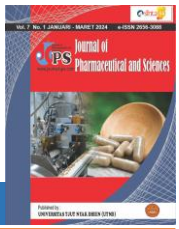
Journal of Pharmaceutical and Sciences
Electronic ISSN: 2656-3088 DOI: https://doi.org/10.36490/journal-jps.com
Homepage: https://journal-jps.com
ORIGINAL ARTICLE JPS. 2026, 9(2), 2017-2023



Cost Analysis of Asthma Treatment in Child Outpatient Patients at a Public Hospital in Yogyakarta Based on INA-CBG's Rates in 2023

Analisis Biaya Pengobatan Asma Anak Pada Pasien Rawat Jalan di Rumah Sakit Pemerintah di Yogyakarta Berdasarkan Tarif INA-CBG's Tahun 2023

Ingenida Hadning [a]*, Muhammad Aqil Faiq Akbar [a], and Aris Widayati [a]

[a] *Department of Pharmacy, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia.*

*Corresponding Authors: ingenida.hadning@umy.ac.id

Abstract

Introduction: Asthma is one of the most common chronic respiratory diseases in children, affecting daily activities, growth, and quality of life. Recurrent treatment imposes a considerable economic burden on families and healthcare providers. The Indonesian government implements the *Indonesian Case-Based Groups* (INA-CBG) payment system within the National Health Insurance (JKN) program to control healthcare costs. **Objective:** This study aimed to analyse direct medical costs and evaluate the conformity between actual treatment costs and INA-CBG tariffs in 2023 for pediatric outpatient asthma patients at a public hospital in Yogyakarta. **Methods:** An observational retrospective study was conducted using medical records and cost data of pediatric asthma outpatients at RS Paru Respira Yogyakarta from January 2024 to September 2025. Samples were selected through total sampling based on inclusion and exclusion criteria. Descriptive analysis was used to calculate direct medical costs, while conformity with INA-CBG tariffs was analysed using a one-sample t-test and a Wilcoxon test. **Results:** A total of 79 patients with 290 outpatient visits were analysed. The average actual costs were Rp248,953 for Q-5-44-0 (n=243), Rp383,490 for J-3-13-0 (n=28), and Rp406,506 for J-3-16-0 (n=19). Medication costs accounted for the largest component (42-52%). Significant differences were found between actual costs and INA-CBG tariffs for all codes ($p<0.05$). Actual costs exceeded tariffs for codes Q-5-44-0 and J-3-13-0 but were lower for code J-3-16-0. The total negative difference reached Rp14,282,904. **Conclusion:** There is a significant discrepancy between actual treatment costs and INA-CBG tariffs for pediatric outpatient asthma care in 2023. Medication costs represent the largest component of treatment expenditures. These findings indicate the need for continuous evaluation of the INA-CBG payment system and healthcare cost management strategies to improve efficiency while maintaining service quality.

***Keywords*: Asthma; Children; Outpatient; INA-CBG Rates.**

Abstrak

Pendahuluan: Asma merupakan salah satu penyakit pernapasan kronis paling umum pada anak yang dapat mengganggu aktivitas sehari-hari, pertumbuhan, dan kualitas hidup. Pengobatan berulang menimbulkan beban ekonomi yang signifikan bagi keluarga dan penyedia layanan kesehatan. Pemerintah Indonesia menerapkan sistem pembayaran *Indonesian Case-Based Groups* (INA-CBG) dalam program Jaminan Kesehatan Nasional (JKN) untuk mengendalikan biaya kesehatan. **Tujuan:** Penelitian ini bertujuan untuk menganalisis biaya medis langsung dan mengevaluasi kesesuaian antara biaya aktual dan tarif INA-CBG tahun 2023 pada pasien asma anak rawat jalan di rumah sakit pemerintah di Yogyakarta. **Metode:** Penelitian observasional retrospektif dilakukan dengan menggunakan rekam medis dan data biaya pasien asma anak yang dirawat jalan di RS Paru Respira Yogyakarta pada periode Januari 2024–September 2025. Sampel dipilih menggunakan metode *total sampling* berdasarkan kriteria inklusi dan eksklusi. Analisis deskriptif digunakan untuk menghitung biaya medis langsung, sedangkan kesesuaian dengan tarif INA-CBG dianalisis menggunakan *uji t sampel tunggal* dan uji Wilcoxon. **Hasil:** Sebanyak 79 pasien dengan 290 kunjungan rawat jalan dianalisis. Rata-rata biaya aktual sebesar Rp248.953 untuk kode Q-5-44-0 (n=243), Rp383.490 untuk kode J-3-13-0 (n=28), dan Rp406.506 untuk kode J-3-16-0 (n=19). Komponen biaya terbesar berasal dari biaya obat (42-52%). Terdapat perbedaan signifikan antara biaya aktual dan tarif INA-CBG untuk semua kode ($p<0,05$). Biaya aktual lebih tinggi daripada tarif pada kode Q-5-44-0 dan J-3-13-0, namun lebih rendah pada kode J-3-16-0. Total selisih negatif mencapai Rp14.282.904. **Kesimpulan:** Terdapat ketidaksesuaian yang signifikan antara biaya aktual pengobatan asma anak rawat jalan dan tarif INA-CBG tahun 2023. Biaya obat merupakan komponen terbesar dalam pengobatan. Temuan ini mengindikasikan perlunya evaluasi berkelanjutan terhadap sistem pembayaran INA-CBG dan manajemen biaya layanan kesehatan untuk meningkatkan efisiensi tanpa mengorbankan kualitas pelayanan.

