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THE EFFECTIVENESS OF COMMUNICATION, INFORMATION, AND EDUCATION ON PARENTAL KNOWLEDGE OF PEDIATRIC RESPIRATORY INFECTION PATIENTS AT JOHAN PAHLAWAN HEALTH CENTER

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Abstract

Acute Upper Respiratory Infections (ARI) are among the leading infectious diseases contributing significantly to global morbidity and mortality, particularly among children under five years of age. Each year, an estimated four million deaths of children under five are attributed to ARI. Successful management of ARI can be improved when caregivers possess adequate knowledge about the disease and the correct use of medications. One approach to strengthening the role of caregivers is through the provision of Communication, Information, and Education (CIE). This study aimed to evaluate the effectiveness of CIE in improving the knowledge of caregivers of pediatric ARI patients at the Johan Pahlawan Community Health Center, West Aceh Regency. This study employed a quantitative approach with a pre-experimental design. The total sample consisted of 33 respondents, including parents or caregivers of pediatric ARI patients who visited the Johan Pahlawan Community Health Center. Data analysis was conducted using univariate analysis to describe the distribution of respondents' knowledge levels and bivariate analysis using the Paired Sample t-test to assess the effectiveness of the CIE intervention. The results showed a p-value of 0.000 ($p < 0.05$), indicating a significant difference in knowledge levels before and after the CIE intervention. Therefore, it can be concluded that the provision of CIE is significantly effective in improving the knowledge of caregivers of pediatric ARI patients at the Johan Pahlawan Community Health Center, West Aceh Regency. Consequently, CIE should be implemented regularly and continuously as part of health promotion efforts to prevent and reduce the incidence of ARI among children.

Keywords: Effectiveness, Acute Respiratory Infection (ARI), Knowledge, Communication Information and Education (CIE), Parents of Pediatric Patients

INTRODUCTION

Acute Respiratory Infections (ARI) are infectious diseases that can affect both the upper and lower respiratory tracts and remain one of the most significant global and national public health issues. According to the World Health Organization (WHO, 2023), ARI is the leading infectious disease contributing to global morbidity and mortality, with an estimated four million deaths annually, of which 98% are caused by lower respiratory tract infections. The impact of this disease is most pronounced among vulnerable populations, such as infants, children, and the elderly, particularly in low- and middle-income countries. In 2024, the WHO reaffirmed that ARI continues to pose a serious health threat, with approximately 177 million new cases occurring annually among children under five years of age. More than 2.5 million deaths among children under five each year are attributed to ARI, with incidence rates in developing countries reported to be 40 to 80 times higher than those in developed countries. Indonesia is among the six countries with the highest number of ARI cases among children under five, with an estimated six million cases annually (Anggraini et al., 2025). In Indonesia, ARI cases in 2024 reached 1,387,650 cases (Ministry of Health of the Republic of Indonesia, 2025), with a prevalence of 9.3% according to the 2024 Basic Health Research (Riskesdas). Provinces with the highest prevalence include East Nusa Tenggara, Papua, Banten, West Nusa Tenggara, and Bali. These figures indicate that ARI remains an infectious disease requiring serious attention, particularly at the primary health care level. Similar conditions are observed in West Aceh Regency, especially in Johan Pahlawan District. Data from the Johan Pahlawan Community Health Center in 2024 recorded 1,478 ARI cases among pediatric patients, and although the number declined to 1,334 cases by June

