CHAPTER I
INTRODUCTION

1.1 Research Background

Acute respiratory infections (ARI), such as bronchopneumonia, are one of the most common diseases in the community. WHO in 2020 reported that the highest disease in developing countries is bronchopneumonia, which causes death in children. Based on WHO data, the incidence of pneumonia infection in Indonesia among under-fives is estimated to be between 10 and 20% per year. Data from the Ministry of Health of the Republic of Indonesia 2021 in 2020 show that bronchopneumonia respiratory infections in children that occurred in East Java had the 5th largest position in Indonesia at 42.9%.[1] According to the respondent's data report, the second largest disease that occurred in Tidar Magelang Hospital in 2023 was ARI bronchopneumonia, with a total of 2,493 patients. In cases that occurred in Magelang City Hospital, bronchopneumonia has not decreased until now. Based on the Magelang city government profile, Magelang is categorized as a wet climate area with high rainfall. This leads to high humidity, causing bacteria, viruses, and fungi to proliferate [2].

Bronchopneumonia is an ARI disease caused by microorganisms such as viruses, fungi, and bacteria. ARI bronchopneumonia is an acute respiratory infection that affects the lungs. Inflammation of the lung parenchyma occurs from the bronchi to the alveoli. [3] The lungs are made up of tiny sacs called alveoli that are filled with air. A person suffering from bronchopneumonia has the bronchi and alveoli filled with pus and fluid, making breathing painful and limiting oxygen intake [4].

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[1] RI Kemenkes, "Profil Kesehatan Indonesia 2020," *Kementrian Kesehatan Republik Indonesia* 139 (2021).

[2] Ludfi Yusela, Muhammad Ali Sodik, and STIKes Surya Mitra Husada, "Kondisi Faktor-Faktor Lingkungan Fisik Rumah Dengan Kejadian Pneumonia Pada Anak Balita," *Jurnal STIKes Surya Mitra Husada* (2018): 1–7.

[3] Andy Samuel, "Bronkopneumonia on Pediatric Patient," *Journal Agromed Unila* 1, no. 2 (2014): 185–189.

[4] Sakila Ersa Putri Hts and Dika Amalia, "Bronkopenmonia," *Jurnal Medika Nusantara* 1, no. 3 (2023): 134–145.

ARI bronchopneumonia is common in pediatrics and is one of the leading causes of death in children under five. WHO data states that ARI bronchopneumonia accounts for 14% of all deaths in children under 5 years old[5]. According to the WHO, bronchopneumonia contributed to 5.50% of under-five deaths worldwide in 2019[6]. The disease is more common in children under 5 years of age, as the immune system of paediatrics is still developing. Therefore, pediatricians are more likely to experience bronchopneumonia[7].

In hospitalized paediatric bronchopneumonia ARI patients, there is a potential risk of drug toxicity that is of particular concern to medical personnel so that it can harm patients[8]. Unintended drug-related problems (DRPs) in treatment can result in dangerous clinical outcomes. The factors that cause DRPs are polypharmacy, comorbidities, and length of hospital stay[9]. The higher prevalence of bronchopneumonia ARI will contribute to the high incidence of DRPs. The classification of DRP, according to Cipolle includes indication without drug, drug without indication, inappropriate drug selection, dose too high, dose too low, adverse drug reactions, and patient non-compliance[10]. DRP, according to Cipolle, is more commonly used in Indonesia[11], while DRP, according to PCNE, is more complicated and takes a long time[12].

In treating the disease, there needs to be an effort to be healthy for the patient. In the hadith, it is explained that Allah commands humans to seek treatment because

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[5] World Health Organization, *The WHO STEPwise Approach to Surveillance* (World Health Organization. Regional Office for Europe, 2021).

[6] Nader A. Fawzy et al., "A Systematic Review of Trials Currently Investigating Therapeutic Modalities for Post-Acute COVID-19 Syndrome and Registered on WHO International Clinical Trials Platform," *Clinical Microbiology and Infection: The Official Publication of the European Society of Clinical Microbiology and Infectious Diseases* 29, no. 5 (May 2023): 570–77,

[7] Sriwati Palaguna, "Bronkopneumonia Pada Anak Umur Nol Sampai Satu Tahun Dan Asap Rokok," *Jurnal Ilmiah Ecosystem* 23, no. 2 (2023): 501–509.