Kata Kunci: Asma; Anak-anak; Rawat Jalan; Tarif INA-CBG's

Article History:
Received: 20/04/2026,
Revised: 14/06/2026,
Accepted: 14/06/2026
Available Online: 30/06/2026.

QR access this Article

https://doi.org/10.36490/journal-jps.com.v9i2.1630

Introduction

Asthma is a chronic inflammatory disease of the respiratory tract that commonly occurs in children and is characterised by symptoms such as wheezing, shortness of breath, chest tightness, and recurrent coughing. This disease can impact a child's quality of life because persistent asthma attacks can disrupt daily activities and their growth and development. [1]. In addition to its clinical impact, asthma also causes a significant economic burden due to the need for long-term treatment and repeated healthcare visits. According to 2018 data from the World Health Organisation (WHO), asthma is one of the most prevalent non-communicable diseases worldwide. In Indonesia, the prevalence of asthma reaches 2.5% of the total population, with the Special Region of Yogyakarta being one of the regions with the highest prevalence at 4.5% [2]. High prevalence is an important reason to study the costs of asthma treatment, particularly among pediatric outpatients. The Indonesian government, through the National Health Insurance (JKN) program, uses the Indonesian Case-Based Groups (INA-CBGs) payment system to pay BPJS Kesehatan claims and help control healthcare costs. [3].

Research on the suitability of real costs relative to INA-CBG's rates has previously been conducted for several diseases and inpatient asthma cases. Previous research by Lorensia et al [4] showed that the average real cost of hospitalisation for asthma patients was higher than the INA-CBG's rates, resulting in a negative difference in hospital costs. Another previous study on ischemic stroke patients also found a difference between real hospital costs and INA-CBG's rates. [5]. However, most previous studies focused on inpatients and had not examined outpatient pediatric asthma patients. Furthermore, research on direct medical costs among outpatient pediatric asthma patients remains limited, thus not providing a comprehensive picture of the alignment of actual costs with INA-CBG's rates in outpatient services. This condition indicates a research gap that warrants further study, as the discrepancy between actual costs and INA-CBG's rates can affect the efficiency of hospital financial management and the quality of health services. Unlike the study conducted by Lorensia et al. [4], which focused on inpatient pediatric asthma patients, the present study specifically evaluates outpatient pediatric asthma services. Furthermore, while previous studies [6] were conducted in different healthcare settings and regions; this study applies the 2023 INA-CBG tariff regulation in a public hospital in Yogyakarta. Therefore, this study provides up-to-date, region-specific evidence on the alignment between actual treatment costs and INA-CBG reimbursement rates in pediatric outpatient asthma care.

Based on the description, this study was conducted to determine the direct medical cost of outpatient treatment for pediatric asthma patients at a public hospital in Yogyakarta during the period January 2024–September 2025 and to analyse the suitability of real costs with INA-CBG's rates based on the Minister of Health Regulation Number 3 of 2023. This study is expected to provide information on the economic burden of pediatric asthma treatment, serve as evaluation material for hospitals in managing health service costs, and assist the government in reviewing the effectiveness of the INA-CBG's financing system for outpatient services for pediatric asthma patients.

