TAHUN 2024 *[MANUJU: MALAHAYATI NURSING JOURNAL, ISSN CETAK: 2655-2728 ISSN ONLINE: 2655-4712, VOLUME 6 NOMOR 12 TAHUN 2024] HAL 4992-5008*

THE RELATIONSHIP BETWEEN INTRINSIC, EXTRINSIC FACTORS, AND SOCIO ECONOMIC STATUS WITH THE LEVEL OF PNEUMONIA AMONG TODDLERS AT PAAL V HEALTH CENTER, JAMBI CITY

Dela Lupita Sari[1*], Rumita Ena Sari[2], Hubaybah[3]

[1-3]Faculty of Medicine and Health Sciences, Jambi University

Email Korespondensi: delalup7@gmail.com

Disubmit: 16 Mei 2024 Diterima: 20 November 2024 Diterbitkan: 01 Desember 2024
Doi: https://doi.org/10.33024/mnj.v6i12.15237

ABSTRACT

Pneumonia is the most significant trigger of infections leading to death in children globally. Every year, an estimated 921,000 children under the age of 5 die due to pneumonia. This study aims to determine the relationship between intrinsic, extrinsic, and socioeconomic factors with the level of pneumonia in toddlers at the Paal V Community Health Center in Jambi City. This study uses an analytical quantitative research method, with a cross-sectional study design. The respondents in this study were 87 toddlers (aged 0-59 months). Data analysis was conducted using chi-square statistical analysis. The research results show the p-value of intrinsic factors, namely age PR 0.447 (p=0.339), gender PR 0.747 (p=0.668), Exclusive Breastfeeding PR 4.474 (p=0.000), low birth weight PR 2.364 (p=0.064), nutritional status PR 5.250 (p=0.000), history of Vitamin A supplementation PR = 3.897 (p=0.002), history of ARI PR 3.687 (p=0.003), history of asthma PR 5.647 (p=0.008), history of tuberculosis TB 2.514 (p=0.033). Extrinsic factors such as household crowding density PR 5.778 (p=0.000), smoking behavior indoors PR 0.763 (p=0.11). Socioeconomic factors such as mother's education PR 3.055 (p=0.025), mother's occupation PR 0.753 (p=0.036), and household income PR 2.703 (p=0.04). There is a relationship between Exclusive Breastfeeding, nutritional status, history of Vitamin A supplementation, history of ARI, history of asthma, history of Tuberculosis, household crowding density, mother's education, mother's occupation, and household income with the level of pneumonia in toddlers in Jambi City in 2023. Meanwhile, there is no relationship between age, gender, history of low birth weight, and indoor smoking behavior with the level of pneumonia in toddlers in Jambi City in 2023.

Keywords: Pneumonia, Toddlers, Intrinsic, Extrinsic, Socioeconomic

INTRODUCTION

Pneumonia is the most significant infectious trigger in the global cause of death in children. It is estimated that every year 921,000 children < 5 years old die from pneumonia. More than 95% of these deaths are found in low and middle income countries.

In the Ethiopian context, pneumonia is also a major factor in the level of morbidity and mortality in children under 5 years of age. Approximately 3,370,000 children suffer from pneumonia every year there, contributing around 20% of total deaths, and causing more than 40,000 children under the age of 5 to

die per year. This makes pneumonia the leading cause of death in the post-natal period (Andualem et al., 2020).

Based on the 2018 Riskesdas data, the highest number of pneumonia cases is experienced by children, especially in the age group under 5 years, with a figure of around 4.2%. Over the last 11 years, the scope of pneumonia findings in toddlers has shown quite significant fluctuations. Peak coverage occurred in 2016, reaching 65.3%. However, between 2015 and 2019, there was a significant change in the estimated number of cases, decreasing from 10% to 3.55%, leading to a surge in coverage in that period. A quite striking decline was seen in 2020-2021, mainly impacted by the COVID-19 pandemic. In 2019, visits with toddlers with coughs or difficulty breathing reached 7,047,834, but this figure fell to 4,972,553 in 2020, showing a decrease of 30%.

Pneumonia is the third cause of infant death in Jambi Province (Jambi, 2021). Reports of pneumonia cases in Jambi Province in 2011 were 4,963 cases, then increased again in 2012 to 5,972 cases with an increase in cases of 20.33% in just one year. In 2013, pneumonia cases tended to be constant from the previous year with 5,489 cases found with a coverage of 17.20%. Pneumonia cases fell in 2014 to 4,286 cases with coverage of 14.54%. In 2015 it increased to 6,873 cases and coverage of 21.19%. And in 2016 it increased significantly to 51.14% with 5,572 cases, decreased again in 2017 to 17% with 5,484 cases, then increased again in 2018 to 39.94% with 4,067 cases.

In 2019, pneumonia coverage in Jambi province reached 37.04%. With Jambi City occupying the second position as a contributor to the discovery of toddler pneumonia in Jambi Province, the coverage of the discovery of toddlers with pneumonia reached 56.17% in 2019 (Dinas Kesehatan Provinsi Jambi, 2019).

Research Question “What is the relationship between intrinsic, extrinsic, and socioeconomic factors and the level of pneumonia in toddlers at the Paal V Community Health Center in Jambi City?.

This study aims to determine the relationship between intrinsic (such as age, gender, nutritional status), extrinsic (such as exclusive breastfeeding, vitamin A administration, history of upper respiratory tract infections), and socioeconomic factors (such as income level, maternal education) with the level of pneumonia in toddlers at the Paal V Community Health Center in Jambi City.

LITERATURE REVIEW

Pneumonia, sometimes known as "The Forgotten Pandemic", is an acute infection that weakens the alveoli and causes lung inflammation. This is an infection that involves lung tissue (alveoli), and can be caused by fungi, viruses and bacteria (Kementrian Kesehatan RI, 2021).

