

## Factors Associated with Pneumonia among Children at Namang Primary Health Center

Lia Marluzianty<sup>1</sup>, Indri Puji Lestari<sup>1</sup>

<sup>1</sup>Department of Nursing, Institut Citra Internasional, Bangka Belitung, Indonesia

Correspondence author: Lia Marluzianty

Email: [iciliamarluzianty@gmail.com](mailto:iciliamarluzianty@gmail.com)

Address: Jl. Pangkalpinang-Muntok, Cengkong Abang, Kec. Mendo Bar., Kabupaten Bangka, Kepulauan Bangka Belitung 085366036644

DOI: <https://doi.org/10.56359/gj.v7i2.1037>



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

### ABSTRACT

**Introduction:** Pneumonia remains a major cause of morbidity and mortality among children worldwide, particularly in developing countries, and is strongly associated with preventable risk factors such as inadequate nutrition, incomplete immunization, and lack of exclusive breastfeeding. This study aims to analyze the relationship between exclusive breastfeeding, nutritional status, and immunization status with the incidence of pneumonia among children in the working area of Namang Community Health Center.

**Objective:** This study aims to analyze the association between exclusive breastfeeding, nutritional status, and immunization status and the incidence of pneumonia among children in the working area of the Namang Community Health Center in 2025.

**Method:** This study used a cross-sectional design with independent variables (exclusive breastfeeding, nutritional status, and immunization history) and dependent variable (pneumonia incidence in children). The population size in this study was 501 people, and a sample of 91 people was calculated using simple random sampling.

**Result:** The results of the study using the Chi-Square statistical test obtained a p-value of  $0.000 < 0.05$  for the exclusive breastfeeding variable,  $0.000 < 0.000$  for nutritional status, and  $0.000 < 0.05$  for immunization history. This indicates a significant relationship between exclusive breastfeeding, nutritional status, and immunization history and the incidence of pneumonia in children in the Namang Community Health Center Work Area in 2025.

**Conclusion:** The recommendations in this study are expected to serve as a reference source and provide insights for nursing students during their field practice, so that they understand the factors that can influence the incidence of pneumonia in children.

**Keywords:** exclusive breastfeeding, immunization history, nutritional status, pneumonia incidence in children

## Introduction

Pneumonia is an inflammation of the lungs caused by infection. Pneumonia can cause mild to severe symptoms. Some common symptoms in pneumonia sufferers are a cough with phlegm, fever, and shortness of breath. Pneumonia is also known as wet lung. In this condition, the infection causes inflammation of the air sacs (alveoli) in one or both lungs. As a result, the alveoli can fill with fluid or pus, making it difficult to breathe (WHO, 2021). Pneumonia is a form of acute respiratory infection that affects the lungs. The lungs are composed of small sacs called alveoli, which fill with air when a healthy person breathes. When someone has pneumonia, the alveoli fill with pus and fluid, making breathing painful and limiting oxygen intake (WHO, 2021).

According to the World Health Organization (WHO), pneumonia caused 740,180 deaths in children under 5 years of age in 2021, accounting for 14% of all infant deaths. The WHO states that pneumonia is the leading cause of illness in toddlers, surpassing other diseases such as measles and malaria. Pneumonia cases are prevalent in developing countries, such as Southeast Asia (39%) and Africa (30%). The WHO states that Indonesia ranks eighth among 15 countries worldwide for infant and child mortality rates due to pneumonia. Pneumonia is also the leading cause of infant mortality in Indonesia. Global estimates indicate that 71 children in Indonesia contract pneumonia every hour (WHO, 2021).

The Indonesian Health Survey (SKI) report states that the prevalence of pneumonia in children in Indonesia was 441,424 cases in 2021, 624,206 cases in 2022, 715,760 cases in 2023, and increased to 857,483 cases in 2024. Risk factors include poor nutritional status, immunization status, and environmental conditions such as overcrowding and smoking in the home (SKI, 2025). Data from the Bangka Belitung Provincial Health Office in 2022 showed 2,749 cases of pneumonia in children. In 2023, there were 2,678 cases of pneumonia in children. In 2024, there were 2,078 cases of pneumonia in children (Bangka Belitung Provincial Health Office, 2025). Data on childhood illnesses in Central Bangka Regency shows that in 2022, there were 600 cases of pneumonia in children. In 2023, there were 902 cases of pneumonia in children. Meanwhile, in 2024, there were 750 cases of pneumonia in children (Central Bangka Regency Health Office, 2025). Data on the incidence of pneumonia in toddlers in the Namang Community Health Center work area has increased over the past three years. In 2022, the incidence of pneumonia in children was 78 cases, 90 in 2023, and a continued increase to 85 cases in 2024 (Namang Community Health Center Medical Records, 2025).