Research Methodology

Research Design and Materials

This study employed observational research. Data collection was conducted retrospectively, using patient medical records and outpatient treatment cost data for pediatric asthma patients. Medical record data was obtained at RS Paru Respira Yogyakarta from January 2024 to September 2025. The variables in this study

Electronic ISSN : 2656-3088
Homepage: https://www.journal-jps.com

are the average real cost of childhood asthma treatment and INA-CBG's 2023 rates. The actual costs of asthma treatment are the costs incurred by pediatric asthma patients during outpatient visits at the hospital. These costs include all direct medical expenditures for treatment provided during outpatient services. The actual costs examined in this study were direct medical costs, including administrative, pharmacy, laboratory, and doctor fees, as well as other costs. The real costs were aligned with the INA-CBGs tariffs if they were less than or equal to those tariffs under Regulation Number 3 of 2023.

Population and Sample

The population in this study were pediatric asthma outpatients at RS Paru Respira Yogyakarta from January 2024 to September 2025. The sample was a portion of the population considered representative. The sample for this study comprised pediatric asthma patients undergoing outpatient therapy at RS Paru Respira Yogyakarta who met the study's inclusion and exclusion criteria. The sampling method used was total sampling.

There were 79 pediatric asthma patients included in this study, but the unit of analysis for treatment cost calculations was the outpatient visit (episode of care). A single patient could have more than one outpatient visit during the study period. Therefore, a total of 290 outpatient visits were analysed, comprising 243 visits classified under INA-CBG code Q-5-44-0, 28 under code J-3-13-0, and 19 under code J-3-16-0.

Data Analysis

Data analysis for calculating direct medical costs was carried out using descriptive analysis to determine the average total real cost of outpatient asthma treatment at RS Paru Respira Yogyakarta from January 2024 to September 2025. Analysis of the suitability of the real costs of outpatient pediatric asthma patients at RS Paru Respira Yogyakarta with the INA-CBG's rates was carried out using a one-sample t-test of normally distributed data, with the test value of each code using the INA-CBG's rates, and the one-sample Wilcoxon test obtained data results that were not normally distributed.

Results and Discussion

Characteristics of Asthma Patients

This study was conducted on outpatient pediatric asthma patients at RS Paru Respira Yogyakarta from January 2024 to September 2025. Based on medical record data collection and treatment costs, 79 patients met the study inclusion criteria. Patient characteristics showed that there were more male patients than female patients, namely 47 (59.5%), compared with 32 (40.5%). By age group, patients aged 6–12 years were the largest group, with 37 patients (46.8%), followed by those aged 13–17 years, with 27 patients (34.2%), and those aged 0–5 years, with 15 patients (19%).

Table 1. Characteristics of Asthma Patients

Characteristics	Number of Patients	Percentage (%)
Gender		
Male	47	59,5
Female	32	40,5
Total	79	100
Age		
0-5 years	15	19
6-12 years	37	46,8
13-17 years	27	34,2
Total	79	100

The characteristics presented in Table 1 are based on individual patients (n = 79), whereas the cost analyses in Tables 2, 4, and 5 are based on outpatient visits (n = 290). Therefore, the number of observations used for the cost analysis exceeds the number of individual patients because some patients had repeat visits during the study period.

This result is in line with previous research, which shows that the prevalence of asthma in children is higher in boys than in girls. This condition may be influenced by the relatively smaller size of boys' airways

Electronic ISSN : 2656-3088
Homepage: https://www.journal-jps.com

compared to their body size, making them more susceptible to respiratory problems. [7]. Before puberty, asthma is 1.5-2 times more prevalent in boys than in girls due to differences in lung development. Boys have smaller airways relative to their body size, and testosterone suppresses the immune system. However, post-puberty girls experience an increased risk of asthma [8]. Furthermore, previous research also states that the school-age group has the highest incidence of asthma due to an underdeveloped immune system [9]. At the age of 5 years, as many as 80-90% of children experience their first asthma symptoms due to an imbalance of Th1/Th2 (dominant allergic immune response) and nutritional intake that is divided for organs/bones, so that it can affect the defence of peripheral tissue against allergens/viruses [10].

