

Antibiotic and Symptomatic Drug Use Patterns in URI Patients at Pratama Soedirman Clinic

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Abstract

Background: Upper Respiratory Tract Infections (URTIs) are among the most common diseases encountered in primary healthcare facilities and are a major cause of patient visits. The high incidence of URTIs may increase the use of medications, particularly antibiotics and symptomatic drugs, which can lead to irrational use and antibiotic resistance if not properly managed. **Objectives:** This study aimed to analyze the pattern of antibiotic and symptomatic drug use among URTI patients at Soedirman Primary Clinic from July 2024 to June 2025. **Methods:** This study was a descriptive observational study with a retrospective design. Data were collected from the medical records of URTI patients at Soedirman Primary Clinic. Total sampling was applied based on inclusion and exclusion criteria, yielding 2.863 cases. Data were analyzed descriptively to describe patient characteristics, URTI diagnosis distribution, and patterns of antibiotic and symptomatic drug use. **Key findings:** The results show that most URTI patients are female (65.4%) and aged 12–25 years (85%). The most common diagnosis is unspecified URTI (J06), accounting for 51.8% of cases. Antibiotics are prescribed in 57.5% of cases, with cephalosporins (60%) being the most frequently used antibiotic class. Corticosteroids are the most commonly prescribed symptomatic drugs. However, when active ingredients in combination products are considered, antihistamines are the most frequently used symptomatic drug class. **Conclusions:** This study indicates that antibiotic use among URTI patients at Soedirman Primary Clinic remains relatively high, highlighting the need to strengthen the implementation of rational drug use in accordance with URTI treatment guidelines in primary healthcare settings.

Keywords: Antibiotics, Prescribing patterns, Primary clinic, Symptomatic drug, URTI

Introduction

Upper respiratory tract infection (URTI) is a disease that results in irritation and swelling of the upper respiratory tract, which includes the nose, sinuses, pharynx, and larynx. These infections can be caused by viruses, bacteria, fungi, or parasites. As a region with a tropical climate, Indonesia has the potential to become an endemic area for various infectious diseases that can pose a health threat to the community at any time, such as URTI. URTI is one of the most common diseases and a leading cause of visits to health facilities worldwide, especially in children. Based on the results of the SKI report (2023), Indonesia has a URTI prevalence of 23.5%, with the highest prevalence of 41.7% in Highland Papua, 39.4% in Central Papua, 36.3% in East Nusa Tenggara, 31.5% in DI Yogyakarta, and 31.3% in West Java. Meanwhile, Central Java province has a prevalence of 24.9%, which is higher than the national prevalence rate [1].

The high prevalence of URTI impacts the increase in visits to health facilities. This increase is directly proportional to drug use, characterized by an increase in the use of symptomatic drugs (anti-influenza, cough medicine, multivitamins) and antibiotics. Based on this, the irrational use of medicines, especially antibiotics, still frequently occurs in patients with upper respiratory tract infections, particularly in children and toddlers.

The administration of antibiotics to treat URTI is often done directly without conducting microbiological cultures

and sensitivity tests beforehand. This can result in various negative consequences such as treatment failure, worsening of the infection, high mortality, widespread disease transmission, the emergence of undesired effects, disease complications, antibiotic prescribing that is not appropriately indicated, and inflated treatment costs. From a previous study regarding the analysis of drug prescribing patterns and therapy costs in URTI patients at the Pratama Soedirman Clinic, research results showed the cephalosporin antibiotic group had the highest rate in antibiotic selection at 42.5% (93 samples), followed by the fluoroquinolone group at 28.3% (62 samples), penicillin at 22.8% (50 samples), and other antibiotics at 6.4% (14 samples) [2]. These results are consistent with similar research in Syria, where the cephalosporin group was the top choice, but differ from the results of research in Semarang, as well as in Jambi, where the penicillin group (amoxicillin) was the top choice as an antibiotic in the treatment of URTI [3-5]. This may be caused by various factors, such as drug availability, cost implications, or simply what the doctor believes to be correct.

