

RELATIONSHIP BETWEEN MEMBERS' SMOKING HABITS FAMILY WITH PNEUMONIA INCIDENT IN TODDLERS AGED 1-5 YEARS IN SIDOMULYO, SEMEN

Lya Fitria Nanda¹, Herdian Fitria Widyanto Putri²

¹Department of Midwifery, Faculty of Health, Institut Ilmu Kesehatan Bhakti Wiyata, Indonesia

Email: herdian.putri@iik.ac.id

ABSTRACT

Article Information
Article History:
Submitted: 24 Januari 2026
Accepted: 27 Januari 2026
Publish Online: 27 Januari 2026

Background: Pneumonia is a leading cause of death in infants, characterized by inflammation and fluid buildup in the alveoli. Smoking indoors is a risk factor. **Objective:** To determine the relationship between smoking habits of family members and the incidence of pneumonia in toddlers aged 1–5 years in Sidomulyo Semen Village. **Method:** The study used a correlational study with a case-control approach, conducted in February 2025. A sample of 34 toddlers was selected through purposive sampling with inclusion criteria of toddlers aged 1–5 years old recorded in the medical records of the Semen Community Health Center, domiciled in Sidomulyo Village, both toddlers with a history of pneumonia and not, and their families willing to be respondents. Exclusion criteria included toddlers who moved domicile during the study, families who refused to be respondents and data that did not match the medical records. Data collection used questionnaires and secondary data. Data analysis used Chi-Square. **Results:** 38.2% smoked always, 32.4% smoked rarely, and 29.4% smoked frequently. P-value of 0.006 ($p < 0.05$) and the odds ratio of 1,143. **Conclusion:** There is a significant association between family members' smoking habits and the incidence of pneumonia in toddlers, with a 1.1-fold increased risk of developing pneumonia. **Recommendation:** This can be used as a basis for education in educational institutions and community health centers,

as well as increasing public awareness of the dangers of cigarette smoke to toddler health.

Keyword: Pneumonia, Children, Smoking Habit, Family, Cigarette Smoke

ABSTRAK

Latar Belakang: Pneumonia merupakan salah satu penyebab kematian balita yang ditandai dengan peradangan dan penumpukan cairan di alveoli. Salah satu faktor risikonya adalah kebiasaan merokok didalam rumah. Tujuan: Mengetahui hubungan antara kebiasaan merokok anggota keluarga dengan kejadian pneumonia pada balita usia 1–5 tahun di Desa Sidomulyo Semen. Metode: Penelitian menggunakan studi korelasional dengan pendekatan case-control, dilaksanakan pada Februari 2025. Jumlah sampel 34 balita dipilih melalui purposive sampling dengan kriteria inklusi balita usia 1–5 tahun tercatat rekam medis Puskesmas Semen, berdomisili di Desa Sidomulyo, baik balita dengan riwayat pneumonia maupun tidak, serta keluarganya bersedia menjadi responden. Kriteria eksklusi mencakup balita yang pindah domisili selama penelitian, keluarga yang menolak menjadi responden serta data tidak sesuai dengan rekam medis. Pengumpulan data menggunakan kuesioner dan data sekunder. Analisis data menggunakan uji Chi-Square. Hasil: 38,2% merokok selalu, 32,4% merokok jarang, dan 29,4% merokok sering. Hasil uji Chi-square menunjukkan nilai p-value sebesar 0,006 ($p < 0,05$) dan nilai odds ratio sebesar 1,143. Kesimpulan: Terdapat hubungan signifikan antara kebiasaan merokok anggota keluarga dengan kejadian pneumonia pada balita dengan risiko 1,1 kali lebih tinggi mengalami pneumonia. Saran: Dapat dijadikan dasar edukasi di institusi pendidikan dan puskesmas, serta meningkatkan kesadaran masyarakat akan bahaya asap rokok terhadap kesehatan balita.

