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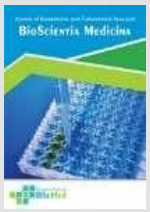

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# Risk Factors Related to Pneumonia in Toddlers in the Jeuram Health Center Work Area, Nagan Raya Aceh Regency

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**A B S T R A C T**

**Background:** Pneumonia has several risk factors, including low exclusive breastfeeding for infants, immunization status, smoking parents, and mother's level of knowledge related to pneumonia. This study aims to analyze the relationship between risk factors and pneumonia in toddlers in the work area of the Jeuram Health Center, Seunagan District, Nagan Raya Regency. **Methods:** This research is an observational study with a cross-sectional design. The participants in this study were all mothers with toddlers in the working area of the Jeuram Health Center, with a total sample of 99 mothers. The sampling technique used was total sampling. Data analysis using SPSS. **Results:** Based on the results of statistical tests, it was concluded that the factors related to the incidence of pneumonia in toddlers in the working area of the Jeuram Health Center, Nagan Raya Regency, namely knowledge (p-value 0.017), immunization status (p-value 0.041), exposure to cigarette smoke (p-value 0.033). **Conclusion:** Knowledge, immunization status, and exposure to cigarette smoke are associated with the incidence of pneumonia in toddlers.

## 1. Introduction

Pneumonia is an acute respiratory infection that adversely affects the lungs caused by viruses, bacteria, or fungi. This infection is generally spread by someone who is exposed to the environment where they live or has direct contact with infected people, usually through hands or inhaling water droplets in the air (droplets) due to coughing or sneezing.[1]

The incidence of pneumonia infection in toddlers in Indonesia ranges from 20-to 30% from 2010 to 2014. From 2015 to 2019, there was an increase in pneumonia infections in toddlers. However, in 2020 there was a decline again to 34.8%. This is due to the impact of the COVID-19 pandemic, where there is a stigma on people with COVID-19, which has an effect on reducing the number of visits for toddlers with coughing or difficulty breathing at the Health Center.[2]

In Indonesia, acute respiratory infection (ARI) is a disease that often occurs in children. Episodes of cough and cold in toddlers in Indonesia are estimated at 4 to 8 times per year. As a group of diseases, ARI is also one of the main causes of patient visits to

health facilities. As many as 40-60% of visits for treatment at the Health Center and 15-30% of visits for treatment in the outpatient and inpatient departments of hospitals are caused by ARI.[3]

Many factors contribute to the incidence of pneumonia. There are 3 simple but effective interventions, if implemented properly, that can reduce the burden of this disease. Steps that can be taken care of in the form of protection, prevention, and treatment. The protection factor is through exclusive breastfeeding for 6 months and continued with the provision of nutritious solid supplementary food until the age of 2 years. Prevention of pneumonia through whooping cough/pertussis, measles, Hib, and pneumococcal vaccinations. Clean and healthy living behavior, especially washing hands with soap (CTPS) and applying correct cough etiquette. Treatment of pneumonia includes eliminating air pollution, especially indoors, early detection, and adequate treatment of pneumonia.[4,5]

Pneumonia has risk factors such as malnutrition, lack of exclusive breastfeeding, incomplete measles immunization, premature birth, low family economic status, comorbid conditions, unaffordable access to health services, population density, bringing children to the kitchen while cooking, and status malnutrition.[6-7] Based on data from the Banda Aceh City Health Office, the prevalence of acute respiratory infections (ARI) in 2012 was 50.91% and in 2013 was 47.8%, the first highest number of 10 types of infectious diseases.[8] The working area of UPT Jeuram Health Center, Seunagan Subdistrict, Nagan Raya Regency is an area with pneumonia sufferers under five which has increased in the last three years. The number of cases increased from 43 cases/932 toddlers in 2018 to 68 cases from the total number of toddlers in 2020.[9]

Based on data from the Nagan Raya District Health Office, the working area of Jeuram Health Center is a health center that has not met the basic immunization coverage. Immunization coverage in 2020 in the Jeuram Health Center working area showed the following results: BCG (85 %), DPT-HBHib 3 (87 %), polio (82 %), and measles (78 %). From this data, the coverage is still below the MDGs target of 93%.[9] Besides that, in the working area of the Jeuram Health Center, the level of immunization coverage is still low compared to other areas. This is because the level of knowledge of mothers in this area is still lacking on the importance of immunization.[9] This study aims to evaluate the risk associated with pneumonia in toddlers in the Jeuram Public Health Center, Banda Aceh.

## 2. Methods

This research is an observational study with a cross-sectional design. The population in this study were all mothers who had toddlers in the working area of the Jeuram Health Center, with as many as 99 mothers with toddlers. The determination of the research sample was carried out by total sampling, that is, the entire population became the research sample.

This research was conducted in October-November 2021 at the Jeuram Health Center, Seunagan District, Nagan Raya Regency. Data was collected using a questionnaire. Prior to participating in the study, all respondents had informed consent and signed an agreement to participate in the study. This study has been approved by the local ethical committee in Health Polytechnic-Ministry of Health, Banda Aceh, Indonesia. The data were analyzed using SPSS software for windows version 22.0.

## 3. Results

Table 1 shows the characteristics of research respondents based on age, education, and occupation. Most of the respondents are 30-40 years old (44.4%), have a high school education (53.5%), and are active as housewives (36.4%). Meanwhile, the mother's level of knowledge related to pneumonia was lacking (60.6%), the incomplete immunization status of toddlers (63.6%), most of the toddlers had smoking parents (69.7%), and the incidence of pneumonia in toddlers was 45.5% (Table 2).