Based on the discussion above, researchers want to determine the pattern of antibiotic and symptomatic drug use in URTI patients at the Pratama Soedirman Clinic. Although there has been previous research conducted at the same location raising a similar topic regarding antibiotic use in URTI patients, this study has important differences in terms of focus, data range, and analysis objectives.

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Previous research focused more on antibiotic and steroid prescribing patterns regarding the aspect of therapy costs, whereas this study will specifically analyze the pattern of antibiotic and symptomatic drug use in URTI patients based on the latest data from July 2024 to June 2025. Thus, this study still possesses relevant and significant scientific contributions in providing a current and specific overview regarding antibiotic use at the Pratama Soedirman Clinic. It is hoped that this research can serve as scientific material to improve the quality of service in terms of treatment at health facilities.

Materials and Methods

The design of this research uses descriptive and observational research. The research population includes all patients diagnosed with URTI, where sampling was conducted using the total sampling technique. The research location was at the Pratama Soedirman Clinic, using medical record data from the period of July 2024 to June 2025. Based on the inclusion and exclusion criteria, a total sample of 2,863 cases was obtained.

Results and Discussion

The results of the study conducted on 2,863 samples showed that females were the largest contributor to URTI cases with 1,871 cases (65.4%). Meanwhile, the male gender had a significantly different number from females, with 992 cases (34.6%). The high number of female patients is in line with the demographics of students at Jenderal Soedirman University, where the majority of students are female. This result is also consistent with research conducted on 14,913 URTI cases in Syria where females were the largest contributor to cases, namely 6,861 cases compared to 6,521 cases for males [3]. The majority of URTI cases in women are likely influenced by several factors, such as women generally having a higher level of concern and awareness regarding health conditions, thus being more proactive in seeking health services when experiencing health problems [4]. However, in theory, women show a stronger innate immune response compared to men. This is because the X chromosome is larger and more complex than the Y chromosome, containing many genes, many of which are related to immune function. The X chromosome has a higher concentration of microRNA (miRNA) sequences compared to the Y chromosome, giving women a richer repertoire of miRNA-mediated regulatory mechanisms than men [6].

In other characteristic data, the adolescent age (12-25 years) was the largest contributor to URTI cases, with 2,434 cases (85%), while for the adult age (>25 years) there were 429 cases (15%). The difference in proportion indicates the dominance of URTI cases in adolescents compared to adults. This result is in line with research on 277 URTI cases at the same location, namely Pratama Soedirman Clinic from March to August 2024, which showed that the adolescent age (12-25) was the most common age characteristic in URTI cases with 225 cases, while adults and the elderly (>25 years) numbered 52 cases [2]. The high number of cases in the adolescent age (12-25 years) is likely closely related to high mobility and social interaction in the productive age group of school and

college. Crowded educational environments and group activities facilitate the transmission of URTI-causing pathogens through droplets compared to adults and the elderly who may have more limited interaction patterns. However, in another study on 3,945 URTI cases at Clinic X in Semarang City from January to June 2023, different results were found, where 615 cases were recorded in the 13-25 year age group, 702 cases in the 26-38 year group, 809 cases in the 39-51 year group, and 453 cases in the 52-60 year age group [4]. The results of that study showed that the number of cases in the adolescent age (12-25 years) was not dominant over adults and the elderly. This difference might be caused by variations in regional demographics and environmental risks where samples were taken; the research population by Sari et al. was likely in an industrial environment area that had a greater impact on adults than adolescents.

Table 1. Sample Characteristics

Characteristics	Number	
	n	%
Gender		
Male	992	34.6
Female	1871	65.4
Age		
12-25 years	2434	85.0
>25 years	429	15.0

