

## Profile of toddler pneumonia cases in Soewandhie Regional Hospital, Surabaya, East Java, Indonesia: A descriptive study

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World Journal of Advanced Research and Reviews, 2024, 22(02), 558–563

Publication history: Received on 26 March 2024; revised on 02 May 2024; accepted on 04 May 2024

Article DOI: <https://doi.org/10.30574/wjarr.2024.22.2.1377>

### Abstract

**Introduction:** Pneumonia stands as a leading cause of mortality among children under five, trailing only behind diarrhea in Indonesia, where it has claimed the lives of 740,180 young children. This study endeavors to provide a comprehensive overview of toddler pneumonia specifically within the confines of Soewandhie Regional Hospital, Surabaya, East Java, Indonesia.

**Objective:** The primary objective of this research is to gain insight into the prevalence and characteristics of toddler pneumonia cases at Soewandhie Regional Hospital, Surabaya, East Java, Indonesia.

**Method:** Employing descriptive quantitative methods with a cross-sectional design, the study recruited a sample of 35 toddlers meeting predefined inclusion and exclusion criteria through consecutive sampling. Data collection occurred within the Seruni room at Soewandhie Hospital, utilizing a combination of medical records examination and interviews with the families of the toddlers.

**Result:** Among the sampled toddlers, a significant majority (65.7%) were diagnosed with pneumonia. Analysis revealed that a notable portion (51.4%) fell within the age range of 12-23 months, with a slight majority being female (54.3%). Maternal ages predominantly ranged from 20 to 35 years, while paternal ages were concentrated between 25 and 40 years (28.6%). Moreover, 17.1% of the toddlers had previously experienced pneumonia, and a majority (82.9%) were born at term with normal body weights (91.4%). Notably, two toddlers lacked complete parental care due to parental death.

**Conclusion:** The findings underscore the significant burden of pneumonia among toddlers at Soewandhie Hospital. Future research endeavors could benefit from expanding the sample size and investigating additional factors contributing to toddler pneumonia incidence.

**Keywords:** Pneumonia; Toddler; Maternal age; Paternal age; Previous pneumonia; Child health

### 1. Introduction

Toddlers are a group of individuals who are vulnerable to infectious diseases because their immune system is not yet fully developed. A person is categorized as a toddler if they are 12-59 months old (1). Toddlers have immature immune systems. Therefore, toddlers are easily attacked by diseases, one of which is pneumonia. Pneumonia is a disease that attacks the lungs due to infection from viruses, bacteria or fungi (2). Pneumonia causes the alveoli to become inflamed, characterized by fluid or pus which can cause problems with the respiratory system (3). Based on data from (3), pneumonia causes death in 740,180 children under five in the world. Meanwhile, in Indonesia pneumonia is the second

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largest cause of death among children under five. East Java is the province with the highest number of cases in Indonesia (4). Meanwhile, in the city of Surabaya there were 12,888 cases of pneumonia, of which 154 cases were in the severe category (5). Pneumonia can be classified into 2 categories according to WHO (2014), namely pneumonia and severe pneumonia. It is said to be pneumonia if a toddler's RR is  $\geq 40$  times/minute and there is inward chest pulling. Meanwhile, severe pneumonia has the same characteristics as pneumonia followed by other danger signs, such as seizures, inability to eat and drink, respiratory distress, cyanosis, and SpO<sub>2</sub> <90% (6).

There are various factors that influence the occurrence of pneumonia in toddlers, such as basic immunization status, history of exclusive breastfeeding, exposure to cigarette smoke, type of wall, type of floor, and many others. Based on the characteristics of toddlers, there are various factors that influence pneumonia, namely age, gender, LBW, immunization status, and history of exclusive breastfeeding (7). The characteristics of toddlers play an important role in the incidence of pneumonia because these characteristics determine the toddler's immune system. In addition, based on maternal factors, such as gestational age, occupation and education are predictors of pneumonia in toddlers (7). These maternal factors are important for evaluating the toddler's immune system and the ability or knowledge of the toddler's parents in preventing pneumonia in toddlers. Based on the environment, there are several factors that trigger pneumonia in toddlers, namely family smoking habits, wall type, floor type, ventilation, residential density, use of insecticides, and cooking fuel (8). The environment can influence a person's level of health, especially resistance to disease. The environment is one of the supporting factors for health problems. Unsuitable environmental conditions can increase opportunities for disease-causing microorganisms to grow and develop massively. Soewandhie Hospital is a hospital owned by the Surabaya City government and is one of the referral hospitals for treating infectious diseases, such as pneumonia. Based on these things, this research was created with the aim of exploring an overview of pneumonia in toddlers at Soewandhie Regional Hospital, Surabaya.

