

## The Effect of Health Promotion Through Leaflet Media on Mothers' Behavior Regarding ARI (Acute Respiratory Infection) in Children

### Pengaruh Promosi Kesehatan Melalui Media Leaflet Terhadap Perilaku Ibu tentang ISPA pada Anak

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#### ABSTRACT

Based on preliminary interviews with mothers of children suffering from acute respiratory infection (ARI), which is an inflammation that affects the throat, nose, and lungs, it was found that many parents still lack a clear understanding of the disease. Initial interviews with mothers at the Southeast Sulawesi Police Clinic, revealed that many parents lack a clear understanding of the disease. This study aims to determine the effect of health promotion through leaflets on mothers' behavior regarding ARI in children at the clinic. This experimental study used a one-group pretest-posttest design. The population consisted of 49 respondents, and a sample of 33 was selected using accidental sampling. Data were analyzed using a paired-sample t-test. The results showed a significant improvement in mothers' knowledge, attitudes, and actions concerning ARI in children at the Southeast Sulawesi Police Clinic before and after health promotion using leaflet media. It is hoped that mothers will become more proactive in seeking information about ARI prevention and treatment and will participate in health education activities organized by healthcare facilities.

**Keywords:** Health promotion, leaflet media, knowledge, attitude, practice

#### ABSTRAK

ISPA merupakan peradangan yang menyerang bagian tenggorokan, hidung, dan paru-paru. Berdasarkan hasil wawancara awal pada ibu yang anaknya penderita ISPA di Klinik Polda Sultra ditemukan bahwa masih banyak orangtua yang belum mengetahui secara jelas tentang penyakit ISPA. Penelitian ini bertujuan untuk mengetahui pengaruh promosi kesehatan melalui media leaflet terhadap perilaku ibu tentang ISPA pada anak di Klinik Polda Sultra. Jenis penelitian ini adalah eksperimen dengan rancangan yang digunakan adalah "One Group Pretest-Posttest Design". Populasi sebanyak 49 responden, sampel sebanyak 33 responden dengan teknik penarikan sampel secara *accidental sampling*. Analisis data menggunakan uji T 2 sampel berpasangan (*paired sampel T-Test*). Hasil penelitian menunjukkan ada pengaruh yang signifikan sebelum dan sesudah promosi kesehatan dengan media leaflet terhadap pengetahuan, sikap dan tindakan ibu tentang ISPA pada anak di Klinik Polda Sultra. Diharapkan kepada para ibu untuk lebih aktif mencari informasi tentang pencegahan dan penanganan ISPA, serta mengikuti kegiatan edukasi kesehatan yang diselenggarakan oleh fasilitas pelayanan kesehatan.

**Kata Kunci:** Promosi kesehatan, media leaflet, pengetahuan, sikap, tindakan

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## INTRODUCTION

Acute Respiratory Infections (ARIs) are one of the leading causes of hospitalization in children worldwide. According to the World Health Organization (WHO), nearly 20% of all child deaths globally are caused by ARI. ARI has the potential to develop into an epidemic or even a pandemic. This situation triggers public health concerns that impact the entire international community. ARI groups, such as severe acute respiratory syndrome (SARS), avian influenza (H5N1) in humans, and newly emerging, unreported ARI cases, have resulted in outbreaks that threaten high morbidity and mortality rates in the general population.<sup>1</sup>

According to the 2023 Indonesian Basic Health Research, the incidence of ARI in children has increased, accounting for 20–30% of all deaths. According to data obtained from the Ministry of Health's Health Profile in 2024, the prevalence of ARI in Indonesian children was 3.55%, accounting for 7,639,507 cases out of a total of 21,578,724.<sup>2</sup>