The results of the distribution of URTI types found that Nonspecific URTI (J06) was the most common case with 1,482 cases, followed by Nasopharyngitis (J00) numbering 932 cases (32.6%), and Pharyngitis (J02) numbering 353 cases (12.3%). This result is in line with the study by Pietrzykowska et al. (2021) regarding the prevalence and prescription of antibiotics in primary care in northern Poland where Nonspecific URTI (J06) was the most common diagnosis with 1,035 cases (59.7%), followed by Nasopharyngitis (J00) and Pharyngitis (J02) [7]. This diagnosis often appears in primary care due to limited supporting examinations, so doctors use the Nonspecific URTI (J06) diagnosis which, based on symptoms and infection location, covers all types of URTI, or doctors simply choose a diagnosis that does not require thorough examination to narrow down the patient's diagnosis. In the study, no cases of Epiglottitis (J05) were found; this indicates that Haemophilus influenzae type b (Hib) vaccination as a government program is increasingly widely implemented, so the Epiglottitis (J05) diagnosis is rarely encountered.

In the distribution of antibiotic use, it was found that 1,645 cases (57.5%) of URTI at the Pratama Soedirman Clinic used antibiotics as URTI treatment in prescriptions, while 1,218 cases (42.5%) were recorded as not using antibiotics in prescriptions. This result is in line with the study by Sous et al. (2023) regarding antibiotic patterns in URTI patients in Syria where 13,382 cases (89.7%) used antibiotics in prescriptions for URTI patients, and 1,531 cases (10.3%) did not use antibiotics. This result is likely caused by difficulties faced by health facilities, especially access to screening resources and specific examinations needed to provide an accurate diagnosis, which may not always be available or affordable [3]. Other factors that might influence this include time pressure during examina-

tion, patient requests for antibiotic use, diagnostic uncertainty resulting in doctor's fear that the patient actually needs antibiotics, clinical experience of the doctor themselves, and the use of evidence-based guidelines and diagnostic tests [8]. However, in another study conducted in Indonesia by Sombul et al. (2024) in Kediri and Sihombing et al. (2023) in Toba, antibiotic use was below 30%, which contradicts the results from the study at Pratama Soedirman Clinic [9-10].

The results of antibiotic use distribution based on URTI diagnosis found that cephalosporins (Cefadroxil & Cefixime) were generally the most selected antibiotics in prescriptions for URTI treatment, totalling 987 samples (60%), followed by fluoroquinolones (Ciprofloxacin & Floxifar) with 539 samples (36.2%). This result is in line with research in Syria and China where cephalosporin antibiotics were the most common choice in URTI prescriptions [3,11]. The high use of cephalosporins might be caused by high resistance to penicillin, which is the recommendation for URTI management, so doctors use cephalosporins, which are other antibiotics recommended in URTI management. Fluoroquinolones have a broad spectrum, but have side effects of damaging the epiphyseal plate which need to be noted especially in patients in the growth age, so their use is not as much as cephalosporins. However, this contradicts the research results in Pakistan and Poland where penicillin antibiotics were most widely

used in prescriptions [7,12]. Other studies in in Semarang and Sorong also obtained contradictory results where the penicillin group was the dominant antibiotic used [4,13]. These differences might be caused by various issues, such as drug availability, cost implications of the drug, or simply based on what the doctor believes to be correct.

In the data on the distribution of symptomatic drug use based on URTI diagnosis, it was found that corticosteroid drugs were the most widely used in prescriptions, namely 2,266 samples, followed by composite 7 with 1,132 samples, and vitamins with 841 samples. However, if the drug content within the composite drug is included in the count, then antihistamines become the most common drug class used in prescriptions, with 2,649 samples, followed by antipyretic-analgesics with 2,604 samples, and corticosteroids with 2,366 samples. This shows that antihistamines and antipyretic-analgesics are the main components in symptomatic URTI therapy. Antihistamines are often used to relieve symptoms of rhinorrhoea, sneezing, and nasal congestion, while antipyretic-analgesics are the first-line therapy to reduce fever and reduce pain that often accompanies URTI, and corticosteroids are used to quickly reduce inflammation often found in URTI. This result is in line with research in India where antihistamines were the most used drug class in URTI treatment, followed by the antipyretic-analgesic (NSAID) class [14].

