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# Academia Open



*By Universitas Muhammadiyah Sidoarjo*

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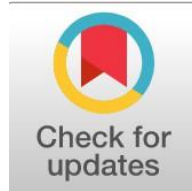
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# Profile and Appropriateness of Antibiotic Use Among Outpatients with Respiratory Tract Infections at the Pagantenan Subdistrict Community Health Center

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## Abstract

**General Background:** Acute respiratory tract infections are common health conditions requiring appropriate antibiotic selection and supportive treatment according to patient symptoms and clinical diagnosis. **Specific Background:** Outpatient treatment involves different antibacterial agents, formulations, doses, and adjunctive therapies, particularly among patients diagnosed with pharyngitis and tonsillitis. **Knowledge Gap:** Local descriptive evidence integrating patient characteristics, diagnostic patterns, antibiotic distribution, and supportive medication use remains limited within community health center settings. **Aims:** This study aimed to identify patient characteristics and describe antibiotic and supportive treatment profiles among patients with respiratory tract infections. **Results:** A retrospective descriptive analysis of 58 medical records showed that female patients represented 53% of cases, while tonsillitis was the most frequent diagnosis at 66%, compared with pharyngitis at 34%. Amoxicillin was the most frequently recorded antibiotic, accounting for 77.58% of antibacterial therapy, followed by cefadroxil, co-trimoxazole, and erythromycin. Supportive treatment included analgesic-antipyretics, antihistamines, cough medicines, corticosteroids, and vitamins, with paracetamol 500 mg recorded most frequently among adjunctive medications. **Novelty:** The study presents an integrated outpatient profile combining demographic characteristics, diagnoses, antibiotic selection, dosage forms, and supportive therapies within one retrospective dataset. **Implications:** The findings provide baseline information for reviewing medication selection, strengthening antibiotic monitoring, and planning symptom-based pharmaceutical services in primary healthcare.

### Highlights:

- Female patients represented 53% of the 58-record sample.
- Tonsillitis accounted for 66%, compared with 34% for pharyngitis.
- Paracetamol 500 mg was the most frequently documented adjunctive therapy.

**Keywords:** ISPA, Treatment Profile, Community Health Center, Antibiotics, Drugs

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## I. Introduction

Acute Respiratory Infections (ARIs) are common illnesses in the general population, particularly affecting the respiratory tract. ARIs are particularly prevalent among young children (toddlers and school-age children) because their immune systems are still developing and they may suffer from malnutrition. Common symptoms of ARI include cough, runny nose, and fever. Acute Respiratory Infections (ARI) can be dangerous if not treated promptly, as the infection may spread throughout the respiratory tract.

Indonesia is a country with a tropical climate. Indonesia has a high mortality rate, particularly from acute respiratory infections (ARI). According to 2018 Riskesdas data, there were 1,017,290 cases of ARI, with children aged 13 and under accounting for the highest number of cases at 182,338 [1]. Based on 2018 Riskesdas data, the prevalence of Acute Respiratory Infections (ARI) in the city of Jakarta reached a total of 2.74% across various districts in Jakarta, and the prevalence of ARI specifically in East Java, in the central district of Pamekasan, reached 3.65%, and the prevalence of Acute Respiratory Infections (ARI) affecting children reached a total of 3.29% across various regions of East Java.

The administration of treatment is a process carried out by a doctor for a patient based on the diagnosis and the patient's reported symptoms. Treatment for patients with acute respiratory infections involves antibiotic therapy and supportive therapies such as analgesic-antipyretic agents, antihistamines, cough suppressants, corticosteroids, and vitamins [2]. Medications for patients with acute respiratory infections—particularly pediatric patients—are administered in various formulations and doses.

## II. Research Methodology

This study employed a purposive sampling method involving retrospective data collection. The sample used in this study consisted of medical records of pediatric patients diagnosed with Acute Respiratory Tract Infections (pharyngitis and tonsillitis) at the outpatient clinic of the Menteng Subdistrict Community Health Center in Jakarta during the period of July–December 2025, comprising 140 pediatric and adolescent patients. The inclusion criteria for this study were pediatric patients diagnosed with ARI (pharyngitis and tonsillitis), children aged 13–50 years, complete and legible medical records of the pediatric patients, including patient characteristics (name, age, symptoms, gender, and diagnosis) and data on the use of antibiotic therapy and supportive therapy, and pediatric patients at the outpatient facility of the Menteng Subdistrict Public Health Center in Jakarta. Meanwhile, the exclusion criteria for this study were pediatric ARI patients with complications and those receiving combination antibiotic therapy. There were 58 patients in the study sample who met the inclusion criteria.

