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Overview of Pneumonia Prevention Efforts in Toddlers Aged 2–59 Months at the MTBS Polyclinic

Maryati Soplestuny[a] | **Harianti Fajar**[a]

[a]Department of Nursing, High School of Health Science Pasapua Ambon, Indonesia.

Abstract

Background: Pneumonia is one of the most common lung infections and a leading cause of death among children under five. One of the main causative agents is Streptococcus pneumoniae. Prevention of pneumonia can be carried out through simple interventions, particularly by parents, such as the implementation of clean and healthy living behaviors (PHBS). **Methods:** This study used a quantitative approach with a descriptive design. A total of 114 parents of toddlers aged 2–59 months who visited the MTBS (Integrated Management of Childhood Illness) polyclinic at Tawiri Community Health Center were selected using purposive sampling. **Results:** The results showed that more than half of the respondents (55.3%) did not practice proper handwashing with soap. Most of the children (98.2%) were exposed to poor household air quality, and the majority of respondents (93.9%) did not implement correct coughing etiquette. **Conclusion:** Pneumonia prevention efforts among toddlers aged 2–59 months at the MTBS polyclinic of Tawiri Community Health Center were not optimal. It is recommended that the health center intensify health education for parents and community health workers regarding pneumonia prevention in toddlers.

Keywords: Pneumonia, Toddlers, Prevention, PHBS, MTBS

1. Introduction

According to the World Health Organization (WHO, 2019), pneumonia is the single largest infectious cause of death in children worldwide, responsible for the deaths of 808,694 children under the age of five in 2017—equivalent to more than 2,500 deaths per day or approximately two deaths every minute. The Indonesian Pediatric Society (Ikatan Dokter Anak Indonesia, IDAI, 2017) referred to pneumonia as "The Forgotten Killer of Children" due to the common misperception that pneumonia is merely a regular flu. This disease frequently affects vulnerable groups such as infants and toddlers who have underdeveloped immune systems.

The incidence of pneumonia in developing countries is 2 to 10 times higher than in developed countries (Mardjandis, 2015). In developing regions, around 60% of pneumonia cases are caused by bacteria, while in developed countries, pneumonia is predominantly viral (Kemenkes, 2016). The Indonesian Ministry of Health (Kemenkes, 2019) reported that between 2015 and 2018, pneumonia case detection coverage improved due to a change in estimated case figures from 10% to 3.55%. Reporting coverage increased from 94.12% in 2016 to 97.30% in 2017 and reached 100% in 2018, indicating a steady increase in pneumonia case reporting nationwide.

In 2018, only one province—DKI Jakarta—achieved the pneumonia management target for children under five (95.53%), while the remaining provinces were below the national target of 80%. The lowest achievement was in Central Kalimantan (5.35%), and West Java ranked eighth at 58.80% (Kemenkes, 2018). The lowest district-level coverage was recorded in West Bandung at only 0.70% (Profil Kesehatan Provinsi Maluku, 2017). In the same year, the Tawiri Health Center managed and treated 77.64% of pneumonia cases among children under five (Dinkes Kota Ambon, 2018). Across the four sub-districts in Ambon City, Tawiri is among the highest in terms of pneumonia detection and management in toddlers.

Data from the MTBS (Integrated Management of Childhood Illness) Polyclinic at Tawiri Health Center indicated that, from January to December 2024, pneumonia ranked third among the top nine illnesses in children aged 2–59 months, with 171 cases (3.33%) out of a total of 1,135 visits. Acute rhinitis (744 cases or 33.96%) and dengue fever (745 cases or 33.98%) were ranked first and second, respectively. From January to August 2024, pneumonia cases reached 167 (4.62%) in the same age group, suggesting that the number is likely to rise in 2025 (Profil Data PKM Tawiri, 2024).

In 2015, the United Nations in New York adopted the Sustainable Development Goals (SDGs) for the 2015–2030 period, one of which targets the reduction of neonatal and under-five mortality by 2030 (Osborn, 2015). One of the strategic approaches to managing pneumonia is through the Integrated Management of Childhood Illness (MTBS) program (Khayati FN

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et al., 2015). Since 2021, the Indonesian government has set a target of 60% implementation of standard pneumonia diagnosis and treatment through MTBS at primary healthcare centers (Kemenkes, 2016). However, national results have not fully met these targets. In 2021, implementation reached only 14.62% (target: 20%), 28.07% in 2022 (target: 30%), and 43% in 2024 (target: 50%) (Riskesdas, 2024). Although there has been consistent annual improvement, the overall implementation rate remains below the 60% target.

