

The Effectiveness of Local Micro-Video-Based Education (Health Microclips) in Preventing Acute Respiratory Infections Among Families with Toddlers in the Service Area of the Molompar Community Health Center, Southeast Minahasa Regency

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Abstract

Acute Respiratory Infection (ARI) is one of the leading causes of morbidity and mortality among children under five years of age in Indonesia. This study aimed to examine the effectiveness of local micro-video-based education (Health Microclips) in preventing ARI among families with toddlers in the service area of Molompar Community Health Center, Southeast Minahasa Regency. A pre-experimental design using a one-group pretest–posttest approach was employed. A total of 162 respondents were selected using purposive sampling. Data were collected using validated questionnaires measuring knowledge, attitudes, and preventive practices related to ARI prevention. The intervention was delivered through local micro-videos distributed via WhatsApp. Data were analyzed using the Wilcoxon Signed-Rank Test. The results showed that the proportion of respondents with good knowledge increased from 32.1% to 79.6%, positive attitudes increased from 56.2% to 88.9%, and good preventive practices increased from 63.6% to 85.2%. The Wilcoxon test results showed a p-value of 0.000 ($p < 0.05$) for all variables. It was concluded that local micro-video-based education (Health Microclips) was effective in improving knowledge, attitudes, and preventive practices related to ARI prevention among families with toddlers.

INTRODUCTION

Acute Respiratory Infection (ARI) is one of the most common infectious diseases among children worldwide and remains a major cause of high morbidity and mortality among toddlers. In Indonesia, ARI consistently ranks among the top ten most prevalent diseases affecting the population (Aidi et al., 2025; Fitrah et al., 2025; Lutpiatina et al., 2022; Muharram et al., 2024; Purnama et al., 2025; Wulandari et al., 2024; Zainuddin et al., 2025). This condition is further aggravated by the immature immune systems of toddlers, making this age group highly vulnerable to infections transmitted through respiratory droplets during coughing or sneezing, direct contact with infected individuals, and exposure to poor environmental hygiene conditions (Falah, 2025).

Based on data from the Indonesian Health Survey (2023), the prevalence of ARI across all age groups in Indonesia reached 23.5%, affecting approximately 877,531 individuals, while

the prevalence among toddlers reached 34.2%, affecting approximately 86,364 children. Data from the Ministry of Health's Data and Information Center recorded 14,377 ARI cases among toddlers in 2021 and 12,503 cases in 2022, indicating that the incidence of ARI remained relatively high despite a declining trend (Jumriani et al., 2024). At the local level, data from Molompar Community Health Center indicated that approximately 628 toddlers aged 0–5 years were within its service area, with around 30% or 190 toddlers experiencing ARI cases in 2025. Therefore, ARI remains a priority health issue requiring serious attention.

ARI prevention among toddlers highly depends on the active role of families, particularly mothers as primary caregivers (Ahmad & Nugrawati, 2024; Chand & Mohammadnezhad, 2022; Lutpiatina et al., 2022; Putri et al., 2022; Yulianita et al., 2023). Improving knowledge, developing positive attitudes, and implementing preventive practices, such as handwashing, cough etiquette, maintaining household cleanliness, ensuring adequate ventilation, and avoiding exposure to cigarette smoke, are essential measures that should be applied within the family environment (Notoatmodjo, 2014). Therefore, effective, attractive, and accessible health education strategies are essential to reduce the incidence of ARI among toddlers.

To date, health promotion activities in primary healthcare facilities, such as community health centers, have generally relied on conventional methods, including oral counseling and leaflet distribution. These approaches are often less effective because they may not optimally attract public attention, provide limited opportunities to assess audience comprehension, and do not facilitate repeated access to educational materials independently. Advances in information and communication technology, along with the widespread use of smartphones among communities, including rural populations, provide significant opportunities for utilizing audiovisual media as a more innovative and effective health education tool (Sayuti, 2022).

Micro-videos or short-form videos have demonstrated effectiveness as health education media across various contexts. This medium can deliver information in a concise, engaging, and easily understandable format for diverse audiences. Compared with printed media, micro-videos have the advantage of combining visual, audio, and narrative elements simultaneously, allowing information to be processed through multiple cognitive channels in accordance with multimedia learning principles (Mayer, 2001). Furthermore, micro-videos can be accessed anytime and anywhere, enabling repeated exposure and reinforcement of health messages (Pardana & Hidayati, 2024).