Analysis of Outpatient Treatment Costs for Asthma Patients

Treatment cost analysis was conducted using INA-CBG codes for outpatients. The results showed that the average real cost of treatment for patients with code Q-5-44-0 was Rp248,953 ± Rp89,093; for code J-3-13-0, Rp383,490 ± Rp122,956; and for code J-3-16-0, Rp406,506 ± Rp111,846. The increase in average real costs indicates that the higher the level of service and supportive measures provided, the higher the treatment costs. These results align with previous research indicating that greater asthma severity increases patient treatment costs. [11].

Table 2. Real Cost Components of Asthma Treatment

Cost Component	Q-5-44-0 (n=243)	Patients Receiving Service	J-3-13-0 (n=28)	Patients Receiving Service	J-3-16-0 (n=19)	Patients Receiving Service
Doctor Services	Rp44.290	243 (100%)	Rp44.178	28 (100%)	Rp47.368	19 (100%)
Medication	Rp119.662	243 (100%)	Rp198.597	28 (100%)	Rp169.927	19 (100%)
Radiology	Rp85.000	4 (1,6%)	Rp85.000	4 (14,3%)	Rp85.000	6 (31,6%)
Rehabilitation	-	0(0%)	Rp55.714	28 (100%)	Rp104.210	19 (100%)

The patient's INA-CBG rate determines the severity level. The higher the severity, the higher the cost for each treatment. Differences in rates are due to the composition, medication type, and physiotherapy procedures. The INA-CBG rate cannot cover certain components, resulting in higher hospital costs.[12].

Table 3. Distribution of Medication Types for Pediatric Asthma Outpatients

Type of Treatment	Total	%
Oral Therapy		
Montelukast Sodium	182	39,3
Procaterol HCl	174	37,6
Triamicinolone	107	23,1
Total Oral Therapy	463	100
Inhalation Therapy		
Salmeterol + Fluticasone Propionate	122	46.9
Budesonide	15	5.8
Ipratropium Bromide + Salbutamol Sulfate	13	5
Salbutamol sulfat	55	21.2
Budesonide + Formoterol fumarate dehydrate	55	21.2
Total Inhalation Therapy	260	100

The largest cost component across all INA-CBG codes is medication, accounting for 48% in code Q-5-44-0, 52% in code J-3-13-0, and 42% in code J-3-16-0. These results align with previous research, which showed that medication costs are the largest component of asthma treatment. The high cost of medication is influenced by the use of inhalation therapy and combination therapy routinely given to pediatric asthma patients to control symptoms and prevent exacerbations. [13]. The patient's symptoms or condition influence treatment costs. Certain medications are required for pediatric patients with asthma.

Inhalation therapy is the primary treatment option for asthma because it delivers medication directly to the respiratory tract at low doses with fewer side effects. [14]. The most commonly used inhalation therapy in this study was the combination of Salmeterol and Fluticasone Propionate, at 46.9%, followed by Salbutamol sulfate and the combination of Budesonide and Formoterol fumarate dehydrate, at 21.2%. Inhalation therapy

Electronic ISSN : 2656-3088
Homepage: https://www.journal-jps.com

is the rapid administration of medication into the respiratory system via a specific device. Inhalation therapy is divided into three types based on how they work: nebulisers, dry powder inhalers (DPIs), and metered dose inhalers (MDIs). For pediatric patients, corticosteroids are recommended for asthma management, either alone or in combination with a long-acting β2 agonist (LABA) [15].

The oral therapies most commonly used in this study were montelukast Sodium (39.3%), Procaterol HCl (37.6%), and Triamicinolone (23.1%). Oral therapy in pediatric asthma patients is used for short-term effectiveness. It must receive control medication containing ICS (Inhaled Corticosteroids) to reduce the side effects of serious exacerbations and control symptoms by recommending use for only 3-5 days with close monitoring to avoid the impact of dependence. [14].

Correspondence of Average Real Costs to INA-CBG's Tariff

This study also analysed the suitability of actual costs relative to INA-CBG's rates in accordance with the Minister of Health Regulation Number 3 of 2023. This research conducted a normality test to assess whether the data were normally distributed. The normality test results obtained from code Q-5-44-0 were 0.200, as seen from the Kolmogorov-Smirnov test, because the data were more than 50. For codes J-3-13-0 and J-3-16-0, the Shapiro-Wilk tests showed p-values of 0.548 and 0.633, because the data were less than 50. From the three codes, the data were normally distributed because the results were >0.05, so the test used was the one-sample t-test.