A preliminary study conducted at the Tawiri Health Center on August 24, 2024, explored three components of pneumonia prevention: protection, prevention, and treatment. In the protection domain, 12 mothers of children diagnosed with pneumonia at the MTBS polyclinic confirmed that their babies were breastfed immediately after birth and exclusively for the first six months. Nutritional screening by MTBS staff revealed no signs of malnutrition. Nutritional assessments were conducted using growth monitoring cards (Kartu Menuju Sehat, KMS), and mothers received counseling from a nutritionist.

In terms of prevention, all toddlers diagnosed with pneumonia had received immunizations appropriate for their age, including vaccines for pertussis, measles, Hib, and PCV, as recorded in the KMS. Health promotion efforts regarding pneumonia were carried out once a year in five villages within the service area, funded by the Health Operational Assistance program, and attended by 25 participants. From interviews, 5 out of 12 mothers taught their children to wash hands with soap. However, 8 out of 12 reported covering sneezes with their palms and forgetting to wash their hands afterward due to being busy, instead wiping them with clothing or a cloth. If a child coughed for more than three days, mothers did not use masks. Furthermore, 11 of 12 respondents said their husbands smoked inside the house, 9 admitted to burning household waste due to a lack of public garbage disposal facilities, and 3 still used mosquito coils at night.

For treatment, MTBS healthcare workers followed the program's standard guidelines: toddlers diagnosed with pneumonia received antibiotics twice daily for three days, safe cough remedies, and instructions to return for follow-up after three days. If a cough lasted more than 14 days or if wheezing was present, the child was referred for further care (MTBS, 2024).

The pneumonia case trend at the Tawiri MTBS polyclinic shows a likely increase in 2024 and beyond. The quarterly reports already exceed the total cases from the previous year. Enhancing parental involvement in the protection, prevention, and treatment of pneumonia offers a low-cost and life-saving strategy for reducing child mortality (Kemenkes, 2019). Since prevention is the simplest form of intervention, it is essential to evaluate whether current programs at the Tawiri MTBS polyclinic are functioning effectively. Therefore, this study aims to describe pneumonia prevention efforts in toddlers aged 2–59 months at the MTBS Polyclinic of Tawiri Community Health Center, Maluku Province.

2. Materials and Methods

This study employed a quantitative method with a descriptive design. The approach used was cross-sectional. The research was conducted at the MTBS Polyclinic of Tawiri Community Health Center, located on Nuntati Street, Air Manis Hamlet, Laha Village, Ambon City. Data collection was carried out from the third week of December 2024 to the fourth week of January 2025. The population in this study consisted of parents of toddlers aged 2–59 months who were diagnosed with pneumonia or classified as having a cough that was not pneumonia, and who visited the MTBS Polyclinic at Tawiri Health Center. A non-probability sampling technique was used, specifically purposive sampling, to select respondents. The total sample size was 114 respondents. The research instrument used was a checklist-type questionnaire consisting of 20 statements.

3. Results

Tabel 1 menunjukkan distribusi frekuensi responden berdasarkan karakteristik demografi. Mayoritas responden berada pada kelompok usia dewasa akhir (36–45 tahun) sebanyak 34 responden (29,8%), diikuti oleh dewasa awal (26–35 tahun) sebanyak 29 responden (25,4%). Sebagian besar responden adalah ibu dari balita (97,4%), dengan tingkat pendidikan terbanyak pada jenjang SMA (43,8%).

Dari sisi pekerjaan, sebagian besar ayah bekerja sebagai buruh (33,3%) dan pedagang (26,3%), sementara ibu sebagian besar berstatus sebagai Ibu Rumah Tangga (90,4%). Pendapatan keluarga didominasi oleh kelompok dengan penghasilan di atas Upah Minimum Regional (UMR), yaitu sebesar 51,8%.

Dalam hal jenis kelamin balita, lebih banyak balita perempuan (57,9%) dibandingkan laki-laki (42,1%). Sebagian besar balita tergolong dalam kategori "Bukan Pneumonia" (88,6%), sementara hanya 11,4% tergolong "Pneumonia". Jumlah kunjungan balita ke fasilitas kesehatan paling banyak tercatat sebanyak dua kali (28,1%).