Previous studies, including Sa'ban et al. (2024) on the influence of ARI poster-based educational media on elementary school students' knowledge and Mulyani et al. (2022) on the effect of educational videos on mothers' knowledge regarding toddler health, remain limited to conventional media or general educational videos without a locality-based approach. These studies have also not specifically examined the effectiveness of such interventions among families with toddlers in rural areas of North Sulawesi. Similarly, Situmeang et al. (2023) examined educational videos based on local wisdom but focused primarily on knowledge and attitudes without comprehensively measuring changes in preventive practices. This study addressed these gaps by developing and evaluating Health Microclips, a local content-based micro-video intervention adapted to the language, culture, and environmental conditions of communities in Southeast Minahasa Regency.

This study specifically developed and evaluated Health Microclips, which are local content-based micro-videos adapted to the language, culture, and environmental conditions of

communities in Southeast Minahasa Regency. This content localization approach is expected to improve the relevance and acceptance of health messages because communities can more easily relate to situations presented in the videos (Situmeang et al., 2023). Based on this background, this study aimed to analyze the effectiveness of local micro-video-based education (Health Microclips) in improving knowledge, attitudes, and preventive practices related to ARI among families with toddlers in the service area of Molompar Community Health Center, Southeast Minahasa Regency. This research is expected to contribute theoretically by enriching studies on health promotion and public health education, particularly regarding the use of locally based digital media for infectious disease prevention. Practically, the findings are expected to provide input for community health centers and health workers in developing innovative, effective, and locally appropriate health promotion strategies. Furthermore, the results may serve as a reference for developing digital technology-based health policies in primary healthcare facilities in Eastern Indonesia.

METHOD

Design, Timing, and Research Location

This study employed a pre-experimental design with a one-group pretest–posttest approach without a control group. This design was selected to assess changes in respondents' knowledge, attitudes, and preventive practices before and after receiving a Health Microclips-based educational intervention. The research was conducted in the service area of UPTD Molompar Community Health Center, East Tombatu District, Southeast Minahasa Regency, from April to May 2026. The research location was selected due to the high incidence of ARI among toddlers and the limited utilization of locally based digital educational media in health promotion activities in the area.

Population and Sample

The study population is all housewives who have toddlers aged 0-5 years and domicile in the work area of the Molompar Health Center, totaling 271 people based on data from the health center. The determination of the sample size using the Slovin formula with an error rate of 5%, resulted in a sample number of 162 respondents. The sampling technique used is purposive sampling, which is sampling based on certain criteria set by the researcher.

Inclusion criteria include: (1) mothers who have toddlers aged 0–5 years; (2) domiciled in the working area of the Molompar Health Center and present at Posyandu activities during the research; (3) able to communicate well and understand research instruments; (4) have a mobile phone with the active WhatsApp application to receive and watch educational videos; and (5) willing to sign an informed consent sheet. The exclusion criteria include respondents who did not complete the entire series of research, could not access educational videos, or resigned during the study.

Data Collection Instruments and Procedures

Primary data were collected using a structured questionnaire compiled by the researcher and have gone through validity and reliability tests. The questionnaire consists of three parts: (1) a knowledge questionnaire about the definition, risk factors, signs and symptoms, and ways to prevent ISPA; (2) an attitude questionnaire on efforts to prevent ISPA; and (3) questionnaire

on ISPA preventive measures carried out daily. Questionnaires were given before the intervention (pre-test) and after the intervention (post-test).

Intervention is carried out through the provision of education using Health Microclips media which contains comprehensive information about ISPA including the definition of disease, risk factors, signs and symptoms, and concrete preventive measures. After the pre-test was carried out at the Posyandu activity, the researcher asked for the respondent's WhatsApp number and sent an educational video through the application. The post-test was carried out through a home visit after the respondents received and watched all the video materials submitted. Secondary data was obtained from health center records, village health profiles, and health office reports.

