
**EFFICACY OF HEALTH EDUCATION ON ENHANCING IMMUNITY TO
REDUCE INFECTION INCIDENCE IN INFANT AND TODDLER
POPULATIONS**

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ABSTRACT

Infections in infants and toddlers are significant health issues in developing countries, including Indonesia, particularly in rural areas with limited access to healthcare services. This study aims to evaluate the effectiveness of a health education program on immunity in reducing the incidence of infections among infants and toddlers in Sumber Kokap Village, Bondowoso Regency. The research design used is a quasi-experimental approach with a pretest-posttest design involving 56 mothers as respondents. The study results show a significant increase in maternal knowledge about immunity after participating in the health education program, with the average knowledge score rising from 62.3 before the intervention to 78.9 after the intervention. Statistical tests indicate a statistically significant difference (p -value < 0.001) between pre- and post-intervention knowledge, suggesting that the health education provided was effective in enhancing maternal knowledge and awareness regarding the importance of immunity and infection prevention in infants and toddlers. These findings underscore the importance of health education programs in improving child health in rural areas and provide a scientific basis for broader health policy development in Indonesia.

Keywords : *Infant And Toddler Infections; Health Education, Immunity*

INTRODUCTION

Health issues among infants and toddlers remain a primary challenge in developing countries, including Indonesia. This population has an immature immune system, making them more susceptible to infections, especially in environments with limited healthcare access (Dietert, 2008). Infectious diseases and malnutrition are also major causes of infant mortality in developing nations. Researchers have reported that children receiving early skin-to-skin contact practices have a lower risk of

acute respiratory and gastrointestinal infections than those who do not (Ena Sari et al., 2023). According to Indonesia's Health Profile in 2023, neonatal mortality is driven by conditions such as respiratory and cardiovascular issues (1%), low birth weight (LBW) (0.7%), congenital abnormalities (0.3%), infections (0.3%), nervous system diseases (0.2%), intrapartum complications (0.2%), and other undetermined causes (14.5%), with additional causes accounting for 82.8%. During the post-neonatal period, pneumonia has become a significant cause of

mortality, contributing to about 2% of deaths. Key health issues affecting newborns, including LBW, infections, and congenital anomalies, account for a large portion of infant mortality (Kemenkes RI, 2023). In rural areas of Indonesia, limited access to healthcare exacerbates these challenges. In Sumber Kokap Village, Bondowoso Regency, the incidence of infections in infants and toddlers remains high, particularly respiratory and diarrheal infections, with data from the local health center indicating that over 30% of infants and toddlers experience infections annually (Bodewes et al., 2019).

Addressing this issue is critical, as recurrent infections in infants and toddlers can lead to long-term health complications, including malnutrition, developmental delays, and an increased risk of chronic diseases later in life. One potential solution is health education for parents, emphasizing the importance of immunity and infection prevention for children. If toddlers contract infections, it disrupts their growth and development; recurrent infections divert energy from food intake toward fighting infections, impeding growth and potentially leading to stunting (Susyani, et al, 2023). A history of infections significantly affects a toddler's nutritional status, as illness weakens immunity and reduces the efficiency of nutrient absorption (Ramadanti & Apriza Yanti, 2023). Health education programs focused on immunity have proven effective in raising parental awareness and knowledge, enabling them to adopt better health practices to protect their children. Christa L Fischer Walker et al., (2013) highlighted that effective child health education enhances parental adherence to immunization schedules, where the primary benefit of immunization lies in strengthening immunity and reducing morbidity and mortality from

infectious diseases. It also promotes environmental hygiene and good nutrition, all of which contribute to strengthening children's immune systems (Ridwan, 2013).

This study aims to evaluate the efficacy of a health education program on immunity in reducing infection rates among infants and toddlers in Sumber Kokap Village. The program will assess changes in parental knowledge and health behaviors regarding infection prevention before and after the education sessions. This educational approach is expected to help reduce infection rates within this vulnerable age group, provide empirical data on the effectiveness of health education in rural areas, and encourage the development of similar programs in other regions facing similar health challenges (Barroso et al., 2020).

RESEARCH METHODS

This research utilizes a quantitative approach with a quasi-experimental design to evaluate the impact of immunity-focused health education on parental knowledge and infection incidence among infants and toddlers. The study involved 56 parents of children aged 0-5 years residing in Sumber Kokap Village, Bondowoso Regency. Pre-test and post-test questionnaires served as the primary instruments to assess shifts in parental knowledge following the educational intervention, while data on infection incidence were sourced from medical records and interviews. Key variables include parental knowledge of immunity, measured via questionnaire scores, and the frequency of infection cases. Data were analyzed using SPSS version 26, applying paired t-tests to determine significant differences in knowledge scores before and after the intervention, alongside



descriptive analysis for infection frequency. This study has received ethical approval issued by the Faculty of Health, Nurul Jadid University, with the reference number NJ-T06/056/KEPK/F.Kes/06.2024 (Creswell, 2003;Syofian Siregar, 2017)

RESULTS AND DISCUSSION

The study was conducted in July 2024 in Sumber Kokap Village, Bondowoso Regency, with 56 respondents. The following results were obtained:

Table 1 Respondent Age Distribution

Age Group	Frequency	%
≤ 20 years	3	5.4%
21-30 years	22	39.3%
31-40 years	25	44.7%
< 40 years	6	10.6%

Based on table 1 illustrates the demographic characteristics of the 56 respondents participating in this study, with the majority falling within the 31-40 age range (44.7%).