Table 1. Distribution of Respondent Frequencies Based on Demographic Characteristics

Demographic Characteristics	Frequency (f)	Presentation (%)
Age (Ministry of Health, 2013)		
Late Adolescence 17-25 Years	29	25.4
Early Adulthood 26-35 Years	49	43.0
Late Adulthood 36-45 Years	34	29.8
Elderly 45-55 Years	1	0.9
Late Elderly 56-65 Years	1	0.9
Family Relationships		
Mother	111	97.4
Grandmother	3	2.6
Education Level		
Elementary School	23	20.2
Junior High School	31	27.2
High School	50	43.8
University	10	8.8
Father's Employment Status		
Farmer	6	5.3
Laborer	38	33.3
Trader	30	26.3
Private Sector	27	23.7
Civil Servant	13	11.4
Mother's Employment Status		
Housewife	103	90.4
Trader	1	0.9
Private Sector	1	0.9
Civil Servant	9	7.9
Family Income		
Regional Minimum Wage	17	14.9
<Regional Minimum Wage	38	33.3
>Regional Minimum Wage	59	51.8
Infant Gender		
Male	48	42.1
Female	66	57.9
Pneumonia Categorization		
Pneumonia	13	11.4
Cough (Not Pneumonia)	101	88.6
Number of Visits		
1	18	15.8
2	32	28.1
3	33	28.9
4	19	16.7
5	5	4.4
6	5	4.4
7	1	.9
8	1	.9
Total	114	100.0

Table 2 Distribution of the Frequency of PHBS Prevention, Especially CTPS by Respondents at the Tawiri Health Center (n=114)

Category	Frequency	(%)
right	38	33.3
not right	76	66.7
Total	114	100

Table 2 shows that out of a total of 114 respondents at the Tawiri Health Center, only 33.3% carried out the prevention of Clean and Healthy Living Behavior (PHBS), especially Hand Washing with Soap (CTPS), appropriately. In contrast, the majority of respondents (66.7%) still have not performed CTPS actions correctly. This indicates that the level of compliance with PHBS practices, especially CTPS, is still low and needs to be improved through health education and more effective interventions.

Table 3. Distribusi Frekuensi Gambaran Pencegahan Responden Tentang Penurunan Asap dalam Ruangan di Puskesmas Tawiri (n=114)

Category	Frequency	(%)
Household smoke Good (no smoke generated)	2	1.8
Not good (there is smoke produced)	112	98.2
Total	114	100.0

Table 3 shows that most respondents (98.2%) still have poor household conditions in terms of indoor smoke control, where there is still smoke generated. Only 1.8% of respondents had smoke-free household conditions. These findings indicate that awareness or ability to manage ventilation and smoke sources in the home is still very low, so it has the potential to increase the risk of respiratory distress, especially in toddlers.

Table 4. Distribusi Frekuensi Gambaran Pencegahan Responden Tentang Etika Batuk di Puskesmas Tawiri (n=114)

Category	Frequency	(%)
True	7	6.1
Wrong	107	93.9
Total	114	100.0

Table 4 shows that only 6.1% of respondents have the correct understanding and application of cough etiquette, while the majority of respondents (93.9%) have not applied cough etiquette properly. This shows that public awareness in preventing the transmission of diseases through cough etiquette is still very low. Therefore, more intensive education efforts are needed regarding the importance of cough etiquette to prevent the spread of respiratory infections, especially in the family and community environment.

Table 5. Distribusi Frekuensi Hasil Gambaran Pencegahan Pneumonia pada Balita 2-59 Bulan di Puskesmas Tawiri (n=114)

Category	Frequency	(%)
Precise and effective	54	47.4
Inappropriate and ineffective	60	52.6
Total	114	100.0

Table 5 shows that as many as 54 respondents (47.4%) have made efforts to prevent pneumonia in toddlers appropriately and effectively. However, more than half of the respondents (52.6%) have not implemented pneumonia prevention correctly and effectively. This shows that there is still a need to increase public knowledge and awareness, especially parents of toddlers, regarding appropriate pneumonia prevention measures so that the risk of respiratory infections in children can be minimized.

4. Discussion

This study involved 114 respondents who answered 21 questionnaire items regarding parental perceptions of pneumonia prevention among children under five at Tawiri Public Health Center (Puskesmas), Ambon City. The demographic distribution of respondents is presented in Table 1, showing that the majority were mothers (97.4%) with the highest level of education being senior high school (43.8%), and most worked as housewives (90.4%). In terms of income, more than half (51.8%) earned above the regional minimum wage.

