

CHAPTER I

INTRODUCTION

A. Background

Acute Respiratory Tract Infection (ARI) is a health problem for children under 5 years of age (toddlers) that remains a serious concern. ARI also ranks among the most common illnesses among children treated in primary healthcare facilities. Data from the 2023 Indonesian Health Survey (SKI) indicates that the prevalence of ARI in toddlers was 4.8%, increasing in 2024 to 5.2%. ARI accounts for nearly a third (29%) of toddler deaths, with approximately 2 million children losing their lives annually (Ministry of Health, 2024).

Data from the Bengkulu Provincial Health Office indicates that in 2023 there were 11,769 cases of ARI, with toddlers being the most affected. In 2024, this number increased to 12,431 cases, representing a 5.62% increase compared to the previous year (Bengkulu Provincial Health Office, 2024). The ARI data released by the Bengkulu City Health Office for the period January to September 2024 was 4,401 cases. In 2025, there was a significant increase in cases, reaching 5,142. This increase occurred primarily between July and September 2025 (Bengkulu City Health Office, 2025).

The main causes of ARI are generally viral and bacterial infections that attack the respiratory tract, such as Respiratory Syncytial Virus (RSV), influenza, parainfluenza, rhinovirus, adenovirus, and coronavirus, as well as several pathogenic bacteria such as *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Staphylococcus aureus*, *Bordetella pertussis*, and *Moraxella catarrhalis* (Correia et al., 2021; Pacheco et al., 2021). One of the most common forms of ARI that causes serious complications is pneumonia, particularly pneumonia caused by the bacteria *Streptococcus pneumoniae* and *Haemophilus influenzae* type b (Sun et al., 2021). The risk of ARI increases when toddlers are exposed to predisposing factors such as crowded living environments with minimal ventilation, poor air quality, low nutritional status, exposure to smoke, and an underdeveloped immune system. These conditions increase the chance of infection and worsen the severity of the disease (Indri et al., 2024).

One risk factor consistently associated with ARI in toddlers at home is exposure to cigarette smoke. Smoking in households has long been considered a tradition, a way of socializing, and even a ritual in certain cultures. A study conducted in Yogyakarta found a significant association between exposure to cigarette smoke and ARI in toddlers (Rahmawati et al., 2024). A similar study conducted in Jambi Province also reported that toddlers living with family members who smoke at home have a 2.34 times higher risk of developing acute respiratory infections (ARI) compared to those not exposed (CI: 1.458–3.741) (Ramadhani et al., 2025). Cigarette smoke can damage the cilia lining of the lungs, both respiratory tract cells and lung tissue, and weaken children's immune systems, making them more susceptible to viral, bacterial, and fungal infections that cause acute respiratory infections (ARI) (Feng et al., 2025).

The government has made various efforts to promote healthy lifestyles in the community, including reducing the risk of cigarette smoke exposure in toddlers through family education activities. Various studies indicate that the education provided remains conventional, such as brief, one-way, face-to-face counseling sessions without ongoing follow-up or behavioral reinforcement. Similarly, media such as leaflets or brochures tend to be one-way and disposable, making them less readable. These conditions limit the effectiveness of educational programs, particularly in shaping long-term behavioral change (Lailatul Barik et al., 2019). Therefore, more innovative, interactive educational media are needed, aligned with the developments in modern communication technology.

In line with the 2024 health transformation strategy launched by the Indonesian Ministry of Health in collaboration with the UNDP, digital transformation is a pillar in transforming health services (APJII, 2024). One digital medium with significant potential and widespread use is WhatsApp. According to a 2024 survey by the Indonesian Internet Service Providers Association (APJII), WhatsApp penetration in Indonesia reached over 90% of the internet user population. WhatsApp's ease of use, data-saving features, accessibility on various smartphones, and multimedia messaging capabilities

make it a highly effective tool for delivering health education, including reminders for healthy behaviors that can be sent periodically. This platform also enables two-way interaction between healthcare professionals and families, thereby increasing engagement and the effectiveness of health education programs.

Research by Skeen et al. (2023) in a randomized controlled trial showed that a digital parenting intervention through WhatsApp groups significantly improved responsive caregiving and the mental health of caregivers of children aged 9-32 months compared to a control group. Another study by Yusriani & Acob (2020) demonstrated that education via WhatsApp was more effective in changing adolescent smoking behavior than education via leaflets. A meta-analysis by Hou et al. (2025) demonstrated the effectiveness of WhatsApp interventions, increasing the likelihood of smoking cessation by up to 88% compared to conventional methods. This provides a strong basis for testing WhatsApp as an educational medium on the specific issue of smoke-free homes as an effort to prevent acute respiratory infections (ARI) in toddlers.