Kata kunci: Pneumonia, Balita, Kebiasaan Merokok, Keluarga, Asap Rokok

Article Information
Article History:
Submitted: 24 Januari 2026
Accepted: 27 Januari 2026
Publish Online: 27 Januari
2026

INTRODUCTION

Pneumonia is a form of acute respiratory infection that affects the lungs. The lungs are made up of tiny 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 restricting oxygen intake (Organization, 2022). Pneumonia in toddlers is a lung infection that can cause inflammation and fluid filling in the air sacs, making breathing difficult. Symptoms include coughing, fever, and difficulty breathing. Toddlers are vulnerable to pneumonia because their immune systems are immature. This infection can be caused by bacteria, viruses, or fungi, and environmental factors such as exposure to cigarette smoke can exacerbate the risk. Prompt treatment and prevention through a clean environment and appropriate immunizations are crucial to protecting toddlers' health and preventing serious complications.

According to UNICEF (2023), pneumonia remains the leading cause of infant mortality worldwide, with more than 700,000 children under the age of five dying annually from the disease. In Indonesia, the Ministry of Health recorded approximately 997,304 cases of pneumonia in infants throughout 2022. In East Java Province alone, 55,571 cases were recorded in 2023, and Kediri Regency recorded around 1,208 cases. One area with a high number of cases is the Semen Community Health Center, which ranks 9th out of 37 community health centers in Kediri, with 144 cases of pneumonia in infants, including 26 cases in Sidomulyo Village during January–September 2024.

Several previous studies have shown a significant relationship between family members' smoking habits and the incidence of pneumonia in toddlers. A study conducted by (Nugraha, 2024) in the Talaga Community Health Center (UPTD) work area in Majalengka Regency showed that toddlers who experienced pneumonia were higher in family members who smoked inside the house compared to family members who smoked outside the house, with the number of toddlers with pneumonia being (57.1%) and the results showed a value (p -value = 0,002).

(Astini et al., 2020) at Wangaya Regional Hospital found a relationship between parental smoking status, number of cigarettes, and duration of smoking with the incidence of pneumonia in toddlers, with a p value = 0.024 and OR = 19.00. (Wahyuni, 2020) added that exposure to cigarette smoke that sticks to parents' clothes can also cause pneumonia even if smoking is done outside the home (p = 0.016).

Based on these facts, this study was conducted to determine the relationship between smoking habits of family members and the incidence of pneumonia in toddlers aged 1–5 years in Sidomulyo Village, Semen District, as an effort to understand risk factors and encourage disease prevention through behavioral changes at the family level.

METHODS

This research uses a quantitative method with a correlation study design and a descriptive approach. Case-control to analyze the relationship between two variables, namely

family members' smoking habits and the incidence of pneumonia. The research location was in Sidomulyo Village, Semen District, Kediri in February 2025. The research population consisted of toddlers aged 1-5 years, both toddlers with a history of pneumonia and toddlers without a history of pneumonia, who live in Sidomulyo Village and are recorded in the medical records of the Semen Health Center with a sample of 34 respondents. The sampling technique was Purposive sampling. The sample was obtained from a target group or group that met the criteria determined by the researcher. The independent variable in this study was smoking habits, classified as infrequent, frequent, and always smoking. Meanwhile, the dependent variable was the incidence of pneumonia, classified as pneumonia and non-pneumonia.

Data collection was conducted by distributing questionnaires that measured the smoking habits of family members. Data analysis included: editing, coding, scoring, and tabulation before being tested using univariate and bivariate analysis. Statistical tests Chi-square used to test the relationship between independent and dependent variables with a significance level of 95% ($p < 0.05$). If the results show a value ($p < 0.05$), then there is a relationship between family members' smoking habits and the incidence of pneumonia in toddlers aged 1-5 years, whereas if $p > 0.05$, then there is no significant relationship.

RESULTS

The sample in this study was 34 respondents who were toddlers aged 1-5 years who lived in Sidomulyo Village, recorded in the medical records of the Semen Health Center.

Table 1. Respondent Characteristics Data

Pneumonia Incident	f	%
No Pneumonia	17	50%
Pneumonia	17	50%
Total	34	100%

Data source: Personal

Based on the analysis results in the table above, it shows that half of the respondents, namely 17 (50%) toddlers, experienced pneumonia.