2025, it remains relatively high. The Public Relations Office of the West Aceh District Health Office (2025) reported that Johan Pahlawan District has the highest number of ARI cases in the regency, partly due to suboptimal health promotion and community education efforts. Various factors contribute to the high incidence of ARI among children, including viral infections such as influenza, respiratory syncytial virus (RSV), and rhinovirus, which are primarily transmitted through droplets or direct contact. Environmental factors such as air pollution, exposure to cigarette smoke, poor household ventilation, and residential overcrowding also significantly increase the risk of ARI in children (Andriati et al., 2024). Therefore, promotive and preventive efforts are essential to reduce the incidence of ARI. One crucial strategy for ARI prevention is the delivery of Communication, Information, and Education (CIE). CIE aims to enhance public understanding of ARI signs and symptoms, risk factors, and preventive measures. Health education has been shown to change community behavior, increase awareness of ARI symptoms, and encourage parents to adopt preventive actions such as practicing clean and healthy living behaviors, improving home ventilation, washing hands, and avoiding pollution (Hidayati et al., 2023; Sulistiyan, 2024). Previous studies have also demonstrated that CIE significantly improves knowledge and reduces ARI incidence (Wulandari et al., 2025). Preliminary observations conducted among 10 respondents in Johan Pahlawan District revealed that 80% lacked adequate knowledge regarding the causes and prevention of ARI, including limited understanding of transmission risk factors, the importance of environmental hygiene, and simple preventive measures that can be implemented at home. This condition highlights the need to improve parental knowledge through structured and continuous Communication, Information, and Education (CIE). Most respondents perceived ARI as a mild illness and were unaware of the role of environmental factors in increasing the risk of ARI in children. This low level of knowledge indicates that CIE delivery by health professionals still needs to be strengthened and expanded.

Prevention of Acute Respiratory Infections (ARI) can be achieved through simple yet effective measures, including regular handwashing with soap and running water and reducing direct contact with individuals who are ill. Environmental hygiene should also be maintained by ensuring adequate ventilation, routine dust removal, and proper waste management. Wearing masks when coughing or sneezing and adhering to complete immunization programs are also crucial preventive measures. Additionally, maintaining immune system resilience through balanced nutrition, adequate rest, and regular physical activity contributes to ARI prevention (Muttaqin, 2021). Considering the persistently high prevalence of ARI and the low level of public knowledge regarding preventive measures, more structured and measurable educational interventions are required. Therefore, this study aims to assess the effectiveness of Communication, Information, and Education (CIE) in improving the knowledge level of pediatric patients' caregivers regarding ARI at the Johan Pahlawan Community Health Center, West Aceh Regency. The findings of this study are expected to provide insights into the role of CIE in enhancing parental or caregiver understanding and to support preventive efforts to reduce the incidence of ARI among children.

METHOD

This study applied a pre-experimental design using a one-group pretest-posttest approach, where measurements were taken twice from a single group of subjects to evaluate the impact of Communication, Information, and Education (CIE) on the knowledge of pediatric ARI patients. The initial measurement (pretest) was conducted before the intervention, while the final measurement (posttest) was conducted after the CIE intervention. The study was conducted at the Johan Pahlawan Community Health Center, West Aceh Regency, in October 2025. The total sample in this study consisted of 33 respondents, selected using random sampling to ensure population representation. Sample selection was based on inclusion criteria, including willingness to participate, the ability to read and write, and residence in Johan Pahlawan District. Exclusion criteria included unwillingness to participate, inability to read and write, and non-residence in the study area. Data collection was carried out using a questionnaire to obtain primary data on respondent characteristics as well as pretest and posttest results, while secondary data were obtained from the health center's administrative documents. Data analysis included univariate analysis to describe the variables of CIE delivery and knowledge levels, as well as bivariate analysis using t-tests through SPSS software to assess the effectiveness of the CIE intervention. Prior to hypothesis testing, data normality was tested using the Kolmogorov-Smirnov test with a significance level of 0.05.

RESULTS AND DISCUSSION

Descriptive data reflecting the respondents' conditions serve as supporting information to strengthen the research findings. In this study, respondents exhibited specific characteristics that were analyzed. The analyzed respondent characteristics included age, gender, and educational level. Data on these characteristics were obtained

from the respondents' answers to the distributed questionnaires. A description of the respondents' characteristics is presented as follows.