Pneumonia often occurs along with an acute infection in the bronchi (often producing spots or spots on both lungs, including the airways and sacs), so essentially, pneumonia is an acute infection involving the alveoli tissue. In developing countries, pneumonia is often known as the biggest trigger for children's deaths and is often neglected in its treatment, even though it causes many deaths (Rina et al., 2020).

Even though it is the main cause of death, pneumonia is often ignored because of the low number of cases, the lack of specific

symptoms, and the lack of attention in its treatment. The classification of pneumonia is:

a. Severe pneumonia

In classification, the presence of lower chest wall retraction or an oxygen saturation level below 90 in toddlers is an important marker. Sufferers with this diagnosis require immediate treatment which involves administering antibiotics.

b. Mild pneumonia

Classification by examining the absence of indrawing of the lower chest wall (TDDK). In children aged 2 to 12 months, there is a respiratory rate of up to 50 times/minute. Meanwhile, in children 12 to 59 months, the respiratory rate is 40 times/minute or more.

Signs of this disease include chills, headache, fever, cough, phlegm production, and difficulty breathing. Pneumonia can be caused by various microorganisms such as viruses, bacteria and fungi. Transmission can occur through droplets produced when someone sneezes, coughs, or talks to other people directly.

Pathogenic microorganisms such as bacteria usually enter the lungs through the respiratory tract. Afterwards, they spread to the bronchioles and alveoli, triggering inflammation and causing the formation of edema fluid in and interstitial tissue (Hasanah et al., 2021).

The best way to reduce death rates due to pneumonia is through improving case management and ensuring the regular availability of appropriate antibiotics through primary care services by general practitioners. The next steps to reduce death rates from pneumonia involve providing referral care for children who suffer from severe ARI, require oxygen and require a second course of antibiotics, as well as more advanced clinical expertise.

The guidelines for handling ARI cases will provide standard guidelines for the treatment of this disease, which aims to minimize the use of antibiotics in cases of common colds and cough medicines that are not effective enough, namely (Titik Indarwati et al., 2023)

RESEARCH METHODOLOGY

This research uses quantitative analytical research methods with an observational research design through a cross-sectional study design, where sample measurements are simply carried out once at a time to identify correlations between dependent and independent variables. The research was conducted in the Paal V Community Health Center Working Area, Jambi City as the Community Health Center with the most pneumonia cases found in Jambi City in 2022.

The research was conducted in January-February 2024 with respondents in this study totaling 87 toddlers (aged 0-59 months) taken by total sampling who experienced levels of severe pneumonia and mild pneumonia at the Paal V Community Health Center, Jambi City. Data analysis through chi-square statistical analysis. The research has obtained a code of ethics from Jambi University, Faculty of Medicine and Health Sciences No.319/UNS21.8/PT.01.04/2024

RESEARCH RESULT

a. Univariate Analysis

Based on the results of research that has been carried out, the frequency distribution of

each variable on the symptoms of pneumonia in toddlers is:

Table1. Characteristics of Respondents regarding the Level of Pneumonia in Toddlers in Jambi City

Respondent Characterstic	n	Percentage (%)
Age		
0-2 years	19	21.8
>2 years	68	78.2
Sex		
Woman	45	51.7
Man	42	48.3
Exclusive Breastfeeding		
No	19	21.8
Yes	68	78.2
Low Birth Weight		
BBLR	22	25.3
Non BBLR	65	74.7
Nutritional Status		
Poor	24	27.6
Good	63	72.4
History of Vitamin A		
Poor	25	28.7
Good	62	71.3
History of Acure Resporatory Infection		
Yes	26	26.9
No	61	70.1
History of Asthma		
Yes	51	58.6
No	36	41.4
History of Tuberculosis		
Yes	21	24.1
No	66	75.9
Household Density		
Does Not Meet the Criteria	27	31
Meets the Criteria	60	69
Smooking Behavior in the House		
Yes	76	87.4
No	11	12.6
Mother's Educational Level		
Low	40	46
High	47	54
Mother's Occupation		
Not Working	73	83.9
Working	14	16.1
Household Income		
Low	37	425
High	50	57.5

Based on the research results in the table above, it is known that the dominant gender of toddlers is female, namely 45 respondents (51.7%), the majority of respondents are exclusively breastfed, namely 68 respondents (78.2%), not LBW, namely 65 respondents (74.7%), have good nutrition, namely 63 respondents (72.4%), had a history of giving good vitamin A, namely 62 respondents (71.3%), had no history of ISPA, namely 61 respondents (70.1%), had a history of asthma, namely 51 respondents (58.6%), had no history of tuberculosis, namely 66 respondents (75.9%). The majority of respondents have residential density environments that meet the requirements, namely 60 respondents (69%), who practice smoking at home, namely 76 respondents (87.4%). , behind higher education, namely 47 respondents (54%), not working, namely 73 respondents (83.9%), having a high household income, namely 50 respondents (57.5%).

b. Bivariate Analysis

Table 2. Results of Bivariate Analysis of the Relationship between Intrinsic, Extrinsic and Socio-Economic Factors with Childhood Pneumonia Levels in Jambi City

Variable	Pneumonia Level				Total		*P Value*	PR (95%CI)
	Severe		Mild					
	n	%	n	%	n	%		
Age								
0-2 years	2	10.5	17	89.5	19	100	0.339	0.447 (0.113-1.777)
>2 years	16	23.5	52	76.5	68	100		
Sex								
Woman	8	17.8	37	82.8	45	100	0.668	0.747 (0.326-1.711)
Man	10	23.8	32	76.2	42	100		
Exclusive Breastfeeding								
No	10	52.6	9	47.4	19	100	0.000	4.474 (2.054-9.742)
Yes	8	11.8	60	88.2	68	100		
Nutritional Status								
Poor	12	50	12	50	24	100	0.000	5.250 (2.222-12.405)
Good	6	9.5	57	90.5	63	100		
Low Birth Weight								
BBLR	8	36.4	14	63.6	22	100	0.064	2.364 (1.068-5.229)
Non BBLR	10	15.4	55	84.6	65	100		
History of Vitamin A								
Poor	11	44	14	56	25	100	0.002	3.897 (1.706-8.902
Good	7	11.3	55	88.7	62	100		
History of Acute Resporatory Infections								
Yes	11	42.3	15	57.5	26	100	0.003	3.687 (1.609-8.447)
No	7	11.5	54	88.5	61	100		
History of Asthma								
Yes	16	31.4	35	68.6	51	100	0.008	5.647 (1.383-23.054)