In conducting this study, an ethics committee application was submitted, followed by the submission of a permission letter to the Health Office and the Community Health Center. Once permission was granted, data collection and patient data recording could begin by reviewing the medical records of pediatric patients diagnosed with acute respiratory tract infections (ARIs) who met the inclusion criteria. The data obtained were grouped based on patient characteristics and treatment tables. After data collection, an analysis was conducted on the medical records of pediatric ARI patients (pharyngitis and tonsillitis) at the outpatient facility of the Menteng Subdistrict Community Health Center in Jakarta from January to December 2025. A total of 140 children were included in the sample, and the sample size was calculated using the Slovin formula to determine the population size. Slovin's formula:

$$n = \frac{140}{1 + 140 (0,1)^2}$$

$$n = \frac{140}{1 + 1,41}$$

$$n = \frac{140}{2,41} = 58,3$$

Note:

n = Sample size N = Population size e = Error rate

The value of e used in this study is 0.1 (10%) because the population is large.

The data were analyzed descriptively using the obtained percentages to determine the prevalence of certain characteristics and medication use among pediatric patients with acute respiratory infections, based on established guidelines. The data were analyzed using Microsoft Excel and then presented in the form of tables, diagrams, and descriptive descriptions.

## III. Results and Discussion

The data analysis conducted in this study involved collecting data from the medical records of pediatric patients diagnosed with Acute Respiratory Tract Infection (ARTI). The data obtained were then analyzed using Microsoft Excel and presented in the form of diagrams. Subsequently, the data were analyzed descriptively based on predetermined guidelines.

## 1. Patient characteristics by gender

The study, which grouped patients by gender, aimed to determine the ratio of men to women. Data on gender characteristics were collected using data collection forms, then compiled into tables and charts, after which the results were analyzed in accordance with existing guidelines.

**Table 1.** Patient Gender

| Gender | Total | Persentase |
|--------|-------|------------|
| Men    | 140   | 47%        |
| Women  | 35    | 53%        |

Based on the results of a study conducted at the Menteng Subdistrict Community Health Center in Jakarta during the 2025 period, a total of 58 patients were sampled. As shown in Figure 1, a greater number of female patients experienced ARI compared to male patients. Specifically, there were 31 female patients (53%) and 27 male patients (47%). The incidence of ARI based on gender may be due to differences in anatomy, physiology, and the hormonal systems between women and men [3]. Female pediatric patients are more susceptible to ARI due to a social factor, namely exposure to secondhand smoke.

The presence of one or more smokers in a home can increase the likelihood of family members experiencing health problems, such as respiratory disorders, worsening asthma, and aggravating angina pectoris; it can also increase the risk of developing acute respiratory infections [4]. Exposure to secondhand smoke indoors can increase the likelihood of acute respiratory infections in children in various ways. Cigarette smoke contains various harmful chemicals that can irritate the respiratory tract, trigger inflammation, damage tissue, and weaken the immune system. Furthermore, exposure to cigarette smoke can alter a child's immune system, making them more susceptible to infections from viruses and bacteria that cause ARI. Cigarette smoke and its residue lingering around children can also increase the risk of exposure to germs and pathogens [5].

## 2. Patient characteristics by age

The study, which grouped patients by age, aimed to determine the age group most affected by acute respiratory infections. Data on gender were collected using a data collection form, then compiled into tables and charts; the results were subsequently analyzed in accordance with existing guidelines.

**Table 2.** Age

| Usia    | Jumlah | Persentase |
|---------|--------|------------|
| 13 Year | 12     | 20,68%     |
| 32 Year | 13     | 22,41%     |
| 20 Year | 7      | 12,06%     |
| 25 Year | 8      | 13,79%     |
| 28 Year | 12     | 20,68%     |
| 50 Year | 6      | 10,34%     |

Age is a measurable period based on a person's year of birth. According to the results of a study conducted at the Menteng Subdistrict Community Health Center in Jakarta in 2025, a total of 58 patients were sampled. The 13–50 age group represents the pre-school years, during which individuals tend to have less healthy lifestyles. For instance, they often prefer fast food, which can lead to a weakened immune system and increased susceptibility to illnesses, particularly acute respiratory infections (ARIs). Among children, especially those in the 13–19 age group, there is a high risk of transmission from one child to another. Table 2 shows that the age of 13 had the highest percentage at 23.63% (13 cases). The age of 6 is a period of growth and development and a time of high activity in children [6].