Table 1. Respondents' Characteristics

Characteristic	Category	Number	Percentage (%)
Age	< 25 Years	12	36,4
	25 - 35 Years	15	45,5
	> 35 Years	6	18,2
Gender	Male	0	0
	Female	33	100
Education	Low (SD - SMP)	*11*	*33,3*
	High (SMA - PT)	22	66,7

Sumber: Data Primer 2025

Based on the respondent characteristics table, the majority of parents of ARI patients are between 25 and 35 years old, with 15 respondents (45.5%). Respondents under 25 years old consist of 12 people (36.4%), while the age group over 35 years has the smallest proportion, with 6 people (18.2%). In terms of gender, all respondents are female, totaling 33 people (100%), with no male respondents. The findings of this study indicate that mothers play the primary role in supporting children during treatment at the health center. Regarding education, most respondents have higher education, with 22 people (66.7%) having completed high school to university, while 11 respondents (33.3%) have a lower education level (SD–SMP).

Uji Instrumen

1. Validity Test

Tabel 1. Hasil Uji Validitas

Item	Rhitung	**Description**
Statement 1	0,707 > 0. 3610	Valid
Statement 2	0,886 > 0. 3610	Valid
Statement 3	0,820 > 0. 3610	Valid
Statement 4	0,922 > 0. 3610	Valid
Statement 5	0,886 > 0. 3610	Valid
Statement 6	0,927 > 0. 3610	Valid
Statement 7	0,871 > 0. 3610	Valid
Statement 8	0,857 > 0. 3610	Valid
Statement 9	0,857 > 0,3610	Valid
Statement 10	0,927 > 0,3610	Valid

Source: Primary Data, 2025

Based on the results of the research instrument testing, it can be stated that all variables measured using 10 statement items are considered valid. This is evidenced by the correlation coefficient values of each item exceeding the critical value of the product-moment correlation, which is 0.3610. Therefore, all statements in this research questionnaire are deemed valid and can be applied for further analysis.

2. Reliability Test

The reliability of the instrument was evaluated using Cronbach's alpha coefficient, where values closer to 1 indicate a higher level of reliability. Instruments with a Cronbach's alpha value below 0.60 are considered unreliable, while values above 0.60 are acceptable and indicate good reliability. The results of the reliability test show that all statement items have a Cronbach's alpha value of 0.958, which exceeds the minimum threshold of 0.60. Thus, it can be concluded that all statement items in this research questionnaire demonstrate very high reliability and consistency in measuring the research variables.

Univariate Analysis

Univariate analysis in this study was conducted on two variables, namely the delivery of Communication, Information, and Education (CIE) and the level of understanding of pediatric patients with Acute Respiratory Tract Infections (ARTI). The results of the univariate analysis are presented as follows:

Table 2. Percentage Distribution of CIE Delivery and Respondents' Level of Knowledge

Level of Knowledge	Pretest		Postest	
	Frequency	%	Frequency	%
Poor	2	6,1	-	-
Moderate	22	66,7	7	21,2
Good	9	27,3	26	78,8

Source: Primary Data, 2025

Based on the distribution table of respondents' level of knowledge, it is known that prior to the Communication, Information, and Education (CIE) intervention (pretest), the majority of respondents were in the moderate knowledge category, totaling 22 individuals (66.7%). Respondents with a good level of knowledge amounted to 9 individuals (27.3%), while the poor knowledge category constituted the smallest proportion, with only 2 individuals (6.1%). After the implementation of the CIE intervention (posttest), there was an improvement in respondents' level of knowledge, with the majority of respondents falling into the good knowledge category, totaling 26 individuals (78.8%). There were 7 respondents with a moderate level of knowledge (21.2%), and no respondents were found in the poor knowledge category. These findings indicate an increase in the knowledge level of parents of patients with Acute Respiratory Tract Infections (ARTI) after the provision of CIE, suggesting that the Communication, Information, and Education intervention was effective in improving respondents' understanding.