No	2	5.6	34	94.9	36	100		
History of Tuberculosis								
Yes	8	38.1	13	61.9	21	100	0.033	2.514 (1.142-5.537)
No	10	15.2	56	84.8	66	100		
Household Density								
Doesn't meet criteria	13	48.1	14	51.9	27	100	0.000	5.778 (2.289-14.585)
Meets the criteria	5	8.3	55	91.7	60	100		
Smooking Behavior in the House								
Yes	18	23.7	58	76.3	76	100	0.11	0.763 (0.673-0.865)
No	0	0	11	100	11	100		
Mother's Education Level								
Low	13	32.5	27	67.5	40	100	0.025	3.055 (1.192-7.831)
High	5	10.6	42	89.4	47	100		
Mother's Occupation								
Not working	18	24.7	55	75.3	73	100	0.036	0.753 (0.661-0.859)
Working	0	0	14	100	14	100		
Household income								
Low	12	32.4	25	67.6	37	100	0.04	2.703 (1.118-6.536)
High	6	12	44	88	50	100		

Based on the results of bivarate analysis using the chi-square test, it is known that the variables are Exclusive Breastfeeding, gender, history of vitamin A administration, nutritional status, history of Respiratory Tract Infections (ARI), history of asthma, history of Tuerculosis, dense residential environment, smoking behavior at home, Maternal education and maternal occupation are related to the level of pneumonia among toddlers in Jambi City with (p-value <0.05). Meanwhile, age, gender, LBW, smoking behavior at home did not correlate with the level of pneumonia (p-value >0.05).

DISCUSSION

Relationship between Age and Pneumonia Levels in Children Under Five

Based on the results of research using statistical tests using the chi square test, a p-value of 0.339 (p > 0.05) was obtained, meaning that there was no correlation between the age of toddlers and the level of toddler pneumonia in Jambi City. The results of this study are likely due to age being a supporting factor in the occurrence of pneumonia, but there are other factors that support the formation of toddler immunity such as giving vitamin A and exclusive breast milk (A'yuni et al., 2022).

In accordance with the opinion expressed by Nurjamillah in 2022 which stated that usually toddlers aged 0-23 months who experience pneumonia fall into the mild category, namely 5.7% if the toddler has good body immunity, such as due to exclusive breastfeeding for toddlers. (Nurjamillah & Dwiriani, 2022). The results of this research are also in line with research conducted by Tambun, et al in 2019 which obtained results via Chi-Square between age and the

incidence of pneumonia under five, p value = 0.414 (p > 0.05), so it shows that there is no correlation between age and the incidence pneumonia in toddlers (Tambunan et al., 2019).

According to Rigustia, in 2019 the age variable also did not have a significant correlation with toddler pneumonia. This was based on the results of bivariate analysis which obtained a p value = 0.831, this shows statistically that there is no significant correlation between toddler age and the incidence of pneumonia in toddlers due to different immunity. Each child is influenced by many factors such as exclusive breastfeeding and compliance with vitamin A consumption (Rigustia et al., 2019).

Age is indeed one of the risks thought to correlate with the incidence of pneumonia in toddlers. A number of large studies show the incidence of respiratory illnesses is soaring in children and infants (Tambunan et al., 2019). The immunity of toddlers is not as perfect as that of adults, so toddlers are at risk and vulnerable to infection from pneumonia, this is because the respiratory tract is not yet large and perfect (Rigustia et al., 2019).

In summary, while age is thought to be a risk factor for pneumonia in toddlers, the results from these studies indicate that in the specific context of Jambi City, age alone may not significantly correlate with pneumonia incidence. Other factors related to immunity and health practices likely play a more critical role.

Relationship between Gender and Pneumonia Levels in Children Under Five

Based on the results of research that has been carried out through statistical tests using the chi square test, it obtained a p-value of 0.668 (p > 0.05), this shows that there is no correlation between the gender of toddlers and the level of toddler pneumonia in Jambi City. This is possible because most of the respondents were women, 45 respondents (51.7%).

The results of this research are supported by Firda's research in 2019 which showed that 70% of pneumonia occurs in boys who are 1.5 times more likely to contract pneumonia than girls. This is also because there are more boys outside the home, so there is no significant correlation between gender and pneumonia (Firda, 2019).

This unrelated condition is also possible due to the dynamics of children's habits where both boys and girls have the same habits in playing, namely choosing to play at home with the available facilities rather than outside the home. (Firda, 2019).

The results of this research are in line with research conducted by Yuni, et al in 2022 which stated that there was no significant correlation between gender and the incidence of pneumonia in toddlers (P value 1,000). This is because male and female toddlers have the same risk of contracting pneumonia (A'yuni et al., 2022). The findings from the results of this study are also in line with Tambun, et al. in 2019 which stated that there was no correlation between gender and the incidence of pneumonia in toddlers. (Tambunan et al., 2019).

In theory, gender has the opportunity to influence pneumonia, because there are differences between men and women in pathogens and autoimmune diseases which are multifactorial in nature, including different quantities of cell types, different immune systems when exposed to pathogens (A'yuni et al., 2022).