In 2021, the prevalence of ARI cases in children in Southeast Sulawesi Province was 35.2%. Konawe Regency had the highest prevalence at 85.04%, and North Konawe Regency had the lowest at 0.87%. In 2022, there was a significant decrease in ARI cases, amounting to 13.01%. Konawe Regency recorded the highest prevalence at 81.06%, while North Kolaka Regency recorded the lowest at 0.61%. In 2023, the prevalence was 4.24%. Konawe Regency had the second highest prevalence, at 8.69%, after Konawe Islands Regency, which had

the highest prevalence, at 10.18%. North Konawe Regency had the lowest prevalence, at 0.13%.<sup>3</sup>

A location survey was conducted in six community health centers (Puskesmas) in Kendari City, which were distributed according to cardinal directions. The East Puskesmas (Kandai, 2024) recorded 291 cases (2.33%), the West Puskesmas (Puuwatu, 2024) recorded 523 cases (60.4%), the North Puskesmas (Labibia, 2024) recorded 309 cases (8.58%), the South Puskesmas (Lepo-lepo, 2024) recorded 380 cases (17.5%), the Southeast Puskesmas (Poasia, 2024) recorded 188 cases (3.91%), and the Central Kendari Puskesmas (Perumnas, 2024) recorded 102 cases (7.24%). Meanwhile, the Southeast Sulawesi Regional Police (Polda Sultra) clinic recorded 131 ARI cases in children in 2022, 211 in 2023, and 249 in 2024.<sup>4</sup>

ARI is an inflammation that affects the throat, nose, and lungs. It is among the top ten most commonly reported diseases at community health centers and hospitals. Early symptoms include fever, sore throat, runny nose, and cough (dry or productive). ARI may be caused by various bacteria, such as Streptococcus, Staphylococcus, Pneumococcus, Hemophilus, Bordetella, and Corynebacterium. Additionally, viruses such as Microvirus, Adenovirus, Coronavirus, Picornavirus, and Herpesvirus can cause ARI.<sup>5</sup>

Behavior refers to a person's actions or responses to situations in their surroundings. Depending on the situation encountered, this action can be conscious or unconscious. In daily life, human behavior is influenced by various factors, including environment, experience,



education, culture, psychological state, and biology. In the context of health, behavior plays a significant role in disease prevention and treatment. For example, maternal behavior plays an important role in handling acute respiratory infections (ARI) in children. How quickly and effectively a child recovers from ARI depends on a mother's response to her child's symptoms, her decision-making regarding treatment, and her efforts to maintain environmental hygiene and health.<sup>6</sup>

Knowledge-based behavior has positive impacts, such as disease prevention and optimal care. Conversely, inappropriate behavior, such as ignoring symptoms or providing incorrect treatment, can worsen the child's condition.<sup>7</sup> Inadequate preventive measures are also an issue in how mothers handle ARI. Better education about ARI symptoms, treatment, and prevention is essential so mothers can provide proper care for their children. With increased awareness and understanding, the incidence of ARI in children is expected to decrease, allowing children to grow healthier.<sup>5</sup>

One factor influencing the occurrence of Acute Respiratory Infections (ARI) in children is behavior, in which knowledge plays an important role. Health promotion programs can be used to improve maternal knowledge about ARI prevention in children. Knowledge is the understanding or information an individual possesses about a subject, obtained through experience, learning, observation, or education. Knowledge encompasses facts, concepts, theories, principles, and skills. Knowledge involves not

only learned information, but also the ability to apply, analyze, and solve problems based on existing information. Knowledge greatly influences behavior. The more a person knows about a subject, the more likely they are to take appropriate action or avoid unwanted risks.<sup>8</sup>

In addition to knowledge, attitude influences ARI incidence in children because it is a predisposition to act, think, and feel a certain way toward an object or situation. Attitudes reflect how people view or respond to their surroundings and are usually shaped by experience, education, or social influence. Attitudes can be positive or negative and affect behavior in various aspects of life. For instance, one's attitude toward ARI prevention is shaped by knowledge, personal experience, social norms, and culture. Attitudes play an important role in how a person acts or reacts to ARI prevention in general.<sup>9</sup>