Bivariate Analysis

The normality test of the research data was conducted using the Kolmogorov–Smirnov test through the SPSS application to assess the appropriateness of the hypothesis testing. The results of the normality test are presented in the following table:

Table 3. Normality Test
One-Sample Kolmogorov-Smirnov Test

		Pengetahuan Pretest	Pengetahuan Postest
N		33	33
Normal Parameters[a,b]	Mean	1,21	1,79
	Std. Deviation	,545	,415
Most Extreme Differences	Absolute	,379	,483
	Positive	,379	,305
	Negative	-,288	-,483
Kolmogorov-Smirnov Z		2,175	2,776
Asymp. Sig. (2-tailed)		,152	,210

a. Test distribution is Normal.
b. Calculated from data.
Source: Primary Data, 2025

Based on the results of the normality test using the One-Sample Kolmogorov–Smirnov Test, the significance values (Asymp. Sig. 2-tailed) were 0.152 for the pretest knowledge data and 0.210 for the posttest knowledge data. Since the significance values of both variables exceed $\alpha = 0.05$, it can be concluded that the respondents' knowledge data before and after the CIE intervention are normally distributed. Therefore, the data meet the criteria for conducting parametric statistical tests to analyze differences in respondents' levels of knowledge. To examine the difference in the level of understanding before and after the Communication, Information, and Education (CIE) intervention, the analysis was performed using a Paired Sample t-Test. This test was selected because the data were obtained from the same group of respondents measured at two different time

points, namely before (pretest) and after (posttest) the implementation of CIE. The purpose of this test was to determine whether there was a significant difference in the mean level of knowledge before and after the intervention.

Table 4. Results of the Paired Sample t-Test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Posttest Knowledge – Pretest Knowledge	,576	,561	,098	,377	,775	5,899	32	,000

Source: Primary Data, 2025

Based on the results of the Paired Sample t-Test, the calculated t-value was 5.899 with 44 degrees of freedom (df), and the significance value (Sig. 2-tailed) was 0.000. Since the significance value is lower than 0.05 ($p < 0.05$), it can be concluded that there is a significant difference in respondents' levels of knowledge before and after the provision of Communication, Information, and Education (CIE). These findings indicate that the CIE intervention was proven to be significantly effective in improving the understanding of pediatric patients regarding Acute Respiratory Tract Infections (ARTI) at Johan Pahlawan Public Health Center, West Aceh Regency. This study demonstrates that following the CIE intervention, there was a significant improvement in respondents' knowledge levels, shifting from the "moderate" category to the "good" category, while the number of respondents with "poor" knowledge decreased to zero. These results are consistent with findings from a meta-analysis indicating that educational interventions significantly increase knowledge related to respiratory infection prevention (OR 2.82; 95% CI 1.70–4.69) (Linhares et al., 2022). Therefore, the CIE intervention implemented in this study can be considered effective in facilitating improved understanding among patients and/or their families regarding ARTI.

Furthermore, it is important to discuss the mechanisms underlying the strong impact of educational interventions. Health education delivered through effective communication, relevant information, and interactive educational methods enables improvements in knowledge, which may subsequently influence attitudes and practices. For instance, a study conducted in Vietnam using a health promotion model to educate mothers about ARTI demonstrated significant increases in knowledge, attitudes, and practices (from 15.7% to 85.3%) in the intervention group compared to the control group (Arman et al., 2024). This supports the notion that systematic CIE interventions are capable of facilitating positive behavioral change. More specifically, in the context of pediatric ARTI, several studies in Indonesia have shown that parental or family knowledge is a crucial factor in the prevention and management of this infection. For example, a correlational study conducted in Pontang revealed that higher parental knowledge was associated with more effective ARTI prevention efforts among toddlers (Sandi Tunny et al., 2020). Accordingly, increasing knowledge through CIE represents one of the primary pathways to reducing the risk of ARTI and its complications.

From a practical perspective, the findings of this study suggest that the CIE intervention implemented at Johan Pahlawan Public Health Center may serve as a model for routine health promotion programs. CIE can be integrated into regular public health center activities, such as health counseling sessions, educational videos, direct interactions with patients and families, and even the use of digital media. This is supported by a study conducted in Maluku, which found that video-based education significantly increased maternal knowledge ($p = 0.000$) in a pre-experimental study (Qur'aniati et al., 2022). Such simple yet systematic educational products have been proven to be effective. However, it is also important to acknowledge that this study reveals the reality that prior to the intervention, there were still respondents with "poor" knowledge (6.1%). This finding indicates that although the majority of respondents were already in the "moderate" category, there remains a subgroup with knowledge gaps that require special attention. Targeted efforts for this group may involve more intensive or personalized educational approaches.

