Regency, aiming to determine the relationship between age, immunization status and smoking behavior with the incidence of ISPA in toddlers, with the results of the study showing that from 227 respondents under five who became respondents, it was found that there were 216 toddlers (95.2%) with complete immunization status, While the remaining 11 toddlers (4.8%) with incomplete immunization status, Conclusion of the results of the test on the relationship between immunization status and the incidence of acute respiratory tract infections using the chi-square statistical test showed the result of the value p = 0.423 (p= > 0.05), showing that there was no significant relationship between immunization and the incidence of ISPA in toddlers in Cikeusal Village, Cimahi District, Kuningan Regency (Sibagariang et al., 2023).

This is in accordance with previous research conducted by Eva Ellya in 2023 at the Mandala Health Center, Medan Tembung District, aiming to analyze factors related to the incidence of acute respiratory infections in toddlers, The results of the distribution regarding toddlers with complete immunization status were 50 toddlers (64.9%), toddlers with incomplete immunization status as many as 27 toddlers (35.1%), The conclusion of the results of the relationship test between immunization status and the incidence of acute respiratory tract infections using the chi-square statistical test showed a value of p = 0.970 (p = > 0.05), showing that there was no significant relationship between immunization and the incidence of ISPA in toddlers at the Mandala Health Center in Medan (Sibagariang et al., 2023).

In the results of this study, there is no relationship between immunization status and the incidence of acute respiratory infections, but immunization is important to maintain the immunity of toddlers. Toddlers can get immunizations easily through posyandu (Ariani & Ekawati, 2021).

In a study conducted by Margaret M. Newhams and Natasha B. Halasa from Oxford University entitled "Vaccine Effectiveness Against Life-Threatening Influenza Illness in US Children" that immunization can prevent most deadly influenza-related diseases which are strong predictors of mortality. Immunization can reduce the severity of influenza infections and

is very effective in preventing life-threatening influenza in children (Olson et al., 2022).

Efforts that can be made to increase immunization coverage are to remind parents of education or counseling on a regular basis, especially mothers of toddlers about the importance of complete immunization to prevent the occurrence of certain diseases including ISPA in toddlers as well as counseling about the right time for immunization, socialization about the importance of immunization and its impact if you do not get complete immunization. Even so, there are several other risk factors that can cause acute respiratory infections in toddlers, such as exclusive breastfeeding for at least 6 months has a very strong association with the occurrence of ISPA. This is due to the presence of colostrum in breast milk which contains many antibodies, including BALT, which creates antibodies to respiratory tract infections and white blood cells, as well as vitamin A which can provide protection against infections and allergies, the habit of smoking indoors which has great potential for toddlers suffering from ISPA such as family members usually smoke indoors when relaxing with family so that exposure to cigarette smoke is high when children are in the house, higher, and babies at home are at higher risk,

Babies with nutritional status are more or less susceptible to inflammatory diseases, moreover the attacks last longer than children with normal nutrition (Ariani & Ekawati, 2021). Various efforts that can be made related to nutritional status and ISPA in toddlers are by holding health promotion which includes counseling, health education and an overview of nutritional status and the incidence of ISPA in infants. The way to prevent ISPA is to ensure that the child has a good nutritional status, work on the child's immunity, maintain personal and environmental hygiene, prevent children from contact with people with ISPA and immediately seek treatment if there are indications of ARI (Afriani, 2020).

CONCLUSION

Based on the statistical analysis and discussion, most toddlers at the Gunungsari Health Center in Cirebon City had received immunization, with 82 (82.8%) categorized as fully immunized and 17 (17.2%) not fully immunized, while 57 toddlers (57.6%) were diagnosed with acute respiratory infection (ARI) and 42 (42.4%) were not. The chi-square test showed no significant relationship between immunization status and ARI incidence ($p = 0.083$; $p > 0.05$), indicating that immunization status alone may not be a determining factor in ARI occurrence among toddlers in this setting. These findings highlight the likelihood that other factors—such as environmental conditions, nutritional status, housing density, and exposure to smoke—play a more substantial role, suggesting that future research should incorporate a broader range of variables and potentially use longitudinal or multivariate approaches to better understand the determinants of ARI in this population.

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