Table 4. Correspondence of Average Real Costs and INA-CBGs Tariffs

INA-CBG Codes	Number of Patient Visits	Average Real Cost	INA-CBG rates	Normality Test	P (2-tailed)
Q-5-44-0	243	248.953	186.800	0.200 (normally distributed data)	<0.001
J-3-13-0	28	383.490	322.200	0.548 (normally distributed data)	0.01
J-3-16-0	19	406.506	540.000	0.633 (normally distributed data)	<0.001

From the results of the one-sample t-test, the data on the average real costs for pediatric asthma patients with code Q-5-44-0 differ significantly from the INA-CBG's rates, as indicated by a significance value <0.05. Pediatric asthma patients with the code J-3-13-0 show a difference in average real costs relative to INA-CBG rates, as indicated by a p-value < 0.05. Pediatric asthma patients with J-3-16-0 show a significant difference in average real costs, with INA-CBG's rates being significantly lower at $p < 0.05$. The results of the analysis showed that the average real costs in codes Q-5-44-0 and J-3-13-0 were higher than INA-CBG's rates, while code J-3-16-0 was lower. The one-sample t-test showed a significant difference between real costs and INA-CBG's rates across all codes, with a p-value < 0.05. The total real cost of treating pediatric asthma patients was IDR 78,956,904, while the total INA-CBG's rate was IDR 64,674,000, resulting in a negative difference of IDR 14,282,904 for the hospital.

Table 5. The Difference between the Total Real Costs and the Total INA-CBG's Tariff

INA-CBG's Code	n	Total Real Cost (Rp)	Total INA-CBG's Rates (Rp)	Price Difference (Rp)
Q-5-44-0	243	60.495.582	45.392.400	-15.103.182
J-3-13-0	28	10.737.707	9.021.600	-1.716.107
J-3-16-0	19	7.723.615	10.260.000	+2.536.385
Total	290	78.956.904	64.674.000	-14.282.904

These results are consistent with previous research, which reported a discrepancy between actual hospital costs and INA-CBG's rates for asthma patients. [6]. These cost differences can be influenced by medication use, supportive procedures such as nebulisers and spirometry, and medical services that exceed the INA-CBG claim rates. The discrepancy between actual treatment costs and INA-CBG's tariffs may be influenced by variations in medication utilisation, supportive procedures, and service intensity among patients. These findings indicate the need for continuous evaluation of healthcare cost management strategies to improve efficiency while maintaining quality of care. However, the present study did not assess factors such as clinical pathway implementation or provider adherence to treatment guidelines. Therefore, further studies are needed to investigate their potential impact on treatment costs and reimbursement conformity.

Electronic ISSN : 2656-3088
Homepage: https://www.journal-jps.com

Limitation of This Study

This study focused solely on direct medical costs. It did not analyse direct non-medical costs or indirect costs. Consequently, it did not examine the overall cost burden, only examining the burden on healthcare facilities.

Conclusions

Based on the results of a study of outpatient pediatric asthma patients at a public hospital in Yogyakarta from January 2024 to September 2025, the average real cost of treatment for INA-CBG code Q-5-44-0 was Rp248,953 ± 89,093, for code J-3-13-0 Rp383,490 ± 122,956, and for code J-3-16-0 Rp406,506 ± 111,846. The largest cost component across all groups was medication costs, indicating that pharmacological therapy is the primary driver of outpatient pediatric asthma treatment costs. Correspondence analysis showed that actual care costs for INA-CBG codes Q-5-44-0 and J-3-13-0 were significantly higher than the INA-CBG rates, resulting in a negative financial difference for the hospital. Conversely, actual care costs for code J-3-16-0 were significantly lower than the INA-CBG rates, resulting in a positive difference. These findings suggest that the concordance between actual costs and INA-CBG rates varies with the severity of the service and resource utilisation. Based on the study results, it is recommended to conduct further research to investigate whether implementing clinical pathways could reduce the cost discrepancy observed in this study.

Ethical Approval

This study received ethical approval from the Health Research Ethics Committee of RS Paru Respira Yogyakarta under approval number: (011/KEPK/V/2025). All patient data were anonymised before analysis to maintain confidentiality and privacy. Because this study used retrospective medical record data, no direct patient intervention was involved.