Table 2. Distribution of URTI Types

Type of URTI	Number	
	n	%
Rhinitis	55	1.9
Nasopharyngitis	932	32.6
Sinusitis	21	0.7
Pharyngitis	353	12.3
Tonsilitis	18	0.6
Laryngitis	2	0.1
Epiglottitis	0	0
ISPA Nonspecific	1482	51.8
Total	2863	100

Table 3. Antibiotic Use

Type of URTI	Therapy with Antibiotics	Therapy without Antibiotics
	n	n
Rhinitis	11	44
Nasopharyngitis	411	521
Sinusitis	15	6
Pharyngitis	132	221
Tonsilitis	13	5
Laryngitis	2	0
Epiglottitis	0	0
ISPA Nonspecific	1061	421
Total	1645	1218

Table 4. Antibiotic Distribution

Type of URTI	Cephalosporin	Sulfonamide	Macrolide	Fluoroquinolone	Penicillin	Lacosamide
	n	n	n	n	n	n
Rhinitis	9	0	0	2	0	0
Nasopharyngitis	145	2	1	247	16	0
Sinusitis	7	0	0	7	0	1
Pharyngitis	78	13	0	33	8	0
Tonsillitis	9	0	0	4	0	0
Laryngitis	2	0	0	0	0	0
Epiglottitis	0	0	0	0	0	0
ISPA Nonspecific	787	11	6	302	5	0
Total	987	26	7	595	29	1

Table 5. Distribution of Symptomatic Drugs

Type of URTI	Mucolytic	Antihistamine	Antipyretic- Analgesic	Bronchodilator	Decongestant	Corticosteroid	Vitamin	Compositum 1	Compositum 2	Compositum 3	Compositum 4	Compositum 5	Compositum 6	Compositum 7	Compositum 8
	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Rhinitis	0	27	9	0	0	31	17	5	30	0	0	13	1	0	0
Nasopharyngitis	71	65	141	10	0	672	314	26	71	13	0	211	134	341	7
Sinusitis	0	8	5	1	0	20	3	0	6	0	0	8	0	0	0
Pharyngitis	13	14	189	5	0	293	126	19	2	2	0	37	63	47	3
Tonsillitis	0	0	10	0	0	15	1	1	2	0	0	2	1	2	0
Laryngitis	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Epiglottitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ISPA Nonspecific	140	85	80	43	2	1233	380	49	24	29	1	75	438	742	45
Total	225	199	434	59	2	2266	841	100	135	44	1	346	637	1132	55

Description:

Compositum 1: Corticosteroid + Antihistamine

Compositum 2: Antihistamine + Decongestant

Compositum 3: Antitussive + Expectorant + Antihistamine

Compositum 4: Antitussive + Expectorant + Antihistamine + Decongestant

Compositum 5: Antipyretic- Analgesic + Antihistamine + Decongestant

Compositum 6: Antipyretic- Analgesic + Antitussive + Antihistamine + Decongestant

Compositum 7: Antipyretic- Analgesic + Expectorant + Antihistamine + Decongestant

Compositum 8: Antipyretic- Analgesic + Antitussive + Expectorant + Antihistamine + Decongestant

Conclusion

Based on the research results, it can be concluded that the characteristics of URTI patients at the Pratama Soedirman Clinic are dominated by females and the adolescent age group. The most frequently established diagnosis is Nonspecific URTI. In treatment patterns, antibiotic use

was recorded as quite high at 57.5%, with the cephalosporin group being the primary choice most widely prescribed. Meanwhile, symptomatic drugs most widely used for patient treatment were corticosteroids. However, when viewed through the content in the medication, the antihistamine class became the most widely used.

Supplementary Material

None

Author Contributions

MH : Conceptualization, Methodology, Writing-Original Draft. **MAW** : Data Curation, Formal Analysis, Visualization. **SC** : Supervision, Funding Acquisition, Writing- Review & Editing. **VRB** : Supervision, Funding Acquisition, Writing- Review & Editing.

Conflict of Interest

The authors have no financial conflicts of interest to declare.