From a methodological standpoint, the Kolmogorov–Smirnov normality test results indicated that respondents' knowledge data at both pretest and posttest were normally distributed, with significance values of 0.152 and 0.210, respectively ($p > 0.05$). Having met the assumption of normality, the analysis of differences in knowledge levels before and after the CIE intervention was appropriately conducted using a parametric statistical test, namely the paired t-test. These results provide quantitative evidence that the CIE intervention significantly influenced knowledge improvement. This finding aligns with previous studies demonstrating that knowledge enhancement through maternal education and healthcare worker training not only improves understanding but may also reduce the frequency of ARTI or related complications in children. For example, a study in Malaysia reported that similar interventions successfully reduced the incidence of severe ARTI among children under five years of age (Sari et al., 2023).

From a theoretical perspective, increased knowledge represents the initial stage in health behavior models such as the Health Belief Model or the Theory of Planned Behavior, which is subsequently expected to promote changes in attitudes and preventive behaviors (e.g., improving household ventilation, handwashing practices, avoiding cigarette smoke exposure, and ensuring immunization). Supporting literature indicates that insufficient knowledge is a risk factor for ARTI; for instance, a study conducted in East Nusa Tenggara found that maternal knowledge had a significant effect on ARTI incidence ($p = 0.010$), further reinforcing the relevance of the present findings (Wulandari & Kholid, 2025).

Nevertheless, this discussion must also acknowledge certain limitations and challenges. For example, the study did not directly measure behavioral changes or reductions in ARTI incidence, but focused solely on knowledge outcomes. To ensure that increased knowledge translates into actual behavioral change and reduced ARTI incidence, further research employing longitudinal measurements or disease outcome evaluations is required. Meta-analytical evidence also suggests that while most studies report improvements in knowledge, the effects on disease incidence are often underreported (Hanastasyia et al., 2024).

Future directions should include expanding the scope of the intervention, such as involving parents or caregivers more actively in educational activities, conducting follow-up assessments to evaluate knowledge retention, and examining changes in attitudes, behaviors, and clinical outcomes (e.g., reductions in ARTI cases, outpatient visits, or hospitalizations). Overall, this study demonstrates that the implementation of CIE at Johan Pahlawan Public Health Center, West Aceh Regency, resulted in a significant increase in knowledge among pediatric ARTI patients. These findings are highly consistent with both international and national literature that positions education as a key strategy in the prevention and management of ARTI. It is therefore recommended that this CIE program be institutionalized as a routine component of public health center services, accompanied by periodic evaluation and expansion to behavioral and clinical outcome measures to achieve a greater impact on ARTI control within the service area of Johan Pahlawan Public Health Center.

Conclusion

The results of this study indicate that the implementation of Communication, Information, and Education (CIE) was effective in improving the knowledge of pediatric patients regarding Acute Respiratory Tract Infections (ARTI) at Johan Pahlawan Public Health Center, West Aceh Regency. Prior to the intervention, the majority of respondents had a moderate level of knowledge (66.7%). Following the provision of CIE, a significant improvement was observed, with most respondents reaching a good level of knowledge (78.8%), and no respondents remaining in the poor knowledge category. The results of the Paired Sample t-Test showed a p-value of 0.000 ($p < 0.05$), indicating a statistically significant difference in knowledge levels before and after the intervention. These findings demonstrate that CIE plays an effective role in enhancing the knowledge of patients and their families regarding the prevention and management of Acute Respiratory Tract Infections (ARTI). Therefore, CIE can serve as a significant educational strategy in supporting health promotion and preventive efforts in pediatric healthcare services, particularly at the primary care level such as public health centers.

Recommendations

1. For Johan Pahlawan Public Health Center
   It is recommended that the Communication, Information, and Education (CIE) program be implemented regularly and systematically as part of the health promotion activities at the health center. Health workers can integrate CIE into pediatric clinic services, posyandu (integrated health service posts), and home visits. In addition, the health center can develop engaging educational media, such as educational videos, to make

health messages easier for patients and families to understand. Training for healthcare personnel on effective communication techniques should also be conducted to enhance the quality of information delivery.