## 3. Patient characteristics by diagnosis

The study, which grouped patients by diagnosis, aimed to determine the most common diagnoses among patients with acute respiratory infections. Data on gender were collected using a data collection form, then organized into tables and charts; the results were subsequently analyzed in accordance with existing guidelines.

**Tabel 3.** Diagnosa

| Diagnosa   | Total | Persentase |
|------------|-------|------------|
| Faringitis | 20    | 34%        |
| Tonsilitis | 38    | 66%        |

Table 3 shows the characteristics of patients based on upper respiratory tract infection (URTI) diagnoses among children at the Menteng Subdistrict Community Health Center in Jakarta, specifically 66% with tonsillitis and 34% with pharyngitis. Among the pediatric patients with tonsillitis, there were 23 female patients, and the majority were 9 years old. Tonsillitis is a

condition of inflammation and infection affecting the tonsils. This disease can vary depending on gender, tonsil size, and age. Children aged 6–12 often experience tonsillitis due to enlargement of the palatine tonsils caused by infection in the Waldeyer's ring [7].

Based on research conducted at the Menteng Subdistrict Community Health Center in Jakarta, tonsillitis is divided into two categories based on duration: acute tonsillitis and chronic tonsillitis. Acute tonsillitis is an inflammation of the tonsils caused by a bacterial or viral infection that lasts less than three weeks. Meanwhile, chronic tonsillitis is a condition characterized by enlarged tonsils accompanied by recurrent infections. Adolescents aged 13–50 years frequently experience tonsillitis. This is typically caused by habits involving the consumption of high-risk foods, such as those containing high levels of additives or MSG, foods with excessive oil content, and cold beverages. These habits can lead to tonsillitis symptoms, including sore throat, cough, and fever [8]. d. Administration of Antibiotic Therapy A study grouping patients based on antibiotic treatment aimed to determine the comparison of the highest frequency of antibiotic therapy administration among pediatric patients with acute respiratory infections (ARI). Data on antibiotic therapy were collected using data collection forms, then organized into tables and diagrams, after which the results were analyzed in accordance with existing guidelines.

**Table 4.** Antibiotic Therapy

| Drug Class    | Drug Name               | Directions for Use | Administration Route | Total | Persentase |
|---------------|-------------------------|--------------------|----------------------|-------|------------|
| Makrolida     | Eritromisin 250 mg      | 2x 1               | Kapsul               | 1     | 1,72%      |
| Penicillin    | Amoxicillin 125mg/5ml   | 3x 1- 2 cth        | Sirup Kering         | 20    | 34,48%     |
|               | Amoxicillin 500 mg      | 3x 1/2- 1          | Tablet               | 25    | 43,10%     |
| Sulfonamida   | Kotrimoksazol 240mg/5ml | 2x1                | Suspensi             | 3     | 5,17%      |
|               | Kotrimoksazol 480 mg    | 2x1                | Tablet               | 1     | 1,72%      |
| Sefalosporin. | Sefadroksil 125mg/5 ml  | 2x2 cth            | Sirup                | 6     | 10,34%     |
|               | Sefadroksil 500 mg      | 2x 1               | Kapsul               | 2     | 3,44%      |

Antibiotics are the most common and widely used medications for infectious diseases such as upper respiratory tract infections (URIs). Most signs and symptoms affecting the respiratory system are usually mild, such as a runny nose and cough, which do not require treatment with antibiotics. However, administering antibiotics for these symptoms can speed up the healing process compared to supportive therapy. Furthermore, administering the correct dose of antibiotics can help prevent secondary bacterial infections. Therefore, the selection and administration of antibiotics for a specific condition must be carefully considered to avoid fostering bacterial resistance in the future [9].

Acute Respiratory Tract Infections (ARIs) are diseases caused by bacteria. Therefore, the use of antibiotics is crucial in their treatment because antibiotics can kill bacteria and inhibit their growth. According to the results of a study conducted at the Menteng Subdistrict Community Health Center in Jakarta, there was no use of antibiotic combinations; all cases studied used only a single type of antibiotic. Using a single type of antibiotic offers several benefits, such as avoiding drug interactions, reducing side effects, and lowering costs, making treatment more affordable [10].