4.1. Prevention Through Clean and Healthy Living Behavior (PHBS), Especially Handwashing with Soap (CTPS)

As shown in Table 2, only 33.3% of respondents performed PHBS—specifically handwashing with soap—correctly, while 66.7% did not follow proper hand hygiene practices. Questionnaire analysis revealed that most respondents (64%) did not wash their hands correctly using running water and soap.

Handwashing is one of the simplest yet most effective actions for preventing respiratory infections, including pneumonia. Studies indicate that proper handwashing with soap can reduce the risk of acute respiratory infections by up to 50% (Rabie & Curtis, 2006; Wolf et al., 2018). In Indonesia, national surveys have shown that improper handwashing among caregivers significantly contributes to increased incidence of infectious diseases in children under five (Wulandari et al., 2024).

4.2. Prevention Through Reducing Indoor Air Pollution

Table 3 shows that nearly all respondents (98.2%) had poor indoor air quality, with significant household air pollution. Most respondents reported that their husbands (65.8%) or other household members (43.9%) smoked inside the house. Additionally, many still used mosquito coils (54.4%), burned trash in the yard (51%), or were exposed to smoke entering the home from such activities (48.2%).

Exposure to indoor air pollution, especially from cigarette smoke, biomass combustion, and mosquito coils, is a significant risk factor for pneumonia in children under five. According to WHO and UNICEF (2019), indoor air pollution contributes to more than half of all pneumonia deaths in this age group. A study by Sunyataningkamto et al. (2004) in Indonesia found that children exposed to household smoke were over 8 times more likely to suffer from pneumonia. Moreover, mosquito coils produce fine particulate matter and toxic chemicals, increasing respiratory infection risk (Chen et al., 2008; Mulyadi & Suhardi, 2023).

4.3. Prevention Through Proper Coughing Etiquette

Table 4 shows that only 6.1% of respondents followed correct coughing etiquette. Most did not cover their mouth with their sleeve (72.8%) or use a mask (53.5%), although many still covered their mouth with their hands (86.8%).

The WHO (2018) and Indonesian Ministry of Health emphasize the importance of covering one's mouth and nose with a tissue or upper sleeve—not hands—when coughing or sneezing, to reduce droplet transmission of respiratory pathogens. Poor coughing habits within households increase the risk of pneumonia and other respiratory infections spreading to children.

4.4. Overall Pneumonia Prevention Practices

As shown in Table 5, only 47.4% of respondents demonstrated accurate and effective pneumonia prevention practices, while 52.6% did not. This indicates a need for improved health education and behavioral change interventions.

Demographic data (Table 1) show most respondents were young to middle-aged adults, with many having completed high school. Higher maternal education levels are positively associated with better child health practices, including pneumonia prevention (Titaley et al., 2014). Caregivers who are more informed are more likely to engage in PHBS and seek appropriate care.

The majority of respondents were housewives, which may positively influence preventive behaviors due to their availability for child care. Research shows that housewives often exhibit stronger adherence to hygiene practices, as they manage household health directly (BMC Public Health, 2021).

In terms of income, 51.8% of respondents earned below the regional minimum wage. Low-income families often prioritize immediate needs over preventive health measures, which may explain limited adoption of proper pneumonia prevention behavior (Fink et al., 2014).

Regarding the gender of children, the study found 57.9% were girls and 42.1% boys. Previous research has shown that boys are biologically more vulnerable to pneumonia due to narrower airways and underdeveloped immune responses (Rudan et al., 2008). Boys are also typically more active outdoors, increasing their exposure to airborne pathogens.

5. Conclusions

This study found that pneumonia prevention practices among parents of children aged 2–59 months at Tawiri Public Health Center are still suboptimal. The majority of respondents demonstrated inadequate behaviors in key preventive areas: only 33.3% practiced proper handwashing (CTPS), 98.2% were exposed to indoor air pollution, and 93.9% applied incorrect cough etiquette. Furthermore, more than half (52.6%) of respondents performed pneumonia prevention inaccurately and ineffectively overall.

Parental characteristics, such as education level, income, and knowledge, were shown to influence pneumonia prevention behaviors. Most respondents were mothers with a senior high school education and low-to-middle income, which

may contribute to limited access to health information and resources. Environmental risk factors—including cigarette smoke, mosquito coil use, and household air pollution—were prevalent and significantly associated with increased pneumonia risk among children.

These findings highlight the urgent need for targeted health education, behavior change communication, and environmental health interventions to improve pneumonia prevention efforts at the household level. Empowering parents—especially mothers—with proper knowledge and practices is essential in reducing pneumonia incidence and improving child health outcomes.

Conflict of Interest

There is no conflict of interest

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