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References

- [1] BKPK, 2023. Survei Kesehatan Indonesia (SKI) Tahun 2023 Dalam Angka. *Kemendes BKPK*.
- [2] Muthmainnah, 2024. Analisis Pola Peresepan Obat dan Biaya Terapi pada Pasien ISPA di Klinik Pratama Soedirman. Universitas Jenderal Soedirman.
- [3] Sous, M.M.J. Al, Houry, H.N. Al, Safiah, M.H., Alazrak, S.O., Akwan, R.R. 2023b. Antibiotic prescription patterns for acute upper respiratory tract infections in an outpatient population with health insurance in Syria — a retrospective cross-sectional study. *IJID Reg*. Vol. 7: 66–71.
- [4] Sari, W.K., Advitasari, Y.D., Elisa, N. 2024. Pola Peresepan Antibiotic Untuk Pengobatan Infeksi Saluran Pernafasan Atas (ISPA) di Klinik X Kota Semarang. *Cendekia J. Pharm*. Vol. 8: 17–27.
- [5] Dewi, R., Adliana, Soyata, A. 2022. Evaluasi Penggunaan Antibiotik Pada Pasien Infeksi Saluran Pernafasan Atas (ISPA) Rawat Jalan Di Puskesmas Tanjung Pinang Kota Jambi 2019. *J. Farm. Etam*. Vol. 2: 117–123.
- [6] Feng, Z., Liao, M., Zhang, L. 2024. Sex Differences in Disease: Sex Chromosome and Immunity. *J. Transl. Med*. Vol. 22.
- [7] Pietrzykowska, M., Nowicka-Sauer, K., Siebert, J. 2021. Respiratory Tract Infections in Primary Health Care: Prevalence and Antibiotic Prescribing in a Primary Care Practice During One Year. *Fam. Med. Prim. Care Rev*. Vol. 23: 203–208.
- [8] Reali, S., Kwang, Y.C., Cho, J.-G., Alffenaar, J., Aslani, P. 2025. Factors Influencing Physicians' Antimicrobial Prescribing Decisions: A Systematic Review of Qualitative Studies. *Br. J. Clin. Pharmacol*. Vol. 91: 1330–1351.
- [9] Sombuk, C.R.K., Astiarani, Y., Kristian, K. 2024. Profil Pengobatan Infeksi Saluran Napas Atas Akut (ISPA) dan Hubungannya dengan Kunjungan Ulang Pasien. *J. Ilmu Kesehat. Masy*. Vol. 13: 335–342.
- [10] Sihombing, Y.R., Marbun, R.A. teresia, Pasaribu, F.N., Situmorang, N.B. 2023. Evaluasi Penggunaan Obat pada Pasien Infeksi Saluran Pernapasan Akut (ISPA) Non Pneumonia di PUSKESMAS Sigumpar Tahun 2022. *J. Farm*. Vol. 6.
- [11] Zhao, H., Wei, L., Li, H., Zhang, M., Cao, B., Bian, J., Zhan, S. 2021. Appropriateness of Antibiotic Prescriptions in Ambulatory Care in China: a Nationwide Descriptive Database Study. *Lancet Infect. Dis*. Vol. 21: 847–857.
- [12] Hashmi, H., Sasoli, N.A., Sadiq, A., Raziq, A., Batool, F., Raza, S., Iqbal, Q., Haider, S., Jan, S.U., Mengal, M.A. 2021. Prescribing Patterns for Upper Respiratory Tract Infections: A Prescription-Review of Primary Care Practice in Quetta, Pakistan and the Implications. *Front. Public Heal*. Vol. 9: 1–7.
- [13] Pasaribu, E., Sanggel, M.J. 2024. Gambaran peresepan obat antibiotik dan obat suportif pada pasien rawat jalan infeksi saluran pernapasan akut di Puskesmas Klasaman, Kota Sorong, Tahun 2023. *Kisi Berkelanjutan Sains Medis dan Kesehat*. Vol. 1.
- [14] Shah, M., Trivedi, N.A., Chauhan, J. 2023. Appropriateness of Antibiotic Prescribing for Upper Respiratory Tract Infection in a Tertiary Care Teaching Hospital: a Cross Sectional Study. Vol. 12: 259–263.