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## 2. Material and methods

The research method used is a descriptive survey research method. The aim is to explore the picture of pneumonia in toddlers at Soewandhie Hospital, Surabaya. The research was conducted in the children's care room at Soewandhie Hospital in October-November 2023. The population used was toddlers with pneumonia at Soewandhie Hospital, Surabaya. Meanwhile, the sample size obtained was 35 toddlers with pneumonia who were taken using this technique consecutive sampling. The survey was conducted using medical records and questionnaires. The research was conducted with due regard to patient privacy and ethical clearance. The collected data is presented in the form of a frequency distribution.

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## 3. Results and discussion

Based on table 1, it is found that the largest age range for the sample is age 12-23 months as many as 18 samples (51.4%), more than half of the samples (54.3%) were female, the mother's age was mostly in the range 20-35 years and the father's age was in the range 25-40 years (28.6 %), as many as 6 toddlers (17.1%) had experienced pneumonia before, and most of the samples were born at term (82.9%) with normal body weight (91.4%), and body length at birth of 49 or 50 cm (25.7%). At the time of data collection, it was found that 2 toddlers did not have complete parents, 1 toddler's father had died and the other's parents had both died.

### 3.1. Characteristics of Toddler Pneumonia

#### 3.1.1. Toddler age

Research conducted on 35 respondents under five with pneumonia at Soewandhie Regional Hospital found that the majority of toddlers were aged 12-23 months (51.4%). These results are in line with research which found that 50.56% of toddlers who experienced pneumonia were in the age range 13-24 months (9). Younger people have a higher risk of developing infectious diseases. This is because the immune system of younger babies is not yet fully developed.

#### 3.1.2. Gender

This research showed that 19 toddlers (54.3%) who experienced pneumonia were female. This is different from Dewi's (2023) research which found that 59.3% of toddlers who experienced pneumonia were male (10). Meanwhile, research by Jannah (2020) found that 50.7% of toddlers with pneumonia were female (11). In research from A'yuni (2022), it was found that 34 of 62 toddlers (54.8%) were boys (12).

**Table 1** Characteristics of Toddler Pneumonia at Soewandhie Regional Hospital

No	Respondent Characteristic	Criteria	Frequency (f)	Percentage (%)
1	Toddler age (month)	12-23	18	51.4
		24-35	11	31.4
		36-59	6	17.1
		Total	35	100
2	Gender	Female	19	54.3
		Male	16	45.7
		Total	35	100
3	Mother age (year)	20-35	22	62.9
		>35	12	34.3
		Death	1	2.8
		Total	35	100
4	Father age (year)	<25	2	5.7
		25-40	25	71.4
		>40	6	17.1
		Death	2	5.7
	Total	35	100	
5	Gestational age	Aterm	29	82.9
		Preterm	4	11.4
		Postdate	2	5.7
		Total	35	100
6	Birth weight	Not LBW	32	91.4
		LBW	3	8,6
		Total	35	100
7	History of Pneumonia	Not recurrent	29	82.9
		Recurrent	6	17.1
		Total	35	100

**Table 2** Frequency Distribution of Pneumonia Degrees in Toddlers

Information	Criteria	Frequency (f)	Percentage (%)
Pneumonia	Pneumonia	23	65.7
	Severe Pneumonia	12	34.3
	Total	35	100

### 3.1.3. Age of parents

This research found that 62.9% and 71.4% of parents of toddlers were of productive age. Age is an important factor in a person's maturity in thinking. Maturity of mind can influence a person's attitudes and behavior, especially health

behavior. A more mature age will produce more mature and specific thoughts regarding health behavior. In early adulthood, health behavior will be more specific, both in good and bad conditions (13).