Table 2 Educational Level of Respondents

Education Level	Frequency	%
Elementary/ Equivalent	9	16.1%
Junior High/Equivalent	19	33.9%
High School/Equivalent	21	37.5%
Higher Education	7	12.5%

Based on table 2 indicates that the majority of respondents possess a high school level of education (37.5%).

Table 3 Respondent Occupation

Occupation	Frequency	%
Housewife	50	89.2%
Teacher	4	7.1%
Entrepreneur	1	1.7%

Based on table 3 indicates that the majority of respondents are housewives (89.2%).

The majority of respondents are grouped within the category productive age group (31-40 years), possess a high school education level, and primarily serve as housewives. This is consistent with previous studies indicating that housewives are frequently the main targets of health education programs, as they generally have more time and responsibility in child care (Mirah et al., 2019). Education level is also a pertinent factor; Ena Sari et(2023) observes that mothers with secondary education tend to have greater knowledge of basic health practices compared to those with lower education levels, though ongoing education is necessary to deepen their understanding. This demographic is particularly relevant, as both educational background and daily roles significantly influence an individual's capacity to assimilate health information (Michael Marmot & Richard G. Wilkinson, 2005).

Knowledge of Respondents Before and After the Intervention

Table 4 Distribution of Respondents' Knowledge Before and After the Intervention

Knowledge Category	Before	After
	Intervention (n=56)	Intervention (n=56)
Low	20 (35.7%)	0 (0%)
Moderate	30 (53.6%)	22 (39.3%)
High	6 (10.7%)	34 (60.7%)

Based on table 4 indicate a substantial increase in baseline knowledge, progressing from low and moderate levels prior to the intervention to high levels afterward, suggesting that the educational strategies applied were effective in enhancing health



awareness and understanding. Initially, 35.7% of respondents were categorized as having low knowledge; however, post-intervention, all respondents had improved to at least a moderate level (39.3%), with 60.7% reaching a high level. This finding emphasizes the effectiveness of community-based health education in advancing awareness and understanding of infection prevention in infants and toddlers (Kemenkes RI, 2023). Knowledge acquisition mainly occurs through auditory and visual senses (Nengsih & Sartika, 2024), and this improvement signifies that the educational content effectively filled knowledge gaps and reinforced understanding of the critical role of immunity in infection prevention (Qurrotul et al., 2023).

Average Knowledge Score of Respondents Before and After the Intervention

Table 5 Average Knowledge Score of Respondents Before and After the Intervention

Knowledge Score	Before Intervention	After Intervention
Mean	62.3	78.9
Standard Deviation	8.7	6.5

Based on table 5 the findings demonstrate an increase in the average score from 62.3 to 78.9, accompanied by a reduction in standard deviation from 8.7 to 6.5, indicating that the intervention also improved the consistency of understanding among respondents. This consistency is essential as it implies that the information was effectively comprehended across the entire respondent population, thereby reducing knowledge disparity. These results support the perspective that group-based health education programs are effective in fostering healthy behaviors and promoting

uniform understanding within communities (Firdaus et al., 2024). In the context of public health, enhancing knowledge through health education is vital in lowering infection rates, particularly among vulnerable groups such as infants and toddlers (World Health Organization (WHO), 2021).

Paired t-test Results

Table 6 Paired t-test Results for Respondents' Knowledge

Variable	t-value	p-value
Pre-test and Post-test Knowledge	9.78	<0.001

Based on table 6 shows a t-value of 9.78 with a p-value of <0.001, indicating a statistically significant difference in knowledge between the pre-test and post-test. This statistical significance provides strong evidence that health education effectively enhanced respondents' knowledge of immunity and infection prevention in children. This finding aligns with existing literature, which shows that health education interventions can significantly influence mothers' knowledge and health behaviors, particularly in the contexts of child care and disease prevention (Wahyu R. W.& Yuni S., 2020)

From a public health perspective, these results underscore the critical role of ongoing health education, particularly through community-based programs such as *posyandu*, in increasing mothers' knowledge and awareness of the importance of child immunity. By gaining a better understanding of immunity and preventive measures, mothers are more likely to adopt improved health practices, ultimately contributing to reduced infection rates among infants and toddlers (WHO), 2021b; Kemenkes RI, 2023).



CONCLUSION

The findings of this study suggest that the health education program on immunity provided to mothers in Sumber Kokap Village, Bondowoso Regency, was effective in improving their knowledge on infection prevention for infants and toddlers. Intervention outcomes showed a significant increase in knowledge scores, from an average of 62.3 to 78.9, with all respondents advancing in knowledge categories. This demonstrates that community-based health education, such as through *posyandu*, effectively addresses knowledge gaps and enhances awareness of the importance of immunity in infection prevention. Additionally, statistical tests indicated a significant difference in knowledge levels before and after the educational intervention (t-value = 9.78, p-value < 0.001). This finding underscores the vital role of health education in reducing the risk of infections in children by promoting preventive behaviors at the family level. Consequently, health education emerges as an effective and applicable strategy for reducing infection rates among infants and toddlers in other rural areas.

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