Problems related to maternal actions regarding Acute Respiratory Infections (ARI) in children often involve a lack of knowledge, awareness, and access to adequate health services. Common issues include failing to differentiate between mild and severe ARI, which can lead to neglect or overreaction, as well as administering medication without consulting a healthcare professional, such as giving antibiotics without a prescription. Other issues include using unproven traditional remedies that may worsen the child's condition, failing to avoid exposure to cigarette smoke, dust, or pollution, which can aggravate ARI, and providing inadequate nutrition to boost the child's immunity. These issues underscore the importance of maternal education about ARI,



improved access to healthcare, and better environmental conditions to safeguard children from the disease.<sup>10</sup>

Knowledge and attitudes are closely interrelated. Accurate knowledge about ARI can shape positive attitudes. In health promotion, promotional media serve as tools for disseminating health information through effective communication. When selecting the medium, differences in individuals' ability to absorb information from promotional media should be considered, as each method has its advantages and disadvantages. Health education can promote behavioral change in mothers regarding ARI in children. These activities aim to promote a healthy lifestyle.<sup>10</sup>

Health education is an educational activity that involves spreading messages and instilling beliefs. The goal is to make the community aware, knowledgeable, and understanding of health issues, and willing and able to follow recommendations related to health. One way to change behavior is through health education using leaflets.<sup>11</sup> Health education targeting various groups focuses more on those at the Southeast Sulawesi Regional Police (Polda Sultra) clinic. A leaflet is a printed informational medium on a sheet of paper. Its purpose is to disseminate information. Attractive health education media can help the target audience better understand health messages.<sup>12</sup>

An initial interview with mothers whose children had acute respiratory infection (ARI) at the Polda Sultra Clinic on January 20, 2025, revealed that many parents still do not clearly

understand the disease. This is because not all parents receive adequate information about ARI in children, including its causes, symptoms, and prevention methods. Additionally, health education is often unevenly distributed, and access to health facilities is limited. Some parents also believe that ARI symptoms, such as coughing, a runny nose, or a fever, are merely "common colds" that do not require medical attention. This misconception leads them to underestimate the disease even though it can progress to serious illnesses, such as pneumonia, if not treated properly. This lack of understanding makes them likely to ignore the disease, hence the need for follow-up measures, one of which is health promotion. Leaflets are an effective medium because they can reach many people, are easy to reread, and can present concise information.

## MATERIALS AND METHODS

This research is an experimental study. A one-group pretest-post-test design was used, in which a pretest was conducted before the intervention. The study took place from May to June of 2025 at the Southeast Sulawesi Regional Police (Polda Sultra) Clinic. The study population consisted of all mothers who brought their children for treatment of acute respiratory infection (ARI), as diagnosed by a doctor at the clinic, within the last three months, totalling 49 people. The sample comprised 33 respondents who were selected using simple random sampling. Data were analysed using a t-test.



## RESULTS

Table 1 shows that respondents' ages varied. Of the 33 respondents, the largest proportion was in the <12 years category (12 respondents, or 36.4%), while the smallest proportion was in the >12 years category (21 respondents, or 62.6%). Thirteen respondents (39.4%) were male, and 20 respondents (60.6%) were female.

**Table 1. Distribution of Respondents' Characteristics Based on Child's Age, Parents' Age, and Gender at the Sultra Police Clinic**

Respondent Characteristics	n	%
<b>Child's age (years)</b>		
< 2 years old	12	36.4
> 2 years old	21	63.6
<b>Age of the child's parents</b>		
> 30 years old	17	51.5
< 30 years old	16	48.5
<b>Gender</b>		
Man	13	39.4
Woman	20	60.6
<b>Amount</b>	<b>99</b>	<b>100</b>

Source: Primary Data, June 2025

Table 2 presents the results of the univariate analysis. Out of 33 respondents, 14 (42.4%) were in the "moderate" category and 19 (57.6%) were in the "poor" category before the health promotion. After the health promotion, 32 respondents (97%) were in the "moderate" category, while one respondent (3%) remained in the "poor" category. The mean knowledge score increased from 49.39 before the health promotion to 72.62 after the intervention.