[8] Yohanes Ayele and Zelalem Tilahun Tesfaye, "Drug-Related Problems in Ethiopian Public Healthcare Settings: Systematic Review and Meta-Analysis," *SAGE Open Medicine* 9 (2021): 205031212110097.

[9] Yohanes Ayele and Zelalem Tilahun Tesfaye, "Drug-Related Problems in Ethiopian Public Healthcare Settings: Systematic Review and Meta-Analysis," *SAGE Open Medicine* 9 (January 2021)

[10] Sylvi Adiana, "Klasifikasi Permasalahan Terkait Obat (Drug Related Problem/DRPs)," *Indonesian Journal of Health Science* 2, no. 2 (2022): 54–58.

[11] Benjamin J Basger, Rebekah J Moles, and Timothy F Chen, "Development of an Aggregated System for Classifying Causes of Drug-Related Problems," *Annals of Pharmacotherapy* 49, no. 4 (2015): 405–418.

[12] Carita Linden-Lahti1, 2*, Anna Takala1, Anna-Riia Holmström1 and Marja Airaksinen1, *Applicability of Drug-related Problem (DRP) Classification System for Classifying Severe Medication Errors*, 743rd ed., vol. 23 (BMC Health Services Research, 2023).

all diseases have a cure except old age and death. This is the same as human action to eliminate hunger, cover himself with a cause of the cold, etc. Allah reminds us in the Qur'an about effort and not despair in treatment in order to achieve the goal of treatment therapy[13]. As described in the Muslim hadith, namely

لِكُلّ دَاءٍ دَوَاءٌ فَإِذَا أُصِيبَ دَوَاءُ الدَّاءِ بَرَأَ بِإِذْنِ اللَّهِ عَزَّ وَجَلَّ

"*Every disease has a cure. If the cure of a disease is right, it will heal with the permission of Allah SWT*" *(HR. Muslim)*.

When we get the gift of sickness, we should not stay silent without trying to recover, but we are guided to try as much as possible to recover from the disease. When the disease is treated with the proper treatment, it will be able to maximize the treatment[14]. The high incidence of bronchopneumonia ARI disease means that researchers want to evaluate a treatment by optimizing treatment that can reduce the incidence of DRPs, which has a harmful and detrimental impact on patients.

1.2 Research Problems
The problem formulations in this research are

1. What is the treatment description of pediatric bronchopneumonia ARI patients hospitalized at Tidar Hospital?

2. What is the potential incidence of DRP in the treatment of inpatient pediatric bronchopneumonia ARI patients at Tidar Hospital?

1.3 Research Objectives
The objectives of this research are

1. To describe the treatment of pediatric bronchopneumonia ARI inpatients at Tidar Hospital.

2. To determine the potential incidence of DRP in the treatment of inpatient pediatric bronchopneumonia at Tidar hospital.

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[13] Elin Yulinah Sukandar, "Tren Dan Paradigma Dunia Farmasi," *Bandung: Departemen Farmasi FMIPA ITB* (2006).

[14] Abu Al-Husain Muslim An-Nisabury, "Bin Al-Hajjaj Bin Muslim al-Qusyairi," *Shahih Muslim. Beirut: Daar al-Kutub al-Ilmiyah* (1992).

1.4 Research Benefits

1.4.1 Theorical Benefits

        The benefits of this study can be used to assist in improving patient treatment patterns and achieving the desired therapeutic effect.

1.4.2 Practical Benefits

        The results of this study are expected to add insight and knowledge ~~so as~~ to improve treatment guidelines related to bronchopneumonia, ARI disease, and the role of clinical pharmacy in Tidar Hospital.

1.5 Authenticity Research

        Research on DRPs has been conducted by several researchers, as shown in Table 1 below.