However, immunity is not only influenced by gender, but nutrition, environment, physiology and so on, apart from that, mild pneumonia causes toddlers' immunity to still be able to fight pneumonia. In the guidebook for eradicating ISPA in Sangadji, DK in 2022, for the prevention of pneumonia, male toddlers have a greater risk of contracting pneumonia than female toddlers, this is because the lung diameter of males is smaller than that of females. This is a possibility why the results of the research conducted by researchers do not have a significant correlation because the majority of respondents were female, namely 45 respondents. (51.7%) (Sangadji et al., 2022).

Overall, while gender theoretically has the potential to influence pneumonia risk, the findings from these studies suggest that in the context of Jambi City, gender alone may not be a significant determinant of pneumonia incidence in toddlers. Other factors such as nutritional status, environment, and immune system health are likely more influential.

The Relationship between Exclusive Breastfeeding and Pneumonia Levels in Children Under Five

Based on the results of research carried out through statistical tests with the chi square test, a p-value of 0.00 (p < 0.05) was obtained, this shows that there is a correlation between exclusive breastfeeding and the level of toddler pneumonia in Jambi City.

According to Sulistiningsih in 2020, it was stated that one of the things that affects pneumonia is breast milk, which when a child is given breast milk has a lower risk than if it is not given, this is because breast milk is an immune substance that the baby has not yet made, so that bacteria or viruses that enter can enter. attacked by the formed immunity (Sulistiningsih, 2020).

The results of this research were supported by Hasanah and Santik in 2022 who proved that there was a correlation between breastfeeding and toddler pneumonia (p value = 0.012). Toddlers with non-exclusive rice are 4.241 times more likely to contract pneumonia.

Breast milk is a food that contains antioxidants, nutrients and hormones for children to grow and develop, therefore toddlers who receive exclusive breast milk for 6 months experience fewer infections and have milder illnesses than those who do not receive breast milk (Hasanah et al., 2021).

Husna, et al in 2022 also stated that a history of breastfeeding had a correlation with pneumonia p-value = 0.009 < 0.05. With the analysis results, the OR value = 6,500, where toddlers who do not receive exclusive breastfeeding have a 6,500 chance of experiencing pneumonia (95% CI: 1,379-30,636) compared to toddlers who receive exclusive breastfeeding (Husna et al., 2022).

Theoretically, exclusive breast milk provides immunity to infections and allergies and stimulates the immune system. With these efforts, exclusive breastfeeding will increase and pneumonia can be prevented (Mariam & Admin, 2021). The benefits of breast milk are obtaining antibodies, protective, cellular immunity and anti-allergic substances as body protection and having good nutritional status, because the nutrients needed are sufficient.

In conclusion, exclusive breastfeeding plays a crucial role in reducing the incidence and severity of pneumonia in toddlers by providing essential nutrients and

immune protection. Promoting exclusive breastfeeding for the first 6 months of life is essential for improving child health outcomes and preventing pneumonia.

Relationship between nutritional status and levels of pneumonia in children under five

Based on the results of statistical tests using the chi square test, a p-value of 0.000 ($p < 0.05$) was obtained, this shows that there is a correlation between nutritional status and the level of pneumonia among toddlers in Jambi City.

The results of this research are in line with research conducted by Hasanah and Santik in 2021 which stated that there was a correlation between nutritional status and the incidence of toddler pneumonia in the Rembang Purbalingga Community Health Center working area (Hasanah et al., 2021).

The results of this research are in contrast to research conducted by Subandi, Endang in 2020 which stated that the majority of pneumonia respondents had good nutritional status and obtained a value of $p = 0.88$ ($p > 0.05 \rightarrow$ Ho is accepted), which means there is no Correlation of nutritional status of toddlers with the incidence of pneumonia in toddlers (Subandi, 2020).

From the results of this study it can be said that nutritional status is not a fundamental factor in the occurrence of pneumonia because the majority of respondents have good nutrition, so the results of this study can be said to have no correlation between the nutritional status of toddlers and the incidence of pneumonia (Subandi, 2020).

Toddlers with poor nutritional status are 5.342 times more likely to develop pneumonia. Appropriate nutrition will prevent toddlers from contracting infections, so that their growth and development is more optimal (Hasanah et al., 2021).

Immune system disorders occur due to poor nutritional status in specific organs and lymphoid tissue that are sensitive to malnutrition. Almost comprehensively, the body's defense mechanisms will be poor in conditions of malnutrition

In conclusion, while there is a significant correlation between nutritional status and pneumonia levels in toddlers in Jambi City, the role of nutritional status in pneumonia incidence may vary depending on the overall health and environmental factors affecting the children. Adequate nutrition remains essential for promoting resilience to infections and supporting the overall health of young children.

Relationship between low birth weight and levels of pneumonia in children under five

Based on the results of the research that has been carried out, it can be seen that statistical tests using the chi square test obtained a p-value of 0.64 ($p > 0.05$), this shows that there is no correlation between LBW and the level of pneumonia among toddlers in Jambi City.

The results of this research are in line with research conducted by Fadhil, et al in 2020 which proved from the statistical calculation of the Chi-Square test of 0.069 and p-value=1, so it can be said that there is no correlation between LBW and pneumonia, perhaps due to many factors such as breastfeeding, nutritional status and so on (Fadhil et al., 2020).

The LBW factor may not have a significant correlation with mild pneumonia in toddlers because toddler pneumonia is more influenced by environmental factors, such as exposure to infections from the surrounding environment and

immunization status, which directly affect their respiratory system (Husna et al., 2022).

In line with research conducted by Husna, et al in 2022 which stated that toddlers with LBW are 25% susceptible to contracting pneumonia, the results of this statistical test do not show a correlation between LBW and the incidence of pneumonia (Husna et al., 2022).

LBW in babies in general, the formation of immune substances will be less than optimal, so there is a risk of infection, pneumonia and a greater risk of death than normal babies (Hartati et al., 2020). LBW is related to children's nutritional status which is a risk factor for the incidence of toddler pneumonia and tends to cause decreased immunity and susceptibility to disease. (Veridiana et al., 2021).