Data Analysis

The data is analyzed using statistical software. Univariate analysis was conducted to describe the characteristics of respondents and the frequency distribution of the study variables. The data normality test using Kolmogorov-Smirnov yielded a significance value of 0.000 ($p < 0.05$) for all variables, indicating that the data were not normally distributed. Thus, bivariate analysis to compare pre-test and post-test data using the non-parametric Wilcoxon Signed Rank Test with a significance level of $\alpha = 0.05$. The hypothesis is accepted if the p -value < 0.05 , which indicates that there is a significant difference between before and after the intervention.

RESULTS AND DISCUSSION

Overview of Research Locations

The Molompar Health Center is a first-level health service facility located in East Tombatu District, Southeast Minahasa Regency. The work area of the health center covers 11 villages with an area of about 35.5 km², including Molompar Village, Molompar Satu, Molompar Atas, Molompar Dua, Molompar Dua Utara, Molompar Dua Selatan, Mundung, Mundung One, Esandom, Esandom One, and Esandom Dua. The Puskesmas organizes various promotive, preventive, curative, and rehabilitative health service programs, with the vision of realizing a healthy and independent community in its work area. Most of the area is lowland accessible by land transportation, with the typical socio-cultural characteristics of the people of Southeast Minahasa.

Respondent Characteristics

Table 1. General Characteristics of Respondents (n=162)

Features	N	%
Mother's Age Group		
20–29 years old	106	65,4
30–39 Years	54	33,3
>40 Years	2	1,2
Final Education		
SMP	25	15,4
SMA	123	75,9
Bachelor	14	8,6
Jobs		
Housewives (IRT)	140	86,4
Private	17	10,5
Pharmacist	3	1,9

Features	N	%
PNS	2	1,2
Toddler Age		
1 Year	45	27,8
2 Years	38	23,5
3 Years	38	23,5
4 Years	38	23,5
5 Years	3	1,9
Gender of Toddlers		
Male	65	40,1
Female	97	59,9
Total	162	100

Source: Primary Data, 2026

Based on Table 1, the majority of respondents are in the age group of 20–29 years (65.4%), indicating that most mothers with toddlers are at a productive age who tend to be more open to the adoption of digital-based health information and technology. The level of education is dominated by high school graduates (75.9%), which indicates that respondents have adequate basic skills to receive, understand, and process health information conveyed through micro-video media.

In terms of employment, most of the respondents were housewives (86.4%), reflecting the central role of mothers in the care of toddlers and the implementation of disease prevention behaviors in the family environment. This condition is an advantage because housewives have more time and opportunity to watch educational videos sent through WhatsApp and apply the information obtained in their daily lives.

The distribution of the age of toddlers shows that the largest proportion is 1-year-old toddlers (27.8%), while toddlers aged 2–4 years are 23.5% each. This age group is the most vulnerable group to ISPA because the immune system is still developing, so educational interventions to families are very crucial. The gender of toddlers is dominated by women (59.9%), although clinically gender is not the main risk factor for ISPA and both require equal attention in prevention efforts.

Distribution of Knowledge, Attitudes, and Actions Before and After Intervention

Table 2. Frequency Distribution of Pre-test and Post-test Knowledge, Attitudes, and Actions (n=162)

Variabel	Category	Pre-test n (%)	Post-test n (%)
Knowledge	Good	52 (32,1%)	129 (79,6%)
	Enough	60 (37,0%)	26 (16,0%)
	Less	50 (30,9%)	7 (4,3%)
Attitude	Positive	91 (56,2%)	144 (88,9%)
	Negatives	71 (43,8%)	18 (11,1%)
Actions	Good	103 (63,6%)	138 (85,2%)
	Less	59 (36,4%)	24 (14,8%)
Total Respond		162 (100%)	162 (100%)

Source: Primary Data, 2026

Table 2 shows substantial changes in all three study variables after the administration of Health Microclips. In terms of knowledge, there was a very significant shift in the category,

where the knowledge of the good category increased from 32.1% to 79.6%, while the less category dropped drastically from 30.9% to only 4.3%. This condition illustrates that before the intervention, almost a third of respondents still had a low understanding of ISPA. After being given Health Microclips, almost four out of five respondents managed to reach the category of good knowledge.