Treatment for patients with Acute Respiratory Tract Infections (ARIs) consists of two approaches: supportive care and antibiotic therapy. According to the results of the study, the most commonly used antibiotic for patients with Acute Respiratory Tract Infections (ARTI) is the penicillin class, specifically amoxicillin in syrup and tablet form, accounting for 77.58% (Table 4). The penicillin class works by inhibiting the formation of mucopeptides required for the construction of microbial cell walls [11]. Amoxicillin is selected to treat ARI because its mechanism of action can function as both bacteriostatic and bactericidal under certain conditions. This occurs because amoxicillin can damage the bacterial cell wall, which contains complex mucoproteins essential for the microbe. Amoxicillin is the primary antibiotic of choice for treating ARI because it falls into the category of broad-spectrum antibiotics. This drug is effective in inhibiting the growth of both Gram-positive and Gram-negative bacteria that can cause secondary infections in URTI [12]. Amoxicillin is more commonly used, especially for children, because it is easier to swallow and more effective when administered. Amoxicillin administered 1–2 times a day is just as effective as administering it 2–3 times a day in pediatric patients. Administering amoxicillin 1–2 times a day for 6–10 days is more effective than using penicillin 3 times a day for 10 days [13].

The use of erythromycin from January to December 2022 was 1 tablet, accounting for 1.72%. Based on the study results, one tablet of erythromycin was administered to patients diagnosed with pharyngitis. Generally, pharyngitis caused by bacteria is attributed to Group A Streptococcus (GAS). GAS refers to the bacterial species "Streptococcus pyogenes," a gram-positive bacterium commonly found in the environment that has adapted well to humans. GAS bacteria are associated with various types of infections, such as pharyngitis, scarlet fever, and impetigo [14]. This bacterium accounts for 15–30% of pharyngitis cases in children. Erythromycin is a macrolide-class antibiotic. Macrolide-class antibiotics have a spectrum of activity similar to penicillin, making them an alternative for patients allergic to penicillin. The mechanism of macrolide antibiotics is to inhibit protein synthesis by interfering with the process that occurs within the ribosome with the assistance of mRNA and tRNA. This protein synthesis involves the 30S and 50S subunits. Consequently, disruption of these ribosomal subunits

disrupts the life of the bacterial cell [15].

Cotrimoxazole is a sulfonamide-class antibiotic. Cotrimoxazole is a combination of sulfamethoxazole and trimethoprim. Based on its chemical composition, sulfonamides are active against both Gram-positive and Gram-negative bacteria. Trimethoprim inhibits bacterial folate reductase and is combined with sulfamethoxazole. This combination is typically prescribed to patients diagnosed with urinary tract infections (UTIs). Based on medical records from the outpatient department of the Menteng Subdistrict Public Health Center in Jakarta, patients with respiratory tract infections (RTIs) were administered cotrimoxazole in different formulations and doses: 3 patients received cotrimoxazole suspension at 240 mg/5 mL, and 1 patient received cotrimoxazole tablets at 480 mg. Cefadroxil is an antibiotic belonging to the cephalosporin class that is effective against both Gram-positive and Gram-negative bacteria. Cefadroxil is a second-line alternative for treating certain types of infections. Cefadroxil was selected because this antibiotic has a broad spectrum of activity and belongs to the first-generation cephalosporins, which can inhibit the growth of Gram-positive bacteria such as *Staphylococcus*. These bacteria are commonly associated with upper respiratory tract infections, such as pharyngitis, otitis media, and tonsillitis [16].

## 4. Administration of supportive therapy

The study, which grouped patients based on supportive therapy, aimed to determine the comparison of the highest number of supportive therapy administrations among patients with acute respiratory infections. Data on supportive therapy were collected using data collection forms, then organized into tables and diagrams, after which the results were analyzed in accordance with existing guidelines.