Risk factors for pneumonia can be caused by intrinsic and extrinsic factors. Intrinsic factors include age, gender, nutritional status, low birth weight, immunization status, exclusive breastfeeding, and vitamin A supplementation. Extrinsic factors include residential density, air pollution, house type, ventilation, humidity, kitchen location, fuel type, mosquito repellent use, cigarette smoke, family income, and maternal factors, including education, age, and knowledge (Padila, 2017). Exclusive breastfeeding is the provision of only breast milk to infants aged 0-6 months without additional fluids such as formula, orange juice, honey, tea, water, or solid foods such as bananas, papaya, porridge, milk, biscuits, or rice porridge. Exclusive breastfeeding is the provision of breast milk without additional food and drinks (including orange juice, honey, sugar water) starting from birth until the age of 6 months. Breast milk protects babies from various infectious diseases, breast milk contains immunoglobulin (antibodies) and white blood cells that can protect babies from infectious diseases such as: respiratory tract infections (pneumonia and bronchitis), middle ear infections (otitis media), or urinary tract infections, in other words that babies who are not given exclusive breastfeeding are very vulnerable or susceptible to infectious diseases such

as: respiratory tract infections (pneumonia and bronchitis), middle ear infections (otitis media), or urinary tract infections (Padila, 2017).

Based on the results of a survey conducted in the Namang Community Health Center Working Area during a visit, it showed that many cases of pneumonia occurred because parents did not recognize the early symptoms that occurred in their children. Children did not receive exclusive breastfeeding because some mothers produced little breast milk and did not know the importance of providing exclusive breastfeeding, nutritional status was also less noticed by parents seen from the child's weight that was not appropriate for his age and the status of immunization given to the child was incomplete. Therefore, researchers were interested in conducting research on the relationship between exclusive breastfeeding, nutritional status and immunization status with the incidence of pneumonia in children.

### Objective

This study aims to analyze the association between exclusive breastfeeding, nutritional status, and immunization status and the incidence of pneumonia among children in the working area of the Namang Community Health Center in 2025.

### Method

This study applied a quantitative research approach using a cross-sectional design to examine the relationships between exclusive breastfeeding, nutritional status, and immunization history as independent variables and the incidence of pneumonia in children as the dependent variable. The study was conducted in the working area of Namang Community Health Center.

The population consisted of 501 children who met the inclusion criteria. A sample of 91 respondents was selected using a simple random sampling technique to ensure that each member of the population had an equal chance of being included in the study. Data were collected simultaneously using structured questionnaires and observation sheets to obtain information on breastfeeding history, nutritional status, immunization status, and pneumonia incidence.

Data analysis was carried out in two stages. Descriptive analysis was used to describe the characteristics of respondents and study variables. Bivariate analysis was then performed using the Chi-Square test to determine the association between each independent variable and the incidence of pneumonia. Statistical significance was determined at a confidence level of 95% with a p-value threshold of 0.05.

### Result

Table 1. The Relationship between Exclusive Breastfeeding and Pneumonia

Breastfeeding Exclusive	Pneumonia Incidence				Total		p- value	POR (CI 95%)
	Pneumonia		Not Pneumonia		N	%		
	n	%	n	%				
Exclusive Breastfeeding	7	14.9	38	86.4	45	49.5	0.000	6.474 (3.038- 13.797)
Not Exclusive	40	85.1	6	13.6	46	50.5		
Breastfeeding	47	100.0	44	100.0	91	100		

Table 1 shows that 40 respondents (85.1%) experienced pneumonia and were not exclusively breastfed, while 7 respondents were exclusively breastfed. (14.9%). Meanwhile, 38 respondents (86.4%) did not experience pneumonia and were exclusively breastfed, while 6 respondents (13.6%) were not. The Chi-Square Test showed a significance value of  $0.000 < 0.05$ . This indicates a significant relationship between exclusive breastfeeding and the incidence of pneumonia. The POR (95% CI) value was 6.474 (3.038-13.797), meaning that respondents who were not exclusively breastfed were 6.474 times more likely to develop pneumonia.