In conclusion, while LBW is a significant health concern affecting infants, its direct correlation with the incidence of pneumonia in toddlers in Jambi City was not found to be statistically significant in this study. Other factors, such as environmental conditions and immunization status, appear to play a more critical role in the development of pneumonia in young children.

Relationship between history of vitamin A administration and levels of pneumonia in children under five

Based on the results of research carried out using the chi square test, a p-value of 0.002 ($p < 0.05$) was obtained, this shows that there is a correlation between the history of vitamin A administration and the level of toddler pneumonia in Jambi City.

According to Novarianti, et al in 2021, the variable giving vitamin A capsules was also proven to be a risk factor, this is because toddlers who are not given vitamin A regularly have a risk of contracting pneumonia (Novarianti et al., 2021).

Based on the results of research conducted by Indarawati, et al in 2023, it is known that from the results of the correlation of 2 variables using the Spearman Rank Test, results were obtained with a significant level of $\alpha=0.05$. So it is said that there is a correlation between giving vitamin A and the incidence of pneumonia (Titik Indarwati et al., 2023).

Vitamin A is a determining factor in the differentiation process, especially in goblet cells producing mucus to protect epithelial cells and other dangerous particles. Vitamin A is an urgent nutrient with a role in maintaining the integrity of the respiratory tract, the body's immune system and the body's ability to fight infection. Giving vitamin A can be a preventive measure and reduce the risk of pneumonia (Murni et al., 2021)

In conclusion, preventing and managing upper respiratory tract infections, along with ensuring adequate administration of vitamin A, are critical strategies in reducing the incidence of pneumonia among children under five.

Relationship between history of upper respiratory tract infections (ARI) and levels of pneumonia in children under five

Based on the results of research conducted using the chi square test, a p-value of 0.003 ($p < 0.05$) was obtained, this shows that there is a correlation between the history of ISPA and the level of pneumonia among toddlers in Jambi City. The results of the analysis also obtained a prevalence ratio (PR) of 3,687 95%CI=1,609-8,447, meaning that toddlers who had a history of ARI were at 3,687 times the risk of

having severe pneumonia compared to toddlers who had no history of ARI.

The results of this study are in line with the Getaneh Study (2019) regarding the determinants of pneumonia among children aged 2-59 months with a history of upper respiratory tract infections who have a risk of pneumonia of 28.88 times (Getaneh et al., 2019).

Upper Respiratory Tract Infections (ARI) in children under five can develop into pneumonia, which is one of the causes of death in young children, so in Hariyanto's research in 2020, treatment of ARI at the family level was associated with severe pneumonia in children under five being treated. (Hariyanto, 2020).

Upper respiratory tract infection is defined as irritation and swelling of the upper respiratory tract that resolves, accompanied by coughing in patients who do not have other conditions causing symptoms or do not have a history of chronic obstructive pulmonary disease, emphyseme or chronic bronchitis (Thomas & Bomar, 2023).

When ARI microorganisms reach the alveolus, the activity of phagocytes, immune response cells and other antimicrobial defense factors must fight back. If these microorganisms can overcome or subvert the body's innate defenses, such as the mucociliary system, bronchoconstriction, cough reflex, or acquired immunity (mucosal immunoglobulin A), then an acute infectious process or pneumonia occurs. Infection can be acute or chronic, in the bronchi (bronchitis) or pulmonary alveoli (pneumonia), or involve both (broncho-pneumonia), so a history of ARI has a correlation with the incidence of pneumonia (Chlery et al., 2019).

Relationship between history of asthma and levels of pneumonia in children under five

Based on the results of statistical tests using the chi square test, the p-value was 0.008 ($p < 0.05$), this shows that there is a correlation between asthma and the level of pneumonia among toddlers in Jambi City.

The results of this research are in line with research conducted by Widya, et al in 2022 which proves that there is a correlation between a history of asthma and the incidence of pneumonia, where 19.5 times more children contract pneumonia than toddlers who do not have a history of asthma. (Widya et al., 2022).

According to Husna, et al, in 2022, they also stated that a history of asthma had a significant correlation with the incidence of pneumonia with a 3.9% chance compared to toddlers with no history of asthma. (Husna et al., 2022).

Toddlers with a history of asthma are at risk of disrupting the integrity of mucus and sila cells, resulting in decreased local or systemic cellular immunity (Widya et al., 2022).

Asthma is a risk factor for toddler pneumonia. Getaneh's study (2019) states that asthma has a risk of 2.05 times that of children who do not suffer from pneumonia.

Researchers suggest that early intervention and management of asthma in toddlers are essential to prevent the onset of pneumonia, emphasizing the need for comprehensive healthcare strategies to address respiratory health in children.

Relationship between history of tuberculosis (TB) and levels of pneumonia in children under five

Tuberculosis (TB) can attack various organs of the body.

Pulmonary tuberculosis (PTB) is the most common, which can mainly cause lung injury and tubercles, thus appearing as acute pneumonia. Pneumonia and tuberculosis can occur simultaneously or occur alternately, and this will cause certain difficulties in identifying these two diseases (Wei et al., 2020).

Based on the results of research carried out using the chi square test, a p-value of 0.033 (p < 0.05) was obtained, this shows that there is a correlation between the history of Tuberculosis (TB) and the level of pneumonia among toddlers in Jambi City. The results of the analysis also obtained a prevalence ratio (PR) of 2,514 (95%CI=(1,142-5,537)), meaning that toddlers with a history of Tuberculosis (TB) were 2,514 times more likely to have severe pneumonia than toddlers without a history of Tuberculosis (TB).

The results of this study are supported by research conducted by Wei in 2020 which stated that the incidence of pneumonia in PTB patients was higher than in the normal group. In some areas, such as Uganda, epidemiological analysis shows that those with severe pneumonia have a higher incidence of PTB, namely 18.9%.