Table 2. Frequency Distribution of Age Categories of Family Members Who Smoke in Sidomulyo Semen Village

Smoking Habit	f	%
Seldom	11	32,4%
Often	10	29,4%
Always	13	38,2%
Total	34	100%

Data source: Personal

Based on table 2, of the 34 respondents in Sidomulyo Village, it shows that almost half of the respondents 13 (38.2%) have a smoking habit in the always category.

Table 3. Frequency Distribution of Age Categories of Family Members Who Smoke in Sidomulyo Semen Village

Parents' Age	f	%
Late Adulthood (36-45 Years)	7	20,6%
Early Adulthood (26-35 Years)	21	61,8%
Late Elderly (56-65 Years)	1	2,9%
Early Elderly (46-55 Years)	1	2,9%
Late Adolescence (17-25 Years)	4	11,8%
Total	34	100%

Data source: Personal

Based on the analysis results in table 3, it shows that half of the respondents are in early adulthood (26-35) with a total of 21 (61.8%) respondents.

Table 4. Frequency Distribution of Personal Hygiene Smoking Habits of Family Members in Sidomulyo Semen Village

Personal Hygiene	f	%
Not enough	14	41,2%
Enough	13	38,2%
Good	7	20,6%
Total	34	100%

Data source: Personal

Based on the analysis results in the table above, it shows that almost half of the respondents have poor personal hygiene, namely 14 (41.2) respondents.

Bivariate Analysis

Table 5. Relationship between Family Members' Smoking Habits and the Incidence of Pneumonia in Toddlers Aged 1-5 Years in Sidomulyo Semen Village

Smoking habits	Pneumonia				Total	OR 95% CI	P-value (Pearson Chi-square)		
	Control		Case					N	%
	f	%	f	%					
Rare	8	23.5%	3	8.9%	11	32.4%	1.143 0.006		
Common	7	20.6%	3	8.9%	10	29.4%			
Always	2	5.9%	11	32.2%	13	38.2%			
Total	17	50%	17	50%	34	100%			

Data source: Personal

Based on the test Chi-Square In the table above, it shows that the smoking habits of family members and the incidence of pneumonia in toddlers are related to the value p-value 0.006 ($p < 0.05$) and the value odds ratio (OR) of 1,143.

DISCUSSION

Pneumonia Incident

A study of 34 respondents showed that half of the 17 (50%) toddlers had pneumonia. Based on a simple classification, a prevalence rate of 50% is considered high and indicates that pneumonia is a significant health problem in Sidomulyo Semen Village.

According to research conducted (Suci, 2020), pneumonia in children is an acute lower respiratory tract infection which is generally caused by bacteria such as *Streptococcus pneumoniae* and *Haemophilus influenzae*, with major risk factors including malnutrition, lack of immunization, and exposure to cigarette smoke and air pollution, so preventive efforts are needed through immunization and improving the quality of the environment and children's nutrition. Research (Faisal et al., 2024) also states that pneumonia is the leading cause of infant mortality globally and nationally. In Indonesia, mortality from pneumonia remains high. Risk factors that play a role include poor nutrition, low birth weight (LBW), lack of breastfeeding, low maternal education, crowded environments, and exposure to indoor smoke. The etiology of pneumonia is mostly bacterial and viral, and prevention efforts rely heavily on complete immunization, improved nutrition, and education for parents about hygiene and early detection of symptoms.

According to researchers, the high pneumonia prevalence rate of 50% in Sidomulyo Village indicates that the health of toddlers in the Sidomulyo area remains very concerning. This indicates the need for serious intervention from various parties, both government and community, particularly in terms of increasing immunization coverage, improving nutrition, and controlling environmental factors such as cigarette smoke and air pollution. Prevention must be the primary focus to reduce the incidence of pneumonia and allow toddlers to grow up healthy.

Smoking Habits of Family Members

Univariate analysis results showed that 13 respondents (38.2%) in Sidomulyo Village were active smokers, with the majority coming from the early adulthood age group (26–35 years) as many as 21 people (61.8%). This age is known as a productive phase that is vulnerable to stress and social environmental influences, which often encourage smoking behavior. In addition, as many as 14 respondents (41.2%) had poor personal hygiene. The combination of smoking habits and poor personal hygiene creates unhealthy household conditions, especially for toddlers who have immature respiratory systems and are susceptible to infections such as pneumonia.