Table 1. Frequency distribution of respondent characteristics.

| No. | Characteristics | Frequency (%) |
|---|---|---|
| 1 | Age | |
| | 24-29 Years | 32 (32.3%) |
| | 30-40 Years | 44 (44.4%) |
| | 41-50 Years | 23 (23.3%) |
| 2 | Education | |
| | Higher | 22 (22.2%) |
| | Secondary | 53 (53.5%) |
| | Elementary | 24 (24.3%) |
| 3 | Occupation | |
| | Housewives | 36 (36.4%) |
| | Civil servant | 30 (30.3%) |
| | Private | 33 (33.3%) |

Table 2. Distribution of risk factors and incidence of pneumonia in toddlers.

| No. | Characteristics | Frequency (%) |
|---|---|---|
| 1 | Knowledge | |
| | Good | 60 (60.6%) |
| | Poor | 39 (39.4%) |
| 2 | Immunization status | |
| | Complete | 36 (36.4%) |
| | Incomplete | 63 (63.6%) |
| 3 | Smoking parents | |
| | No | 69 (69.7%) |
| | Yes | 30 (30.3%) |
| 4 | Pneumonia incidence | |
| | No | 54 (54.5%) |
| | Yes | 45 (45.5%) |

The results of data analysis showed that toddlers who had pneumonia were higher in infants whose mothers had poor knowledge (61.5%). There is a relationship between knowledge and the incidence of pneumonia in toddlers in the Jeuram Health Center, Nagan Raya Regency (p=0.017). Toddlers who experienced pneumonia were higher in infants with incomplete immunization status (54.0%), and there was a relationship between immunization status and the incidence of pneumonia in toddlers (p=0.041). Meanwhile, the incidence of pneumonia is more experienced by toddlers with smoking parents (63.3%). The results of statistical tests showed that there was a relationship between smoking parents and the incidence of pneumonia in toddlers in the Jeuram Public Health Center, Nagan Raya Regency (p=0.033) (Table 3).

Table 3. Relationship between knowledge and the incidence of pneumonia in toddlers

| No. | Factor | Pneumonia | | | | Total | | p-value |
|---|---|---|---|---|---|---|---|---|
| | | No | | Yes | | | | |
| | | f | % | f | % | f | % | |
| 1 | Knowledge | | | | | | | |
| | Good | 39 | 65.0 | 21 | 35.0 | 60 | 100 | 0.017 |
| | Not good | 15 | 38.5 | 24 | 61.5 | 39 | 100 | |
| 2 | Immunization status | | | | | | | |
| | Complete | 25 | 69.4 | 11 | 30.6 | 36 | 100 | 0.041 |
| | Incomplete | 29 | 46.0 | 34 | 54.0 | 63 | 100 | |
| 3 | Smoking parents | | | | | | | |
| | No | 43 | 62.3 | 26 | 37.7 | 69 | 100 | 0.033 |
| | Yes | 11 | 36.7 | 19 | 63,3 | 30 | 100 | |

## 4. Discussion

The results of this study indicate that there is a relationship between knowledge of pneumonia prevention and the incidence of pneumonia in toddlers (p=0.017). Toddlers who have pneumonia are higher than toddlers whose mothers have less knowledge. This study is in line with research conducted at the Bahu Health Center in Manado City, which showed that there was a relationship between the level of knowledge and the incidence of pneumonia in toddlers.[5] Mothers who have good knowledge tend to show good pneumonia prevention behavior, while mothers who have sufficient knowledge and less tend to show sufficient pneumonia prevention behavior.[10] Through knowledge, humans can make qualitative changes to individuals so that their behavior develops.[11-13]

The results of this study indicate that there is a relationship between basic immunization status and the incidence of pneumonia in toddlers (p=0.041). Toddlers who have pneumonia are higher in children who are not complete with basic immunizations compared to toddlers who are complete with basic immunizations. Another study showed that there was a relationship between complete immunization status and the incidence of pneumonia in toddlers.[14-15] Immunization status is expected to prevent worsening if the toddler has pneumonia. The immunization that has been proven to be effective in preventing pneumonia is the measles and pertussis (DPT) immunization. Death and complications due to pneumonia in toddlers due to pneumonia can be prevented by giving DPT immunization.[16] The more complete the immunization status, the lower the risk of developing preventable diseases.[17]

The results of this study indicate that there is a relationship between smoking parents and the incidence of pneumonia in toddlers (p = 0.003). Toddlers who experience pneumonia are higher in toddlers whose parents smoke compared to toddlers whose parents do not smoke. This study is in line with research conducted at the Wangaya Hospital, which showed that there was a relationship between the type of smoker and the incidence of pneumonia in toddlers.[18] Likewise with other studies that show there is a relationship between parental smoking behavior and pneumonia in children in Malang City.[19]

However, this study is not in line with research conducted at three health facilities in the Kilimanjaro area, which showed no association between smoking parents and pneumonia in children. This is probably due to the high immunization coverage in the population. In addition, with this high vaccine coverage, herd immunity is possible for unvaccinated children.[20] Exposure to the smell of tobacco smoke in infants and toddlers is a risk factor for causing pneumonia.[21] Continuous and prolonged exposure to polluted air causes disruption of lung alveolar macrophages and epithelial cells.[22]

## 5. Conclusion

Factors related to pneumonia in toddlers in the Jeuram Public Health Center, Nagan Raya Regency, namely knowledge, immunization status, and smoking

parents. It is expected that mothers who have toddlers will increase their health knowledge in an effort to prevent pneumonia and provide complete basic immunizations to their children. In addition, parents are expected not to smoke in the house and around toddlers.

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