A history of TB infection in family members can be a risk factor for pneumonia. Getaneh, et al (2019) study states that children with TB infection have a risk of 4.70 times compared to children who do not have TB infection (Getaneh et al., 2019).

Relationship between residential density and levels of pneumonia in children under five

Based on the results of research conducted using the chi square test, a p-value of 0.000 (p < 0.05) was obtained. This shows that there is a correlation between residential density and the level of toddler pneumonia in Jambi City.

The results of this research are in line with research by Hasanah and Santik in 2022 which stated that there was a correlation between residential density and the incidence of pneumonia and a 5,041 times greater risk of suffering from pneumonia (Hasanah et al., 2021).

The results of this research are also supported by research conducted by Mardani, et al in 2019 which stated that there was a significant correlation between housing density and pneumonia and had a 4.571 times greater risk of developing pneumonia than a group of toddlers whose houses were not crowded and met the requirements for a healthy house (Mardani et al., 2019).

According to Husna, et al. in 2022, house density has a significant correlation with evidence of OR=7,700 and has a chance of experiencing pneumonia of 7.7 (Husna et al., 2022).

The increase in pollution factors at home is influenced by the condition of the residence, lots of occupants or lack of ventilation which makes it easier to contract pneumonia.

The ratio of residents must be in accordance with the area of the house, if the house is narrow, while the number of family members is large, then it will not be balanced and healthy (Mardani et al., 2019).

Researchers suggest that improving residential conditions, including ensuring adequate space and ventilation, is crucial in reducing the incidence of pneumonia among children under five. Implementing housing policies that promote healthier living environments can significantly mitigate the risks associated with high residential density.

Relationship between smoking behavior at home and levels of pneumonia in children under five

Based on research that has been carried out, it is known that based on the results of statistical tests using the chi square test, a p-value of 0.11 (p < 0.05) was obtained. This shows that there is no correlation between smoking behavior at home and the level of toddler pneumonia in Jambi City. This is because 58 toddlers (76.3%) with exposure to cigarettes at home had mild pneumonia and 11 toddlers (100%) without exposure to cigarettes at home had mild pneumonia.

The results of this research were supported by Hasanah and Santik. In 2022, it was discovered that there was no correlation between the smoking habits of family members and the incidence of toddler pneumonia. Toddlers whose family members smoke have a 3,619 greater risk of contracting pneumonia, but in this study it is likely that at the time of the study none of the members smoked. (Hasanah et al., 2021).

The results of this research are in line with research conducted by Wahyuni, et al in 2020 which proved that there was no correlation between smoking habits at home and the incidence of pneumonia.

Parental smoking behavior is an environmental factor and makes toddlers susceptible to contracting pneumonia (Anwar & Dharmayanti, 2020). Members who smoke pose a risk of respiratory problems in children, this is because they contain dangerous chemical components such as nicotine, tar, NO and others which cause respiratory problems.

The dangers of smoking not only affect smokers, but also the people around them, especially family members and toddlers (Veridiana et al., 2021).

The smoking factor may not have a significant correlation with the incidence of mild toddler pneumonia because toddlers usually do not smoke directly. However, exposure to cigarette smoke from adults who smoke around toddlers can increase their risk of pneumonia. In addition, other factors such as environmental cleanliness, exposure to infections from other children in the child's living or care environment, and nutritional status may have a greater correlation with the incidence of pneumonia in toddlers. (Beletew et al., 2020).

The immature immune system of children and infants makes it easier for infections to attack the lungs, and prolonged exposure to cigarette smoke can increase the frequency of respiratory tract infections. The longer the exposure to cigarette smoke, the higher the risk of toddlers contracting pneumonia (Veridiana et al., 2021).

Cigarettes have a negative impact on both active and passive smokers, they are very dangerous for children or babies who inhale cigarette smoke (Wahyuni et al., 2020).

Researchers suggest focusing on comprehensive public health strategies that address multiple factors, including smoking cessation programs and improving environmental cleanliness, to effectively reduce the incidence of pneumonia in children under five.

Relationship between maternal education level and level of pneumonia in children under five

Based on the results of research carried out through statistical tests using the chi square test, a p-value of 0.025 (p < 0.05) was obtained, this shows that there is a correlation between the level of education and the level of

pneumonia among toddlers in Jambi City.

The results of this research are in line with research conducted by Mardani, et al in 2019 which stated that there was a significant correlation between maternal educational status and the incidence of toddler pneumonia. The mother's low educational level led to poor care interventions for her toddler children, so that germs were easily exposed to them. (Mardani et al., 2019).

Education becomes a planned and conscious effort to create a learning atmosphere and learning process, so that you can actively develop yourself (Mardani et al., 2019). Low level of education determines the level of behavior and knowledge which is the domain of urgency in personal action intervention (Wahyuni et al., 2020).

Mothers with high education will have the attitude of taking their child to phasex, but with low education mothers have to treat themselves or a dukun (Mardani et al., 2019).

Researchers suggest that improving maternal education could be a strategic measure to reduce the incidence of pneumonia in children under five, as it equips mothers with better knowledge and practices in child healthcare.

The Relationship between Maternal Occupation and Pneumonia Levels in Children Under Five

Mothers who work outside have a chance of their children contracting pneumonia because of the time they spend working and lack of child health care, so they receive less attention and are susceptible to disease (Mardani et al., 2019).

Based on the results of the research that has been carried out, it is known that the statistical test results obtained a p-value of 0.036 ($p < 0.05$), this shows that there is a correlation between maternal employment and the level of toddler pneumonia in Jambi City. The results of the analysis also obtained a prevalence ratio (PR) value of 0.753 (95%CI=(1.192-7.831)), meaning that respondents who worked were 0.753 times more likely to have children under five with severe pneumonia compared to respondents who did not work.

The results of this study are in line with Hasanah and Santik in 2022 who stated that there was a correlation between maternal employment and (p value= 0.019) and a 4.235 times greater risk of contracting pneumonia.