Regarding attitude, prior to the health promotion, 11 respondents (33.3%) had a "moderate" attitude, while 22 respondents (66.7%) had a "poor" attitude. Afterward, 32 respondents (97.0%) had a "moderate" attitude, while one respondent (3.0%) remained in the "poor" category. The mean attitude score increased from

47.58 to 76.36.

Regarding practices, prior to the health promotion, 14 respondents (42.4%) had "moderate" practices, while 19 respondents (57.6%) had "poor" practices. Afterward, 32 respondents (97%) had "moderate" practices, and one respondent (3%) remained in the "poor" category. The mean practice score increased from 50.61 to 73.33.

Table 3 presents the bivariate analysis. The results show that the mean difference in knowledge scores before and after health promotion using leaflets was -23.030. The statistical test results indicated a significance value of 0.000 ( $p < 0.05$ ). The analysis produced a t-count of -10.483 and a t-table value of 1.692; t-count is less than t-table. Therefore, it can be concluded that the health promotion using leaflet media significantly affected mothers' knowledge about Acute Respiratory Infections (ARI) in children at the Polda Sultra Clinic.

The table also shows that the mean difference in attitude scores before and after the health promotion was -28.788. The statistical test results indicated a significance value of 0.000 ( $p < 0.05$ ). The analysis produced a t-count of -12.335 and a t-table value of 1.692, where t-count < t-table. Therefore, it can be concluded that there was a significant effect on mothers' attitudes toward ARI in children at the Polda Sultra Clinic before and after the health promotion using leaflet media.

Furthermore, the mean difference in practice scores before and after the health promotion was -22.727. The statistical test results indicated a significance value of 0.000 ( $p < 0.05$ ). The



analysis produced a t-count of -8.229 and a t-table value of 1.692, where t-count < t-table. It can be concluded that there was a significant effect on

mothers' practices related to ARI in children before and after the health promotion using leaflet media at the Polda Sultra Clinic.

**Table 2. Univariate Analysis of Respondents Based on Knowledge, Attitude, and Practice at Sultra Police Clinic**

Variabel	Knowledge ( <i>Pre Test</i> )		Knowledge ( <i>Post Test</i> )	
	n	%	n	%
Enough	14	42.4	32	97.0
Not enough	19	57.6	1	3.0
	Attitude ( <i>Pre Test</i> )		Attitude ( <i>Post Test</i> )	
Enough	11	33.3	32	97.0
Not enough	22	66.7	1	3.0
	Action ( <i>Pre Test</i> )		Action ( <i>Post Test</i> )	
Enough	14	42.4	32	97.0
Not enough	19	57.6	1	3.0
<b>Amount</b>	<b>33</b>	<b>100</b>	<b>33</b>	<b>100</b>

Source: Primary Data, 2025

**Table 3. Bivariate Analysis of the Effect of Health Promotion through Leaflets on Mothers' Attitudes toward Acute Respiratory Infections in Children at the South east Asia Police Clinic**

Variabel	Paired Differences					t	Sig. (2 Tailed)
	Mean	SD	SE	95% Confidence Interval of the Difference			
				Lower	Upper		
Knowledge Before and After	-23.030	12.621	2.197	-27.505	-18.555	-10.483	0,000
Attitude Before and After	-28.788	13.407	2.334	-33.542	-24.034	-12.335	0,000
Actions Before and After	-22.727	15.865	2.762	-28.353	-17.102	-8.229	0,000