**Table 5:** Adjuvant Therapy

| No | Therapy Class         | Drug Name                      | Total |
|----|-----------------------|--------------------------------|-------|
|    |                       | Ibuprofen 200 mg tab           | 1     |
|    |                       | Ibuprofen 400 mg tab           | 2     |
| 1  | Analgesik-Antipiretik | Parasetamol 500 mg tab         | 26    |
|    |                       | Ibuprofen sirup 100mg/5ml      | 3     |
|    |                       | Parasetamol sirup 120 mg/5ml   | 12    |
|    |                       | CTM 4 mg tab                   | 18    |
| 2  | Antihistamin          | Cetirizine 10 mg tab           | 8     |
|    |                       | Cetirizine 5 mg/5 ml syrup     | 2     |
|    |                       | Molexdryl syrup                | 1     |
|    |                       | Gliseril Guaiakolat 100 mg tab | 5     |
| 3  | Batuk                 | Obat Batuk Berdahak (OBH)      | 1     |
|    |                       | Ambroxol sirup 15mg/5ml        | 6     |
|    |                       | Ambroxol 30 mg tab             | 12    |
|    |                       | Anacetin                       | 9     |
|    |                       | Ambroxol 30mg/5ml              | 1     |
|    |                       | N-Asetil Sistein 200 mg        | 1     |
| 4  | Kortikosteroid        | Deksametason 0,5 mg tab        | 23    |
|    |                       | Metilprednisolon 4 mg tab      | 2     |
|    |                       | Vitamin C 50 mg tab            | 9     |
| 5  | Vitamin               | Vitamin B Kompleks tab         | 8     |
|    |                       | Multivitamin sirup anak        | 7     |

Treatment for patients with upper respiratory tract infections (URTI) involves not only antibiotics but also, in some cases, the use of supportive therapy in addition to antibiotics to alleviate the symptoms experienced by patients. Table 5 shows that at the Menteng Subdistrict Community Health Center in Jakarta, the most common supportive therapy administered was analgesic-antipyretic medication, specifically 500 mg paracetamol tablets, with 26 cases. Paracetamol is the first-line therapy for children diagnosed with ARI (pharyngitis and tonsillitis). Paracetamol can be administered to ARI patients because pain and fever are symptoms present in nearly all cases of ARI (pharyngitis and tonsillitis). Paracetamol can also be administered to adults based on Level II evidence and a Grade B recommendation. In addition to paracetamol, ibuprofen is an alternative medication administered to ARI patients, particularly those with tonsillitis. Furthermore, 18 tablets of CTM 4 mg, an antihistamine, were administered. CTM is a first-generation antihistamine used to alleviate allergy and cold symptoms [17]. To treat cough in patients with acute respiratory infections, Ambroxol 30 mg tablets are prescribed. Ambroxol belongs to the category of medications for productive cough (mucolytics). Ambroxol works to accelerate the expulsion of phlegm by reducing the viscosity of sputum in the lungs [18]. From the corticosteroid class, Dexamethasone 0.5 mg tablets are prescribed. Dexamethasone is a glucocorticoid-class corticosteroid with adequate anti-inflammatory effects.

Corticosteroids are anti-inflammatory agents that work by inhibiting the phospholipase A2 enzyme, thereby preventing the release of arachidonic acid, which produces the cyclooxygenase (COX) enzyme. The COX enzyme is responsible for the formation of prostaglandins, which are inflammatory mediators [19]. Next is the vitamin group, most notably Vitamin C 50 mg tablets. Vitamin supplements are complex compounds that the body requires and serve to facilitate the regulation of bodily processes. The administration of vitamin supplements to patients aims to strengthen the immune system, as patients with acute respiratory infections (ARIs) experience infections that weaken their immune systems. Therefore, the administration of vitamin supplements is essential [20].

## IV. Conclusion

Based on the research conducted, it can be concluded that the treatment profile for ARI patients at the Menteng Subdistrict Community Health Center in Jakarta during the 2022 period shows that female patients accounted for a higher proportion of ARI cases at 53%; the age group most affected by ARI was 6-year-olds at 22.41%; and among pediatric ARI patients, tonsillitis was the most common condition at 66%. Treatment for Acute Respiratory Tract Infection (ARTI) patients is divided into two categories: antibiotic therapy and supportive therapy. Various forms of antibiotics are prescribed to ARTI patients; however, among children diagnosed with ARTI at the Menteng Subdistrict Community Health Center in Jakarta, amoxicillin 500 mg tablets were the most commonly prescribed medication. In addition to antibiotic therapy, ARI patients receive supportive therapy. The supportive therapy provided includes analgesic-antipyretic therapy with 26 patients receiving 500 mg paracetamol tablets, followed by 18 CTM 4 mg tablets in the antihistamine class, 12 Ambroxol 30 mg tablets in the cough medication class, 23 Dexamethasone 0.5 mg tablets in the corticosteroid class, and 9 Vitamin C 50 mg tablets in the vitamin class.

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