Research conducted by (Fitrianingsih et al., 2021) shows that toddlers living with smokers have a 9.831 times higher risk of developing pneumonia, while households without PHBS have a 2.88 times greater risk. Similar findings by (Permatasari et al., 2023) state that a father's smoking history increases the risk of severe pneumonia in children by up to 10.5 times, and is generally accompanied by low awareness of hygiene after smoking. Furthermore, (Sitepu et al., 2024) add that although early adulthood tends to have good health knowledge, not all individuals are able to consistently implement healthy behaviors.

Researchers believe that smoking, productive age, and poor personal hygiene are a significant combination of risk factors for pneumonia in toddlers. Young adults should be the

primary target of health education because they play a crucial role in the family. Therefore, interventions should focus on raising awareness about the dangers of smoking in the home and the importance of adopting a clean and healthy lifestyle to protect children from respiratory infections.

The Relationship Between Family Members' Smoking Habits and the Incidence of Pneumonia

Based on the results of research conducted by researchers, there is a significant relationship between family members' smoking habits and the incidence of pneumonia in toddlers. The Chi-square test produced a significance value of 0.006 ($p < 0.05$), which indicates that exposure to cigarette smoke in the household has a significant contribution to the incidence of pneumonia. The Odds Ratio (OR) value of 1.143 indicates that toddlers living in a smoking family environment have a 1.1 times higher risk of developing pneumonia compared to toddlers living in a smoke-free environment. Exposure to cigarette smoke in the home, especially when it occurs regularly and in closed spaces, has the potential to damage the developing lung tissue in toddlers and increase the risk of lower respiratory tract infections, including pneumonia.

These findings align with research conducted by (Wardani et al., 2022) which found that almost all toddlers exposed to cigarette smoke from family members experienced pneumonia, with a prevalence of 99.3%. Furthermore, the study also identified that toddlers who were not exclusively breastfed had a high risk of developing pneumonia, with a prevalence of 98.6%. Environmental factors, nutritional status, and smoking behavior around toddlers were the main contributors to the high incidence of pneumonia. Another study by (Ni Putu Kurnia Safitri, 2025) conducted at the Narmada Community Health Center, West Lombok, supported these findings, showing a significant relationship between cigarette smoke exposure and the incidence of pneumonia in toddlers. The study reported a significance value of $p = 0.001$ and a prevalence ratio (PR) of 2.449, meaning toddlers exposed to cigarette smoke had a 2.4 times higher risk of developing pneumonia compared to those not exposed. The biological mechanisms involved include impaired airway cilia function, decreased immunity, and increased inflammatory reactions due to respiratory tract irritation by harmful particles in cigarette smoke. According to research conducted by (Rajagukguk et al., 2021), exposure to cigarette smoke indoors significantly increases the risk of pneumonia in toddlers. Of the 13 journals reviewed, 66% showed a significant association between cigarette smoke exposure and pneumonia. Harmful substances in cigarette smoke trigger inflammation, oxidative stress, and respiratory tract damage, making toddlers more susceptible to lung infections. Meanwhile, research by (Stefani & Setiawan, 2021) showed that the presence of smokers in the home, especially two or more, increases the risk of severe pneumonia in toddlers by up to 75-fold compared to homes without smokers. Indoor smoking and overcrowding also exacerbate

exposure, making children passive smokers highly susceptible to lower respiratory tract disorders.

According to researchers, these results consistently reinforce the fact that indoor smoking among family members is one of the most serious risk factors for pneumonia in toddlers. Toddlers have immature respiratory systems and suboptimal immune systems, making them highly vulnerable to the harmful effects of secondhand smoke exposure. This risk arises not only from occasional exposure but also increases with the number of smokers in the household, the frequency of smoking, and the density of housing, which worsens indoor air quality. Even the presence of one smoker in the home is enough to significantly increase the risk of pneumonia. Therefore, public health interventions need to focus on education about the dangers of indoor smoking, the importance of exclusive breastfeeding, and improving toddler nutrition as an integrated preventative measure. Creating a smoke-free home environment is fundamental to reducing pneumonia rates and protecting children's health sustainably.