Table 1 Authenticity Research

Research title	Type of Research	Variable	Result	Differences in research	
				Another study	Real Study
Analysis of DRPs (Drug Related Problems) in Geriatric Pneumonia Patients in the Inpatient Installation of RSUP dr. M. Djamil Padang[15]	Observation	Dependent variable: Pneumonia therapy and geriatrics Independent variable: DRPs Research method: Retrospective Data collection technique: Purposive sampling	Medication-related problems in geriatric pneumonia patients include inappropriate medications in 3 cases (1.82%), inappropriate duplication of active substances in 8 cases (4.87%), medications without clear indications in 3 cases (1.82%), clear indications but not treated in 14 cases (8.53%), dosage issues including too high doses and/or frequencies in 1 case (0.60%), too low doses and/or frequencies in 2 cases (1.21%), and interaction issues, specifically potential drug interactions in 133 cases (81.09%).	Variable: Geriatric Pneumonia, DRPs Method: Cross-Sectional DRP, according to PCNE V5.1 Indicators Dipro 2015, PDPI 2003, ISO, and drug.com website	Variables: Bronchopneumonia ISPA, Pediatrics, DRPs Method: Descriptive observational DRP according to Cipolle Indicators: Bronchopneumonia treatment therapy guidelines according to WHO and Tidar Hospital Medscape, ISO.
Drug Related Problem in patients with pneumonia at Jasa Kartini	Observation	Dependent variable: pneumonia patient	Drug Related Problems (DRPs) amounted to 50 cases with the category of indication without medication 11 cases (22.0%) including indications for pulmo-	Variable: Pneumonia, DRP All ages Sampling method: consecutive	Variables: Bronchopneumonia ISPA, DRP, pediatrics

[15] Endang Agustina et al., "Analisis DRPS (Drug Related Problems) Pada Pasien Geriatri Pneumonia Di Instalasi Rawat Inap RSUP Dr. M. Djamil Padang," *Jurnal Farmasi Higea* 15, no. 1 (2023): 84–92.

Research title	Type of Research	Variable	Result	Differences in research	
Tasikmalaya city hospital[16]		therapy Independent variable: DRPs Research method: retrospective Sampling technique: consecutive sampling	nary tuberculosis, diarrhea, and hypertension; medication without indication 0 cases; underdose in eight cases (16.0%) including Analsik, Largactil, Alganax, Sanmol, Ketorolac, Risperidon, ranitidine; overdose in 12 cases (24.0%) including Tracetat, Sanmol Syrup, Codipront, Citicolin, Lansoprazole, Lancid, Furosemide; wrong medication 0 cases; drug interaction 19 cases (38.0%) with major category (10.5%), moderate (68.4%), and minor (21.1%); and harmful medication 0 cases.	Another study sampling. DRP according to PCNE V9.1	Real Study Sampling method: purposive sampling DRP according to Cipolle
Identification of Drug Related Problems (DRPs) in Pediatric Patients with Community-Acquired Pneumonia in the Inpatient Installation of RSD Madani, Central Sulawesi Province[17]	Observation	Dependent variables: CAP, pediatrics, inpatient Independent variables: DRPs Research method: prospective Data collection technique: random sampling	The research results obtained from 28 patients showed the number of DRP incidents in the inappropriate medication category was 1 case (1.7%), drug interactions were 35 cases (58.3%), underdose of medication was 18 cases (30%), overdose of medication was 6 cases (10%), and medication without indication was 0 cases (0%).	*Variables: CAP, DRP Method: Prospective DRP according to Cipolle/helper/strand 1990 Indicators: British National Formulary for Children Drug Interaction Checker (Medscape) and Drug Interaction Facts.*	Variables: Acute Respiratory Infection (ARI) bronchopneumonia, DRP Retrospective Method DRP according to Cipolle 2004 Bronchopneumonia treatment guidelines according to WHO and Tidar Hospital, Medscape, and ISO.

[16] Nur Rahayuningsih, Amalia Rahayu, and Muharam Priatna, "Drug Related Problems in Patients with Pneumonia at Jasa Kartini Tasikmalaya City Hospital," *Pharmacy Education* 23, no. 2 (2023)

[17] Putu Maharani Ajeng Astiti, Alwiyah Mukaddas, and Safarudin Atho Illah, "Identifikasi Drug Related Problems (DRPs) Pada Pasien Pediatri Pneumonia Komunitas Di Instalasi Rawat Inap RSD Madani Provinsi Sulawesi Tengah," *Jurnal Farmasi Galenika (Galenika Journal of Pharmacy) (e-Journal)* 3, no. 1 (2017): 57–63.