Table 2. The Relationship between Exclusive Breastfeeding and Pneumonia Incidence

Nutritional Status	Pneumonia Incidence				Total		p-value	POR (CI 95%)
	Pneumonia		Not Pneumonia		n	%		
	n	%	n	%				
Good	8	17	34	77.3	42	46.2	3.967	
Poor	39	83	10	22.7	49	53.8	0.000	
<b>Total</b>	47	100	44	100	91	100	7.029)	

Table 2 indicates that the majority of respondents with pneumonia had poor nutritional status, accounting for 39 individuals (83%), compared to only 8 respondents (17%) with good nutritional status. In contrast, among respondents who did not experience pneumonia, most had good nutritional status (34 respondents; 77.3%), while 10 respondents (22.7%) had poor nutritional status. The Chi-Square test produced a p-value of 0.000, which is lower than the significance level of 0.05, indicating a statistically significant association between nutritional status and the incidence of pneumonia. The Prevalence Odds Ratio (POR) was 3.967 (95% CI: 2.239–7.029), suggesting that children with poor nutritional status had nearly four times higher odds of developing pneumonia compared to those with good nutritional status.

Table 3. Relationship of Immunization History to Pneumonia Incidence

Immunization History	Pneumonia Incidence				Total		p-value	POR (CI 95%)
	Pneumonia		Not Pneumonia		n	%		
	n	%	n	%				
Complete	8	17	35	79.5	43	47.3	4.341	
Incomplete	39	83	9	20.5	48	52.7	0.000	
<b>Total</b>	47	100	44	100	91	100	7.957)	

Table 3 shows that 39 respondents experienced pneumonia and had an incomplete immunization history. (83%) was higher than the 8 respondents with a complete immunization history (17%). Meanwhile, 35 respondents (79.5%) had no pneumonia and had a complete immunization history, outnumbering 9 respondents (20.5%). The Chi-Square Test showed a significance value of  $0.000 < 0.05$ . This indicates a significant relationship between immunization history and the incidence of pneumonia. The POR (95% CI) value was 4.341 (2.368-7.957), meaning respondents with an incomplete immunization history were 4.341 times more likely to develop pneumonia.

## **Discussion**

According to researchers, exclusive breastfeeding for the first six months of life benefits the baby's immune system, growth, and development. Breast milk can boost immunity because it contains the right levels of protein, fat, sugar, and calcium. It also contains substances called antibodies. These antibodies, or immune substances, can protect babies from various diseases. These antibodies are not found in formula milk. Therefore, exclusive breastfeeding plays a role in reducing the morbidity and mortality of infants with pneumonia.

According to researchers, poor nutritional status increases the risk of pneumonia. Poor nutrition compromises a child's immune system. Malnutrition is a factor in high mortality and morbidity because malnutrition weakens a child's immune system. Ultimately, children with compromised or weakened immune systems are more likely to suffer from recurrent pneumonia or be unable to fully overcome the disease.

According to researchers, a child's history of complete immunization significantly influences the incidence of pneumonia. Providing basic and follow-up immunizations during childhood aims to develop the immune system in infants and toddlers. This aims to prevent the emergence of certain diseases in both individuals and groups. These diseases include measles and pertussis, so it is hoped that these immunizations can prevent toddlers from contracting measles and pertussis, thus preventing complications such as pneumonia.

## **Conclusion**

There were significant relationships between exclusive breastfeeding, nutritional status, and immunization history with pneumonia incidence in the working area of Namang Community Health Center, while sodium consumption was not associated with hypertension in the coastal area of Benteng Community Health Center in 2025.

## **Acknowledgement**

Not applicable.

## **Authors' contribution**

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

## **Conflict of interest**

The authors declare that there is no conflict of interest regarding the publication of this paper. This research was conducted independently without any financial, commercial, or personal relationships that could be construed as a potential conflict of interest. All processes, including study design, data collection, analysis, and manuscript preparation, were carried out objectively and without external influence.

## **Ethical consideration**

Not applicable.

## **Funding**

This research is not funded by any party and is not intended for any financial gain.