Source: Primary Data, 2025

## DISCUSSION

Knowledge is the result of a person using their senses toward a particular object. According to the Kamus Besar Bahasa Indonesia (Indonesian Dictionary), knowledge is defined as understanding gained through seeing, being convinced, feeling, or experiencing something firsthand. Therefore, knowledge refers to everything a person learns about an object after receiving stimulation from external sources through the five senses. Based on the research results, it was found that, before the health promotion, mothers' knowledge about Acute

Respiratory Infection (ARI) in children was mostly in the poor category. This is because most respondents had never received counseling or adequate information about ARI. Consequently, some respondents still did not understand that children under three years old are more susceptible to coughs and colds than older children. They also did not realize that coughs and colds spread when someone coughs, sneezes, or talks and that cigarette smoke and vehicle emissions are harmful and can contribute to respiratory illness. Additionally, a lack of experience caring for



children with ARI influenced the low level of knowledge. Another factor contributing to mothers' lack of understanding of the importance of prevention and proper management was insufficient attention to early symptoms and prompt treatment of ARI.<sup>15</sup>

After the health promotion activity, most mothers' knowledge of ARI in children improved to the "fair" category. This improvement is due to the health promotion activity, which provided easily understandable information. The educational material delivered via leaflet used simple language, making it easier for mothers to understand the causes, symptoms, prevention methods, and initial treatment of ARI in children.

The increase in knowledge was also influenced by mothers' active involvement during the health promotion session, such as participating in the Q&A. This allowed for a two-way learning process.<sup>16</sup> Improving mothers' knowledge through health promotion, counseling, and access to information is an effective strategy for reducing the incidence of ARI, particularly among toddlers, who are the most vulnerable group. Effective health promotion can significantly increase public knowledge when it is delivered interactively, repeatedly, and tailored to the target audience's needs and educational levels. As mothers' knowledge increases, better attitudes and behaviors in childcare are expected to develop, thereby helping to reduce ARI incidence.<sup>17</sup>

Knowledge is a primary factor influencing an individual's health behavior. Adequate knowledge fosters positive attitudes, encouraging individuals to engage in behaviors that support health, such as

maintaining a clean environment, ensuring good home ventilation, avoiding exposure to cigarette smoke, and providing optimal nutrition for children. These behaviors are consistent with findings that low maternal knowledge often causes delayed ARI treatment in toddlers.<sup>14</sup>

An attitude is a readiness or willingness to act, but not the execution of a specific motive. Rather than an action or activity, attitude is a closed reaction, not overt behavior. It represents a readiness to respond to objects in a specific environment, forming a perception of that object.<sup>17</sup>

According to the research results, before the health promotion (Pre-Test), mothers' attitudes toward acute respiratory infections (ARI) in children were mostly in the poor category. This was due to their low level of knowledge about ARI, which directly impacted their perspective on and response to prevention and treatment efforts.

A person's attitude is strongly influenced by their understanding of an issue. When knowledge is limited, there is a higher tendency to consider ARI a mild illness that does not require serious treatment.<sup>18</sup> This includes habits such as taking children to dusty or poorly ventilated environments and having low awareness of the need to seek healthcare when early ARI symptoms appear. Poor communication between mothers and healthcare providers also hindered the development of better attitudes. Attitudes are shaped through learning, experience, and understanding of received information, and do not form instantly. Therefore, mothers' poor attitudes toward ARI before health promotion reflects the



need for increased knowledge and an active engagement in child health education.<sup>19</sup>

After the health promotion, most mothers' attitudes improved to the "fair" category. This was due to the health promotion successfully influencing their perspectives and awareness of the importance of Acute Respiratory Infection (ARI) prevention and treatment in children. The educational material was written in an easy-to-understand language and supported by interactive methods, such as discussions and Q&A sessions. This approach helped mothers gain knowledge and begin to develop positive attitudes toward child healthcare efforts.<sup>18</sup> Good attitudes usually form after individuals understand the benefits and risks of an action. In this case, the mothers realized that ARI is not a minor illness to be ignored and that early treatment is essential to prevent complications. Their emotional involvement with their child's health also served as a strong motivating factor in changing their attitudes for the better. Changes in community health attitudes are greatly influenced by the communication approaches used in health promotion.<sup>20</sup>