CONCLUSION

The results of the study showed that half of the 17 (50%) respondents had pneumonia and almost half of the respondents 13 (38.2%) family members had a smoking habit in the always category. The results of the statistical test Chi-square showed a significant relationship between the smoking habits of family members and the incidence of pneumonia in toddlers with a p-value of 0.006 ($p < 0.05$). Odds ratio (OR) of 1.143 shows that toddlers who live in a family environment where smokers have a 1.1 times higher risk of developing pneumonia than those who live in a non-smoking environment.

REFERENCES

- Astini, P. S. N., Gupta, R. A., Suntari, N. L. P. Y., & Surinati, I. D. A. K. (2020). Hubungan Kebiasaan Merokok Orang Tua dengan Kejadian Pneumonia Pada Balita. *Jurnal Gema Keperawatan*, 13(2), 77–86.
- Faisal, F., Irwandi, Aprilia, R., Suharni, & Efriza. (2024). Tinjauan Literatur: Faktor Risiko dan Epidemiologi Pneumonia pada Balita. *Scientific Journal*, 3(3), 166–173.
- Fitrianingsih, N., Huriah, T., & Muryati, S. (2021). Hubungan Antara Perilaku Hidup Bersih Dan Sehat Dengan Kejadian Pneumonia Pada Balita Di Wilayah Kerja Puskesmas Mlati II Yogyakarta. *Jurnal Universitas Muhammadiyah Yogyakarta*, 7(April), 72–78.
- Ni Putu Kurnia Safitri, dkk. (2025). Hubungan Paparan Asap Rokok, Status Gizi Dan Status Imunisasi Campak Dengan Kejadian Pneumonia Pada Balita Di Puskesmas Narmada. 10(2), 1553–1567.

- Nuniek Tri Wahyuni, Heni Fa'riatul Aeni, M. A. (2020). Correlation between smoking habits at home and the incident of pneumonia among children aged 1-4 years. *Jurnal SMART Kebidanan*, 7(2), 108–113.
- Organization, W. H. (WHO). (2022). pneumonia paada anak-anak. <https://www.who.int/news-room/fact-sheets/detail/pneumonia>
- Rajagukguk, M., Simanungkalit, A., & Situmorang, N. M. (2021). Hubungan Keadaan Lingkungan Dengan Kejadian Infeksi Saluran Pernafasan Akut (Pneumonia) pada Balita. *Viva Medika*, 15(1), 102–118.
- Sheilla Intan Permatasari, Dasti Anditjarina, Deny Sutrisna Wiatma, S. (2023). Hubungan Tingkat Pengetahuan Ibu Dan Riwayat Merokok Ayah Dengan Tingkat Keparahan Pneumonia Pada Balita Di RSUD Kabupaten Klungkung. 05(01), 183–195.
- Sitepu, D. E., Primadiamanti, A., & Safitri, E. I. (2024). Hubungan Usia, Pekerjaan dan Pendidikan Pasien Terhadap Tingkat Pengetahuan DAGUSIBU di Puskesmas Wilayah Lampung Tengah. *Jurnal Ilmiah Wahana Pendidikan*, 10(6), 196–204.
- Stefani, M., & Setiawan, A. (2021). Hubungan Asap Rokok terhadap Derajat Keparahan Pneumonia Anak Usia di Bawah 5 Tahun. *Sari Pediatri*, 23(4), 235.
- Suci, L. N. (2020). Pendekatan Diagnosis dan Tata Laksana Pneumonia pada Anak. *Jurnal Kedokteran Nanggroe Medika*, 3(1), 30–38.
- UNICEF. (2023). Radang Paru-Paru.
- Wardani, N. L. P. D. W., Rismawan, M., & Darmayanti, P. A. R. (2022). Hubungan Pemberian ASI Eksklusif Dan Perilaku Merokok Keluarga Dengan Kejadian Pneumonia. 7(1), 13–19