Theoretically, educational interventions via WhatsApp Reminders can be explained and strengthened using the Health Belief Model (HBM), which has been shown to be effective in predicting and changing health behaviors. This model emphasizes that individuals will change health behaviors when they feel vulnerable to a disease (perceived susceptibility), perceive the problem as serious and have a significant impact (perceived severity), believe that the behavior change brings clear benefits (perceived benefits), and see existing barriers as surmountable (perceived barriers). WhatsApp Reminders can serve as a highly effective cue to action, namely an external trigger that continuously and consistently reminds and encourages families to stop smoking indoors and implement smoke-free areas in the household (Kam & Lee, 2024). Furthermore, the Social Cognitive Theory model also supports the use of this digital technology, where learning can occur through observation, modeling, and reinforcement provided through periodically delivered multimedia content. This digital intervention is not only a medium for conveying information, but also an

instrument for behavior change connected to proven public health theories (Cheung et al., 2020). Research in Indonesia tends to focus on the effectiveness of conventional education, while evaluation of WhatsApp interventions to change family behavior in maintaining smoke-free homes remains very limited. This is despite its promising potential reach and effectiveness, which could be widely implemented with the support of existing technological infrastructure in Indonesia. This presents a novel research opportunity in this study.

Based on a preliminary survey conducted on August 15, 2025, at the Sawah Lebar Community Health Center (Puskesmas), an area with the highest number of ARI cases in Bengkulu City, the pediatric clinic register recorded 217 toddlers with ARI. Interviews with 10 mothers of toddlers with ARI revealed that 7 toddlers had family members who smoked. Based on this description, the researchers are interested in pursuing the research title: The Effectiveness of WhatsApp Smoke-Free Home Reminder Education on Mothers' Behavior in Preventing ARI in Toddlers in the Sawah Lebar Community Health Center's work area in Bengkulu City in 2026.

B. Research Problem

The lack of awareness and consistency of mothers in implementing ISPA prevention behaviors in toddlers, especially regarding the implementation of smoke-free homes, remains one of the factors contributing to the high incidence of ISPA in toddlers. Exposure to cigarette smoke in the home environment has the potential to increase the risk of respiratory tract disorders in toddlers, while prevention efforts carried out by mothers as primary caregivers are not yet fully optimal. This condition indicates the need for an effective and sustainable form of education to improve maternal behavior in preventing ISPA in toddlers. One alternative educational intervention that can be implemented is the use of WhatsApp Reminder as a health education medium. WhatsApp has the advantage of reaching targets quickly, is easily accessible, and allows for repeated and consistent delivery of educational messages, so it is expected to strengthen mothers' understanding and behavior in implementing smoke-free

homes as an effort to prevent ISPA in toddlers. Based on this background, the problem formulation in this study is: "Is WhatsApp Reminder of smoke free homes effective in improving maternal behavior in preventing ISPA in toddlers in the work area of the Sawah Lebar Health Center, Bengkulu City in 2026?"

C. Research Objective

1. General Objective

To determine the effectiveness of smoke free home whatsapp reminder on mothers behavior in preventing acute respiratory infections (ARI) among toddlers in the working area of Sawah Lebar Community Health Center, Bengkulu City In 2026

2. Specific Objectives

- a. To determine the characteristics of mothers (age, education, occupation, number of children, and history of ARI in toddlers).
- b. To determine the average maternal knowledge score before and after the intervention in the intervention and control groups.
- c. To determine the average maternal attitude score before and after the intervention in the intervention and control groups.
- d. To determine the average maternal action score before and after the intervention in the intervention and control groups.
- e. To determine the difference in the average maternal knowledge score before and after the intervention in the intervention and control groups and its effectiveness.
- f. To determine the difference in the average maternal attitude score before and after the intervention in the intervention and control groups and its effectiveness.
- g. To determine the difference in the average maternal action score before and after the intervention in the intervention and control groups and its effectiveness.

D. Significance of the Research

1. Theoretical Significance

The results of this study are expected to contribute to the development of nursing science, particularly in the field of community nursing and child health, by enriching scientific evidence regarding the effectiveness of digital technology-based education (WhatsApp Reminder) as a behavioral intervention in preventing ARI in toddlers.

2. Practical Significance

a. For Health Services/Community Health Centers

Provide an alternative, easy, affordable, and effective information technology-based educational intervention to support the prevention of ARI in toddlers through the implementation of smoke-free homes.

b. For Educational Institutions

To serve as a model for a WhatsApp-based intervention program that can be implemented routinely to raise family awareness of the dangers of cigarette smoke exposure and prevent ARI in toddlers.

c. For Other Researchers

To serve as a reference and basis for developing digital technology-based educational interventions in the fields of child health and public health.

d. For Families and Toddlers

To increase knowledge, foster more positive attitudes, and encourage mothers to implement smoke-free homes through WhatsApp Reminder education, thereby reducing the risk of ARI in toddlers.