The findings of this study align with research showing significant changes in mothers' attitudes toward ARI prevention after receiving health promotion. The previous study found that, before receiving education, most respondents exhibited passive attitudes toward ARI prevention. After counseling, however, 94.1% of mothers demonstrated more caring and responsive attitudes toward their children's health, including ensuring proper home ventilation, avoiding exposure to

cigarette smoke, and seeking healthcare when ARI symptoms appeared.<sup>21</sup>

However, an attitude does not automatically translate into action. For an attitude to manifest as concrete behavior, supporting factors or enabling conditions are required, such as access to facilities. In addition to facilities, support from others, such as parents, relatives, and spouses, plays an important role in encouraging action.<sup>22</sup>

Based on the research results, mothers' actions regarding ARI in children before the health promotion were mostly in the poor category. This was due to some mothers not understanding the appropriate steps to take when their child showed early ARI symptoms, such as cough, cold, or fever. This led them to neglect or delay seeking healthcare. Poor actions could also result from limited access to health information, a lack of experience caring for children with ARI, and the belief that ARI is a mild illness that will heal on its own.<sup>23</sup> Mothers' lack of participation in previous health counseling or education activities also contributed to low practice levels. Health behaviors are not formed in isolation, but rather are the final result of previously developed knowledge and attitudes. Without sufficient knowledge of the importance of ARI management, prevention, and treatment, actions tend to be suboptimal.<sup>24</sup>

After the health promotion, most mothers' actions improved to the "fair" category. This was due to the health promotion raising the mothers' awareness of and ability to apply steps for the prevention and early treatment of Acute Respiratory Infections (ARI) in their children. The



education was delivered directly and interactively through lectures and discussions, providing a practical understanding that could be applied in daily life. The leaflet-based health promotion increased knowledge, changed mindsets, and improved attitudes toward the importance of preventive measures.<sup>25</sup> Mothers began implementing habits such as keeping their homes clean, ensuring good ventilation, keeping their children away from cigarette smoke, and seeking immediate healthcare if their child showed ARI symptoms. This increase in action demonstrates that targeted health promotion can encourage behavioral changes toward healthier practices. The success of health promotion is strongly influenced by educational approaches that are tailored to the characteristics of the target audience, such as their educational background, culture, and experience. When mothers actively engage in the educational process, they are more likely to internalize and apply the information to real-life situations.<sup>26</sup>

These findings are consistent with research showing that health promotion interventions significantly improve ARI prevention practices among mothers of toddlers. In that study, mothers' preventive actions were generally suboptimal before counseling. After the intervention, however, there was a significant shift: almost all respondents adopted practical measures, such as maintaining environmental cleanliness, improving ventilation, and promptly seeking healthcare if their children exhibited ARI symptoms.<sup>27</sup>

## CONCLUSION AND SUGGESTIONS

Based on the results of the study, it can be concluded that health promotion using leaflets significantly affects mothers' knowledge about acute respiratory infections (ARI) in children at the POLDA Sultra Clinic. Similarly, there is a significant effect on mothers' attitudes about ARI in children before and after health promotion using leaflet media at the POLDA Sultra Clinic. There was also a significant effect before and after the health promotion activities on the practices of the mothers regarding ARI in children at the POLDA Sultra Clinic.

Based on the results showing an increase in knowledge, attitudes, and practices among mothers after health promotion, it is recommended that the POLDA Sultra Clinic carry out health promotion activities routinely, particularly regarding ARI in children. These activities can be conducted through group or individual counseling or by distributing informative leaflets. Additionally, healthcare workers should use effective communication methods tailored to the mothers' backgrounds to make the messages easier to understand and apply.

## CONFLICT OF INTEREST

The author declares that there are no conflicts of interest regarding the research and writing of this article.



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