2. For Pediatric Patients and Their Families
   Patients and families are encouraged to actively seek information about Acute Respiratory Tract Infections (ARTI) from reliable sources and to consistently apply the knowledge gained from CIE activities in daily life. Parents are expected to adopt preventive behaviors, such as maintaining a clean environment, avoiding exposure to cigarette smoke, ensuring proper child nutrition, and following the recommended immunization schedule. Active family involvement in health education activities will have a significant positive impact on the overall health of children.

REFERENCES

Andriati, R., Pratiwi, R. D., Lutvianty, D., Darmayanti, D., & Puspita, R. R. (2024, April). Efektivitas Health Education Tentang Infeksi Saluran Pernapasan Akut (ISPA) Terhadap Tingkat Pengetahuan Lingkungan Dan Sikap Pada Orang Tua Di UPT Puskesmas Jampang Telaga Kahuripan Parung Bogor. In *Prosiding Semlitmas (Seminar Hasil Penelitian Dan Pengabdian Masyarakat)* (Vol. 1, No. 1, pp. 25-43).

Anggraini, N. A., Ambarika, R., & Katupu, N. N. (2024). Factors Influencing the Incident of Acute Respiratory Tract Infections in Children Aged 12-59 Months in Wallandimu East Nusa Tenggara. *Journal Of Nursing Practice*, *8*(1), 197-206.

Arman, İ. H., Temel Aslan, K., Arman, Y., & Apaydın Kaya, Ç. (2024). A Quasi-Experimental Controlled Educational Intervention for Mothers to Reduce Unnecessary Emergency Department Admissions in Children with Respiratory Tract Infection Symptoms. Konuralp Medical Journal, 16(1), 1–10.

Hanastasyia, N., Aisyah, I., & Lindayani, E. (2024). Correlation between Parental Knowledge of Acute Respiratory Infection with Preventive Efforts Acute Respiratory Infection in Toddlers. Jurnal Keperawatan Florence Nightingale, 7(1), 255–261.

Kementrian Kesehatan RI. (2025). *Profil Kesehatan Indonesia.* Jakarta: Kementrian Kesehatan RI.

Linhares, F. M. P., Abreu, W. J. C. D., Melo, P. D. O. C., Mendes, R. C. M. G., Silva, T. A. D., Gusmão, T. L. A. D., & Guedes, T. G. (2022). Effectiveness of educational interventions in knowledge, attitude, and practice for preventing respiratory infections: a systematic review and meta-analysis. *Revista Brasileira de Enfermagem*, *75*, e20210522.

Muttaqin. (2021). *ISPA (Gangguan Pernapasan Pada Anak)*. Yogyakarta: Huha Medika

Qur'aniati, N., Ni'mah, L., & Putri, D. A. E. (2022). Determinants of Acute Respiratory Infection (ARI) among Children aged 6–35 months in Indonesia. *Pediomaternal Nursing Journal*, 8(2).

Sandi Tunny, I., Soamole, I., Agung Wibowo, S., & Purnamasari, I. (2020). Effect of Health Education on Mothers' Knowledge in the Prevention of Acute Respiratory Infection in Toddlers in Waimital Village, Maluku. *Jurnal Ners*, 15(1 Sp), –.Universitas Airlangga

Sari, Y. I. P., Martawinarti, R. N., Juniana, M., Lukman, M. N., Santi, L. D., Aulia, E. S., ... & Azizi, P. D. (2023). Pendidikan Kesehatan Pencegahan ISPA (Infeksi Saluran Pernafasan Akut). *Jurnal Pengabdian Masyarakat Jurusan Keperawatan*, *1*(2), 10-15.

World Health Organization. (2023). *Acute respiratory infections (ARI): Situation and trends.* WHO

Wulandari, D. E., & Kholid, A. (2025). Gambaran Manajemen Kesehatan Tidak Efektif melalui Edukasi Kesehatan pada Keluarga Anak Usia Sekolah dengan Infeksi Saluran Pernafasan Akut (Studi Kasus). *Jurnal Keperawatan Berbudaya Sehat*, 3(2), 67–72.