Mothers who work will have less time to care for and pay attention to their children, so that children become vulnerable to diseases, one of which is pneumonia, so it can be said that the mother's work is correlated with the incidence of pneumonia (Mardani et al., 2019).

Researchers suggest that policies and support systems be developed to help working mothers balance their professional and caregiving responsibilities, as this could mitigate the risk of pneumonia and other health issues in their children.

Relationship between Household Income and Pneumonia Levels in Children Under Five in Jambi City

Based on the results of research that has been carried out, it is known that the results of statistical tests using the chi square test obtained a p-value of 0.036 ($p < 0.05$), this shows the correlation between mother's work and the level of toddler pneumonia in Jambi City. The results of the analysis also obtained a prevalence ratio (PR) value of 0.753 (95%CI=(1.192-7.831)), meaning that respondents who worked were 0.753 times more likely to have children under five

with severe pneumonia compared to respondents who did not work.

The results of this research are in line with research conducted by Hasanah and Santik in 2022 which stated that there was a correlation between work status and pneumonia with the risk. Toddlers whose mothers work are 4.235 times more likely to contract pneumonia (Hasanah et al., 2021).

The results of this research are also supported by research conducted by Mardani, et al in 2019 which states that a high income provides a great opportunity to provide housing that complies with health regulations, thereby avoiding pneumonia (Mardani et al., 2019).

The level of household income has a correlation with the incidence of pneumonia, because the risk of pneumonia for toddlers in households with low or middle economic levels is 1.19 times the risk, because parents with high incomes have good skills in meeting needs, including health care. (Hasanah et al., 2021).

Researchers recommend implementing economic support and health education programs to assist low-income families in improving their living conditions and healthcare access, which could reduce the incidence of pneumonia among children under five.

CONCLUSIONS

In conclusion, there is a correlation between exclusive breastfeeding, nutritional status, history of Vitamin A administration, history of ARI, history of asthma, history of Tuberculosis, dense residential environment, mother's education, mother's occupation, and household income with the level of toddler pneumonia in Jambi City in 2023. Meanwhile Therefore, there is no correlation between age, gender, history of low birth weight, and smoking behavior at home with the level of pneumonia under five in Jambi City in 2023. It is recommended to increase the promotion of exclusive breastfeeding, improve nutrition, and Vitamin A supplements in preventing pneumonia in children under five in Jambi City, as well as the need to pay attention to the residential environment, education, maternal employment, and household income as socio-economic factors that influence the incidence of childhood pneumonia.

REFERENCES

A'yuni, Z. Q., Mamesah, L. S. S., & Marhana, I. A. (2022). Faktor Jenis Kelamin Dan Status Imunisasi Terhadap Kejadian Pneumonia Pada Balita Di Rsud Dr. Soedarso. *Jurnal Bidan Cerdas*, *4*(4). Https://Doi.Org/10.33860/Jbc.V4i4.1635

Andualem, Z., Adane, T., Tigabu, A., Yallew, W. W., Wami, S. D., Dagne, H., Azanaw, J., Guyasa, G., Nigussie Azene, Z., & Endalew, M. (2020). Prevalence And Predictors-A Community-Based Cross-Sectional Study. *International Journal Of Pediatrics*, *2020*.

Anwar, A., & Dharmayanti, I. (2020). Pneumonian Among Children Under Five Years Of Age In Indonesia. *Urology*, *8*(8). Https://Doi.Org/10.1016/S0090-4295(00)00847-5

Beletew, B., Bimerew, M., Mengesha, A., Wudu, M., & Azmeraw, M. (2020). Prevalence Of Pneumonia And Its Associated Factors Among Under-Five Children In East Africa: A Systematic Review And Meta-Analysis. *Bmc*

Pediatrics, *20*(1). Https://Doi.Org/10.1186/S12887-020-02083-Z

Chlery, S. M., Ramage, G., & Bagg, J. (2019). Respiratory Tract Infections And Pneumonia. *Narratives Of Therapists' Lives*, *49*(1).

Dinas Kesehatan Provinsi Jambi. (2019). *Profil Kesehatan 2019*.

Fadhil, M., Tanuwidjaja, S., & Azhali, B. A. (2020). Hubungan Bblr Terhadap Pneumonia Pada Anak Usia 0-59 Bulan Di Kota Bandung Pada Tahun 2017. *Prosiding Pendidikan Dokter*, *4*(2).

Firda, F. (2019). Hubungan Usia Anak, Jenis Kelamin Dan Berat Badan Lahir Anak Dengan Kejadian Pneumonia. *Jurnal Kesehatan Metro Sai Wawai*, *8*(2).

Getaneh, S., Alem, G., Meseret, M., Miskir, Y., Tewabe, T., Molla, G., & Belay, Y. A. (2019). Determinants Of Pneumonia Among 2-59 Months Old Children At Debre Markos Referral Hospital, Northwest Ethiopia: A Case-Control Study. *National Central For Biotehnology Information*.

Hariyanto, H. (2020). *Determinan Berhubungan Dengan Kejadian Pneumonia Pada Anak-Anak Usia 12-59 Bulan*.

Hartati, S., Nurhaeni, N., & Gayatri, D. (2020). Faktor Risiko Terjadinya Pneumonia Pada Anak Balita. *Jurnal Keperawatan Indonesia*, *15*(1). Https://Doi.Org/10.7454/Jki.V15i1.42

Hasanah, U., Dyah, Y., & Santik, P. (2021). Faktor Intrinsik Dan Extrinsik Yang Berhubungan Dengan Kejadian Pneumonia Di Wilayah Puskesmas Rembang. *Jurnal Kesehatan Masyarakat Indonesia*, *16*.