## References

1. Alfaqinisa, R. (2015). Hubungan antara tingkat pengetahuan, sikap, dan perilaku orang tua tentang pneumonia dengan tingkat kekambuhan pneumonia pada balita di wilayah kerja Puskesmas Ngesrep Kota Semarang. Universitas Negeri Semarang.
2. Alvionita, V., Sulfatimah, Astuti, & Nurfitri. (2022). Hubungan status gizi dan status imunisasi dengan kejadian pneumonia pada bayi. *Ahmar Metastasis Health Journal*, 1(4), 137–143.
3. Brunner, L. S., & Suddarth, D. S. (2017). Buku ajar keperawatan medikal bedah (Edisi 8, Vol. 2). Jakarta: EGC.
4. Callistania, C., & Indrawati, W. (2017). *Pneumonia*. Jakarta: Media Aesculapius.
5. Erliandani, M., Priono, R. I. P., Ruqqayah, S., & Benvenuto, A. F. (2023). Hubungan riwayat pemberian ASI eksklusif, berat badan lahir rendah, dan kondisi fisik rumah dengan kejadian pneumonia pada balita. *Jambura Journal of Health Science and Research*.
6. Indarwati, T., Salam, A. Y., & Roisah. (2023). Hubungan riwayat imunisasi dan pemberian vitamin A dengan kejadian pneumonia pada balita di ruang rawat inap RSUD Pasirian Lumajang. *Journal Nursing Research Publication Media*, 2(2). <https://doi.org/10.55887/nrpm.v2i2.40>
7. Jasmine, N. A. L., Anulus, A., Mahdaniyati, A., & Sahrin. (2023). Hubungan pemberian ASI eksklusif, BBLR, dan status gizi terhadap kejadian pneumonia pada bayi di RSUD Patuh Patuh Lombok Barat tahun 2022. *Midwifery Student Journal*, 2(2).
8. Jumiati, & Qonita. (2020). Hubungan perilaku, sikap, dan pengetahuan ibu serta keterpaparan informasi terhadap kejadian pneumonia pada balita. *Journal of Applied Health Research and Development*, 2(2).
9. Kasjono, H. S. (2017). *Penyehatan pemukiman*. Yogyakarta: Gosyen Publishing.
10. Kementerian Kesehatan Republik Indonesia. (2019). *Profil kesehatan Indonesia 2019*. Jakarta: Kemenkes RI.
11. Mahlufi, E. D. (2021). Perbedaan efektivitas pengetahuan berdasarkan penggunaan media aplikasi dan leaflet dalam gizi seimbang masa balita. Poltekkes Kemenkes Yogyakarta.
12. Mubarak, W. I. (2017). *Ilmu kesehatan masyarakat: Teori dan aplikasi*. Jakarta: Salemba Medika.
13. Notoatmodjo, S. (2018). *Metodologi penelitian kesehatan*. Jakarta: Rineka Cipta.
14. Notoatmodjo, S. (2018). *Ilmu perilaku kesehatan*. Jakarta: Rineka Cipta.
15. Nurarif, A. H., & Kusuma, H. (2016). *Terapi komplementer akupresur*.
16. Padila. (2017). *Asuhan keperawatan penyakit dalam*. Yogyakarta: Nuha Medika.
17. Prasteyo, R. T., Benvenuto, A. F., Nirmala, S., & Sahrin. (2023). Hubungan status gizi dengan kejadian pneumonia pada anak di Kabupaten Lombok Utara. *Nusantara Hasana Journal*, 2(12), 54–62.
18. Rahima, P., Maidartati, Hayati, S., & Hartinah, N. (2022). Hubungan kejadian pneumonia dengan pemberian ASI eksklusif pada balita. *Jurnal Keperawatan BSI*, 10(1).
19. Ryusuke, O., & Damayanti, K. (2017). *Konsep dasar penyakit pneumonia*.
20. Said, M. (2017). *Pneumonia pada anak balita*. Jakarta: Ikatan Dokter Anak Indonesia.
21. Sugiyono. (2015). *Metode penelitian kombinasi (mixed methods)*. Bandung: Alfabeta.

22. Suyono. (2016). Ilmu kesehatan masyarakat dalam konteks kesehatan lingkungan. Jakarta: EGC.
23. UNICEF & World Health Organization. (2018). Pneumonia: The leading cause of death in children. Geneva: UNICEF & WHO.
24. Usman, S. N. A., Kadir, L., & Mokodompis, Y. (2025). Hubungan perilaku merokok keluarga dan pemberian ASI eksklusif dengan kejadian pneumonia pada bayi usia 6–24 bulan di wilayah Puskesmas Kota Tengah Kota Gorontalo. *Jurnal Kolaboratif Sains*, 8(1), 126–134.
25. Wahyuningsih. (2020). Analisis faktor penyebab rendahnya pemberian ASI eksklusif pada ibu bekerja di wilayah Kudu Kecamatan Genuk Kota Semarang. Universitas Islam Sultan Agung.
26. World Health Organization. (2021). Pneumonia. Geneva: WHO.