In terms of attitudes, changes are also noticeable. Before the intervention, there were still 43.8% of respondents with a negative attitude, indicating a lack of awareness and belief in the importance of preventing ISPA. After the intervention, the proportion of positive attitudes increased to 88.9% and negative attitudes decreased to only 11.1%. This shows that Health Microclips not only successfully transfer cognitive information, but are also able to influence the affective dimension of respondents in forming perceptions that are more supportive of preventive behaviors.

In the action aspect, the proportion of respondents with good actions increased from 63.6% to 85.2% after the intervention. Although before the intervention, more than half of the respondents had good actions, there were still 36.4% who were not consistent in implementing preventive behavior. The post-intervention improvement reflects that the information obtained through Health Microclips is able to encourage respondents to be more active in implementing ISPA prevention measures, such as maintaining the cleanliness of the home environment, paying attention to air ventilation, getting used to hand washing, and avoiding exposure to cigarette smoke around toddlers.

Average Knowledge, Attitude, and Action Score

Table 3. Average Pre-test and Post-test Scores of Knowledge, Attitude, and Action (n=162)

Variable	N	Mean Pre-test	Mean Post-test	Mean Difference	SD Pre	SD Post
Knowledge	162	1,99	1,25	0,74	0,796	0,524
Attitude	162	1,44	1,11	0,33	0,498	0,315
Actions	162	1,36	1,15	0,21	0,483	0,356

Source: Primary Data, 2026

Table 3 shows the change in the average score value of the three variables. It should be noted that in the scoring system used, a lower mean represents a better category (score 1 = good, score 2 = fair/positive/good, score 3 = less/negative/less). Thus, the decrease in the mean value on all variables indicates an improvement in the quality of respondents' knowledge, attitudes, and actions.

Knowledge underwent the largest change with a mean difference of 0.74 (from 1.99 to 1.25). A decrease in the standard deviation from 0.796 to 0.524 indicates that the level of knowledge between respondents became more homogeneous after the intervention, indicating that Health Microclips was able to improve understanding evenly across all groups of respondents. Attitudes changed with a mean difference of 0.33 (from 1.44 to 1.11), and actions of 0.21 (from 1.36 to 1.15). This large sequence of changes—knowledge > attitudes > actions—is consistent with the theory of behavior change which states that cognitive changes generally precede affective changes, which then drive conative or behavioral changes (Notoatmodjo, 2012).

Wilcoxon Signed Rank Test Results

Table 4. Wilcoxon Signed Rank Test Results of Knowledge, Attitude, and Action (n=162)

Variabel	Negative Ranks (n)	Positive Ranks (n)	Ties (n)	Z	p-value
Knowledge	87	2	73	-8,262	0,000
Attitude	53	0	109	-7,280	0,000
Actions	35	0	127	-5,916	0,000

Remarks: Negative Ranks = post-test scores higher than pre-tests; Positive Ranks = a post-test score lower than a pre-test; Ties = unchanged value. Significance level $\alpha = 0.05$.

Source: Primary Data, 2026

Table 4 shows the results of the Wilcoxon Signed Rank Test on the three research variables. In the knowledge variable, there were 87 negative ranks (higher post-test), 2 positive ranks (lower post-test), and 73 ties (unchanged), with values of $Z = -8.262$ and $p = 0.000$. In the attitude variable, there were 53 negative ranks, 0 positive ranks, and 109 ties, with $Z = -7.280$ and $p = 0.000$. In the action variable, there were 35 negative ranks, 0 positive ranks, and 127 ties, with $Z = -5.916$ and $p = 0.000$.

All $p < 0.05$ values prove that there is a statistically significant difference between the conditions before and after the administration of Health Microclips on the three variables. The largest Z-value on the knowledge variable ($Z = -8.262$) indicated that the strongest influence of the intervention occurred on the cognitive dimension, followed by the affective dimension (attitude, $Z = -7.280$), and the conative dimension (action, $Z = -5.916$). The absence of positive ranks on the attitude and action variables showed that none of the respondents experienced a decrease in attitude or action after the intervention, so that Health Microclips was proven not to have a negative impact on the respondents' ISPA prevention behavior.