#### 3.1.4. Gestational age

This study found that 82.9% were born at term. Meanwhile, 11.4% of toddlers were born preterm or premature. Premature birth is the birth of a baby or the end of a pregnancy at a gestational age <37 weeks and/or birth weight <2500 grams. Previous research showed that 62 of 253 toddlers with pneumonia were born preterm, or 24.5% (14).

#### 3.1.5. Birth weight

This study found that 3 out of 35 toddlers with pneumonia (8.6%) were born with LBW. LBW is a condition where the baby's weight at birth is less than 2500 grams. Meanwhile, in another study it was found that 71 of 253 toddlers who experienced pneumonia were born with LBW (14).

#### 3.1.6. History of pneumonia

The majority of toddlers who experienced pneumonia in the study were experiencing pneumonia for the first time, namely 82.9%. Meanwhile, previous research found that 45.3% of toddlers experienced recurrent pneumonia (15).

### 3.2. Overview of the Degrees of Pneumonia in Toddlers

The results of the research show that the majority of degrees of pneumonia in toddlers are in the pneumonia category with symptoms of RR  $\geq$ 40 times/minute and there is indrawing of the chest wall, namely 65.7%. Meanwhile, the other 34.3% of toddlers were classified as severe pneumonia. This is in line with research by Purnama which found 76.6% of toddlers in the pneumonia category (16). Based on this, it can be concluded that toddlers are more susceptible to diseases in the pneumonia category. The discovery of pneumonia can be found by looking respiratory rate based on recommendations from WHO. The WHO recommendation is the basis for diagnosing pneumonia which can be applied in limited health facilities because of its high sensitivity, easy access to services, and reasonable specificity. However, this examination is not an examination that can establish a definite diagnosis. Gold standard diagnosis of pneumonia is a radiological examination. Usually the findings obtained from radiological examination of toddlers with pneumonia include : alveolar or interstitial lung infiltrates. Alveolar infiltrates are characterized by dense or fine opacities in part or all of the lobes, even all parts of the lung, accompanied by air bronchogram or not. Meanwhile, the interstitial infiltrate has a linear and uneven density with a lacy pattern (17). Apart from that, the degree of pneumonia can also be determined based on laboratory results (18). There are many factors that influence the degree of pneumonia in toddlers. According to Kasundriya (2020), one of the risk factors for the degree of pneumonia in toddlers is age, place of residence, prematurity, low birth weight, parental education and parental occupation (19). Meanwhile, in Sutriana's (2021) research, the risk factors for pneumonia include : wasting, exclusive breastfeeding, basic immunization status, household air pollution, and low birth weight (20). According to the researchers' assumptions regarding the research results obtained, the degree of pneumonia in toddlers can be caused by many factors. Some of these factors can be observed during the research, including the toddler's age, parental age, gestational age at birth, and birth weight.

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## 4. Conclusion

The results showed that the age range of the largest sample was 12-23 months, 18 samples (51.4%), more than half of the sample (54.3%) were female, the mother's age was mostly in the range 20-35 years and age fathers in the range of 25-40 years (28.6%), as many as 6 toddlers (17.1%) had experienced pneumonia before, and most of the samples were born at term (82.9%) with normal body weight (91.4 %). At the time of data collection, it was found that 2 toddlers did not have complete parents, 1 toddler's father had died and the other's parents had both died. For the development of midwifery science, it is hoped that this research can be used as a source of new knowledge or information for midwifery science regarding the description of the degree of pneumonia in toddlers. For hospital services, it is hoped that this research can become a reference and source of information for health workers, especially midwives, to determine the degree of pneumonia that occurs in toddlers in the children's inpatient room at Soewandhie Hospital. For future research, it is hoped that this research will become a source of reference and initial data for further research, especially regarding the degree of pneumonia in toddlers at Soewandhie Hospital.

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## Compliance with ethical standards

### *Acknowledgments*

We the authors wish to acknowledge the contributions made by all those who contributed in one way or the other for the successful completion of this research.

### *Disclosure of conflict of interest*

There was no conflict of interest.

### *Statement of ethical approval*

Ethical clearance was approved by the Ethics Committee of the Soewandhie Regional Hospital, Surabaya, East Java, Indonesia Number 024/KE/KEPK/ 2023, on September 26, 2023.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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