Husna, M., Pertiwi, F. D., & Nasution, A. S. (2022). Faktor-Faktor Yang Berhubungan Dengan Kejadian Pneumonia Pada Balita. *Jurnal Media Kesehatan*, *9*(2). Https://Doi.Org/10.33088/Jmk.V9i2.303

Jambi, D. K. P. (2021). *Rencana Strategis Dinas Kesehatan Provinsi Jambi Tahun 2021-2026*. *08*.

Kementrian Kesehatan Ri. (2021). Indonesia Health Profile 2020. In B. Hardhana, F. Sibuea, & W. Widiantini (Eds.), *Kementerian Kesehatan Republik Indonesia*. Kementrian Kesehatan Republik Indonesia.

Mardani, R. P. P. K., Wardani, H. E., & Gayatri, R. W. (2019). Hubungan Faktor Lingkungan Fisik Rumah, Status Pendidikan Ibu, Dan Status Pekerjaan Ibu Terhadap Kejadian Pneumonia Balita Di Wilayah Kerja Puskesmas Diyono Malang. *Jurnal Sport Science And Health*, *1*(3).

Mariam, E., & Admin, A. (2021). Hubungan Pemberian Asi Eksklusif Dengan Kejadian Pneumonia Pada Balita Di Puskesmas Yosomulyo Kecamatan Metro Pusat Kota Metro. *Jurnal Kesehatan*, *7*(4). Https://Doi.Org/10.55919/Jk.V7i4.57

Murni, I. K., Prawirohartono, E. P., & Triasih, R. (2021). Potential Role Of Vitamins And Zinc On Acute Respiratory Infections Including Covid-19. *Global Pediatric Health*, *8*(1). Https://Doi.Org/10.1177/2333794x211021739

Novarianti, W., Syukri, M., Izhar, M. D., Ridwan, M., & Faisal, F. (2021). Status Gizi Dan Pemberian Kapsul Vitamin A Sebagai Faktor Risiko Pneumonia Balita Usia 18-59

Bulan. *Jurnal Bidan Cerdas*, *3*(2).Https://Doi.Org/10.33860/Jbc.V3i2.418

Nurjamillah, S. Y., & Dwiriani, C. M. (2022). Faktor Kejadian Pneumonia Balita Di Wilayah Kerja Puskesmas Unyur Kota Serang. *Jurnal Ilmu Gizi Dan Dietetik*, *1*(2). Https://Doi.Org/10.25182/Jgid.2022.1.2.95-102

Rigustia, R., Zeffira, L., & Vani, A. (2019a). Faktor Risiko Yang Berhubungan Dengan Kejadian Pneumonia Pada Balita Di Puskesmas Ikur Koto Kota Padang. *Health & Medical Journal*, *1*(1).

Rigustia, R., Zeffira, L., & Vani, A. T. (2019b). Faktor Risiko Yang Berhubungan Dengan Kejadian Pneumonia Pada Balita Di Puskesmas Ikur Koto Kota Padang. *Health & Medical Journal*, *1*(1). Https://Doi.Org/10.33854/Heme.V1i1.215

Rina, A., Norfai, & Anggaraeni, S. (2020). Analisis Faktor Internal Dan External Dengan Kejadian Pneumonia Pada Balita Di Wilayah Kerja Puskesmas Pekauman Kota Banjar Masin Tahun 2020. *Fakultas KesehatanMasyarakatUniversitas Islam Kalimantan*, *2*(2).

Sangadji, N. W., Okta Vernanda, L., Muda, A. K., & Veronika, E. (2022). Hubungan Jenis Kelamin, Status Imunisasi Dan Status Gizi Dengan Kejadian Pneumonia Pada Balita (0-59 Bulan) Di Puskesmas Cibodasari Tahun 2021. *Jca Health Science*, *2*(2).

Subandi, E. (2020). Hubungan Status Gizi Balita Dengan Kejadian Pneumonia Pada Balita Di Desa Sutawangi Wilayah Kerja Uptd Puskesmas Dtp Jatiwangi Tahun 2019. *Jurnal Health Sains*,*1*(2).Https://Doi.Org/10.46799/Jsa.V1i2.31

Sulistiningsih, A. (2020). Hubungan Pemberian Asi Eksklusif Dengan Kejadian Pneumonia Pada Balita Di Puskesmas Piyungan Bantul. *Universitas 'Aisyiyah Yogyakarta*, 3–13.

Tambunan, S., Suharyo, & Saptorini, K. K. (2019). *Faktor-Faktor Risiko Kejadian Pneumonia Pada Balita Di Wilayah Kerja Puskesmas Kedungmundu Kota Semarang*. *2*(1).

Veridiana, N. N., Octaviani, O., & Nurjana, M. A. (2021). Faktor Internal Dan Eksternal Kejadian Pneumonia Pada Anak Bawah Dua Tahun Di Indonesia. *Buletin Penelitian Kesehatan*, *49*(3). Https://Doi.Org/10.22435/Bpk.V49i3.4802

Wahyuni, N. T., Aeni, H. F., & Azizudin, M. (2020). Hubungan Kebiasaan Merokok Di Dalam Rumah Dengan Kejadian Pneumonia Pada Anak Usia 1-4 Tahun. *Jurnal Smart Kebidanan*, *7*(2). Https://Doi.Org/10.34310/Sjkb.V7i2.388

Wei, M., Zhao, Y., Qian, Z., Yang, B., Xi, J., & Wei, J. (2020). Pneumonia Caused By Mycobacterium Tuberculosis. *Pubmed Central*, *22*(6).

Widya, W., Widjanarko, B., Kartini, A., Sutiningsih, D., & Suhartono, S. (2022). Hubungan Riwayat Asma Dan Riwayat Komorbiditas Dengan Kejadian Pneuomonia Pada Balita (Studi Di Wilayah Kerja Puskesmas Bandaharjo Kota Semarang).*JurnalEpidemiologi Kesehatan Komunitas*, *7*(1). Https://Doi.Org/10.14710/Jekk.V7i1.10076