The effectiveness of Health Microclips in improving respondents' knowledge is supported by the characteristics of the media that combine visual, audio, and narrative elements in local languages. According to Mayer's (2001) multimedia learning theory, individuals learn more effectively when information is conveyed through two simultaneous channels—visual (images, animations) and auditory (sound, narrative)—than through just one channel. These findings are in line with the research of Sa'ban et al. (2024) which showed a significant increase in ISPA knowledge after media-based education, and the research of Mulyani et al. (2022) which proved that educational videos are able to increase the knowledge of mothers under five about health care more effectively than conventional methods.

The aspect of content localization is the main advantage of Health Microclips in this study. The use of familiar regional languages, examples of situations from the daily lives of the people of Southeast Minahasa, and the presentation in accordance with the local socio-cultural reality made it easier for respondents to identify themselves with the material presented. This is in line with the findings of Situmeang et al. (2023) who concluded that videos based on local wisdom have a significant influence on mothers' knowledge and attitudes in recognizing the danger signs of ARI, because local language makes the material easier to understand and health messages are more effectively accepted by the community.

Significant changes in attitudes reflect the ability of Health Microclips to influence the affective dimension of respondents, not just their cognitive dimensions. According to Azwar (2010), attitudes are formed through cognitive, affective, and conative components that are interrelated. When understanding (cognitive) increases, beliefs and feelings (affective) about the importance of preventing ISPA are also formed. These findings are consistent with the research of Faizah and Anggraeni (2023) which shows an increase in parents' positive attitudes towards the prevention of ISPA after education using e-booklet media, as well as research by Kertamana et al. (2025) which prove that video media is more effective in forming positive attitudes of mothers than lecture methods.

The increase in preventive measures, although relatively small compared to knowledge and attitudes, suggests that Health Microclips are successful in driving real behavioral changes in respondents' daily lives. The phenomenon that change in actions is slower than knowledge and attitudes can be explained through the concept of behavior change put forward by Notoatmodjo (2014), where actions or practices are the most complex manifestations of health behaviors that require a longer process of adaptation, habituation, and environmental support. Pakpahan et al. (2021) also explained that health measures are influenced by the perceived benefits and barriers felt by individuals; The higher a person's belief in the benefits of preventive measures, the more consistent the preventive behavior applied.

The ease of access to Health Microclips via WhatsApp is an important supporting factor in the effectiveness of this intervention. Respondents can rewatch the video anytime and anywhere, allowing for the repetition of health messages that act as reinforcement to accelerate the process of internalizing information and adopting new behaviors (Pardana & Hidayati, 2024). Distribution through WhatsApp has also proven to be practical considering that the majority of respondents are housewives of productive age who are familiar with the use of the instant messaging application in daily life.

Overall, the findings of this study provide empirical evidence that Health Microclips is an effective and adaptive technology-based health promotion strategy for the context of rural communities in Southeast Minahasa. This approach is considered more in line with technological developments and the needs of modern society which tends to be more responsive to short, interesting, and easy-to-understand visual information. Molompar Health Center and similar health facilities in other areas can adopt this approach as part of routine health promotion programs, especially in efforts to prevent ISPA in children under five.

CONCLUSION

Based on the results of this study, it was concluded that local micro-video-based education (Health Microclips) was effective in improving knowledge, attitudes, and preventive practices related to Acute Respiratory Infection (ARI) among families with toddlers in the service area of Molompar Community Health Center, Southeast Minahasa Regency. The proportion of respondents with good knowledge increased from 32.1% to 79.6%, positive attitudes increased from 56.2% to 88.9%, and good preventive practices increased from 63.6% to 85.2% after the intervention. The Wilcoxon Signed-Rank Test showed a p-value of 0.000 ($p < 0.05$) for all three variables, indicating statistically significant differences between the conditions before and after the implementation of Health Microclips.

The findings of this study suggest that Molompar Community Health Center should integrate Health Microclips as a routine educational medium in health promotion programs, particularly for ARI prevention among toddlers. Distribution through WhatsApp was found to be an effective and efficient channel for delivering health information to the community. Future research is recommended to apply a randomized controlled trial design with a control group to provide stronger evidence of causal relationships and to conduct long-term evaluations to assess the sustainability of behavioral changes after the intervention period.

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