Conflict of Interest

The authors declare no conflict of interest regarding the publication of this manuscript.

Acknowledgment

The authors would like to express their sincere gratitude to Universitas Muhammadiyah Yogyakarta for the academic support provided throughout this research. The authors also thank RS Paru Respira Yogyakarta for facilitating this study.

References

[1] J. Putri, L. Naela Sangadah, N. Wiwin Mulyati, R. Fitriani, Upaya Peningkatan Pengetahuan tentang Penyakit Asma pada Masyarakat, Kolaborasi J. Pengabdi. Masy. 2 (2022) 132–140. https://doi.org/10.56359/kolaborasi.v2i2.80.

[2] K. Oktaviani, M. Sutrisna, Diaphragm Breathing Exercise Influence On Bronchial Asthma Attacks In Bengkulu City, J. Vokasi Keperawatan 4 (2021) 394–405.

[3] Peraturan Menteri Kesehatan Republik Indonesia Nomor 3 Tahun 2023 Tentang Standar Tarif Pelayanan Kesehatan Dalam Penyelenggaraan Program Jaminan Kesehatan. Jakarta: Kementerian Kesehatan Republik Indonesia; 2023.

[4] A. Lorensia, M.M.A. Jalmav, A.F. Amir, F.S. Anizzalati, Difference in Rill Costs With INA-CBGs Rates and Treatment Rationality of Inpatient Asthma Children, J. Trop. Pharm. Chem. 8 (2024) 123–135.

[5] F. Zaqiah, L.V.I. Dewi, S.B. Harsono, Analisis Cost of Illness pada Pengobatan Pasien Stroke Iskemik Peserta JKN di RS X Surakarta Tahun 2023, J. Mandala Pharmacon Indones. 10 (2024) 338–345. https://doi.org/10.35311/jmpi.v10i2.522.

[6] A. Lorensia, M.M. Jalmav, H. Sugeng, Analisis Biaya dengan Efektivitas dan Rasionalitas Pengobatan Serangan Asma di Rumah Sakit X Gresik, J. Sains dan Kesehatan(J. Sains Kes.) 6 (2024) 10–23.

Electronic ISSN : 2656-3088
Homepage: https://www.journal-jps.com

[7] A. Fadila, A. Patria, R.P. Haryanti, Faktor-Faktor Yang Berhubungan Dengan Kejadian Asma Pada Anak Di Ruang Anak Rsud Bob Bazar Kalianda, 8 (2024) 337–345.
[8] R. Shah, D.C. Newcomb, Sex Bias in Asthma Prevalence and Pathogenesis, 9 (2018) 1–11. https://doi.org/10.3389/fimmu.2018.02997.
[9] F. Tjira, H. Assagaf, T.M. Albaar, Korelasi Antara Usia dan Jenis Kelamin dengan Derajat Keparahan pada, 3 (2024) 4206–4216. https://doi.org/10.59141/comserva.v3i10.1206.
[10] A. Wahyudi, F.F. Yani, Erkadius, Hubungan Faktor Risiko terhadap Kejadian Asma pada Anak di RSUP Dr. M. Djamil Padang, http://Jurnal.fk.unand.ac.id 5 (2016) 312–318.
[11] A.M. Pratama, A. Lorensia, Profil Biaya Pengobatan Serangan Asma berdasarkan Kelas Rawat Inap, 16 (2021) 59–64.
[12] Y.T. Utami, N. Fanny, Faktor Penyebab Perbedaan Selisih Klaim Negatif Tarif Ina-Cbgs dengan Tarif Riil di RSUD Dr. Moewardi, J. Sains dan Kesehatan(J. Sains Kes.) 3 (2021) 492–499.
[13] Widiastuti, T.M., Andayani, R., Herowati, Analisis Biaya Medik Langsung dan Utilitas Pasien Asma Rawat Jalan di Rumah Sakit Umum Daerah Dr. Agoesdjam Hospital Ketapang, 14 (2023) 53–59.
[14] GINA, Global Initiative for Asthma Summary Guide for Asthma Management and Prevention (2025).
[15] IDAI, rekomendasi terapi inhalasi pada anak, Ikatan. Dr. Anak Indones. (2019).

Electronic ISSN : 2656-3088
Homepage: https://www.journal-jps.com