

## The Effect of E-leaflet Education on Red Onion Administration to Improve Mothers' Knowledge About Reducing Fever After DPT Immunization

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### ABSTRACT

**Introduction:** Fever is a normal response of the body to infection or a form of resistance in the body in adjusting antibodies due to immunization. Fever can be a sign of the onset of infection, but fever can also be caused by metabolic disorders and other causes. Red onion (*Allium cepa* varietas *ascalonicum*) can be used as a fever reducer for infants and toddlers with fever. The content of organic sulfur compounds, or Allylcysteine Sulfoxide (Alliin). Many parents are still unaware of the benefits of red onions for reducing fever in children. Therefore, the researchers aimed to determine the effect of providing e-leaflet education on the administration of red onions on increasing mothers' knowledge about reducing fever after DPT immunization.

**Methods:** The method used was a pre-experiment, one group pre-test post-test. The sample size was 30 respondents. The results of the study showed that the respondents' knowledge before receiving education through the e-leaflet on the use of shallots was still lacking at 63.4%.

**Results:** Respondents' knowledge after receiving e-leaflet education on the use of shallots was 90%. There was an effect of e-leaflet education on the use of shallots on increasing mothers' knowledge about reducing fever after DPT immunization, with a Sig value of 0.000.)

**Conclusions:** There is an effect of e-leaflet education on giving red onions to increase mothers' knowledge about reducing fever after DPT immunization.

## Introduction

KIPI (Post-Immunization Adverse Events) are conditions that occur as a result of immunization side effects (Sekar et al., 2023). KIPI is characterized by fever, swelling, and redness at the injection site. KIPI caused by the DPT-Hib vaccine has an impact on mothers who bring their children to participate in the immunization program. Mothers' knowledge is very important in order to manage and handle KIPI DPT-Hib in children (Anggraini & Maratning, 2022). Fever, which often occurs as a result of KIPI effects, is a common disorder in infants and toddlers. Fever is defined as a rise in body temperature of approximately 0.8°C to 1.1°C, which is above 38°C (above normal body temperature). Fever is a normal response of the body to infection or a form of the body's resistance in adjusting antibodies due to immunization. Fever in infants can be caused by viral infections, excessive heat exposure (overheating), fluid deficiency (dehydration), allergies, KIPI events due to immunization, and immune system disorders. Fever is generally not dangerous, but it can be dangerous for infants if the fever is high. The urgency of this study stems from parents' lack of knowledge about fever management, which is likely due to a lack of socialization or information about fever management after DPT immunization. They are reluctant to ask questions and do not take the initiative to find out more. Therefore, one of the problems is the lack of knowledge about fever management in toddlers after DPT immunization with complementary therapy.



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Fever can have negative effects that can be dangerous for infants, such as dehydration, oxygen deprivation, neurological damage, and febrile convulsions (Pebriani et al., 2023). According to the SDKI (Indonesian Demographic Health Survey) report (2017), 31% of infants under 5 years of age or toddlers are known to experience fever, and 37% of infants aged 6-23 months are more susceptible to fever, with 74% being taken to health care facilities (Kemenkes, 2020). According to Basic Health Research data in Indonesia, 33.4% of infants experienced adverse events following immunization (AEFI) out of 91.3% of infants who received immunization, with symptoms including redness in 20.6% of cases and swelling in 20.2% of cases. 6.8% had high fever and 6% had pus. Based on data from the Pontang Community Health Center, 30% of children under the age of 5 had KIPI, with the highest number of cases in Pesisir Village at 18%. Several methods such as herbal medicine have been used since ancient times by Indonesian society. Women are more likely to use complementary and alternative medicine because it has fewer side effects than chemical drugs. Currently, midwives around the world are more likely to use complementary therapies in their profession than other medical practitioners. Midwives typically use one or two complementary therapies, such as herbal medicine, massage, exercise, nutritional supplements, and others. In Indonesia, there is currently no specific law regulating the implementation of complementary midwifery services, but the general implementation is regulated in the Minister of Health Decree No. 1109/Menkes/per/IX/2007 concerning complementary-alternative medicine. For midwives and women, complementary midwifery services are an option to reduce medical intervention (Dewi Andariya Ningsih, 2015).

Fever can be a sign of infection, but it can also be caused by metabolic disorders and other causes. Fever in children is an open-ended problem, with many unexpected possibilities, so it is necessary to find out the cause of the fever. Fever is generally not dangerous, but high fever can be harmful to children. The negative effects of fever that can be dangerous for children include dehydration, oxygen deprivation, neurological damage, and febrile convulsions. Fever must be treated properly to minimize negative effects. According to health articles, fever in infants can cause several complications, such as severe dehydration, hallucinations, brain damage, and febrile convulsions in children aged 6 months to 5 years. This is one of the aspects of midwifery care in helping to ensure the well-being of toddlers (Ningsih, 2017)

Red onion (*Allium cepa* varietas *ascalonicum*) can be used as a fever reducer for infants and toddlers with fever. The organic sulfur compound, or Allylcysteine Sulfoxide (Alliin), can reduce fever by breaking down blood clots, allowing blood circulation to stabilize and heat from the body to be distributed to the peripheral blood vessels. Other compounds in red onions that can lower body temperature include essential oils, phlorogusin, cycloalliin, methylalliin, kaempferol, and quercetin. The essential oils act as an external remedy by dilating capillaries and stimulating perspiration. Rubbing red onions all over the body causes strong vasodilation of the skin, which accelerates the transfer of heat from the body to the skin. This is supported by research conducted by (Betty, 2019), which states that shallots are indeed effective in reducing fever (Pebriani et al., 2023). Health services today commonly use complementary therapies. Complementary therapy is a treatment aimed at improving public health. In Indonesia, there are regulations governing this service, namely the Minister of Health's regulation on the implementation of traditional complementary health services. Complementary therapy consists of promotive, preventive, curative, and rehabilitative efforts that have been tested for safety and effectiveness based on research and scientific findings. Complementary therapy addresses various diseases or complaints using traditional techniques and does not involve surgery, drugs, or pharmaceutical products, but rather utilizes various types of therapy and herbs (RI. Kemenkes, 2018). Complementary therapy is currently a major topic in various countries. Complementary therapy is an important part of healthcare services. For example, in the United States and other countries,



386 million people visit conventional practices, and around 42% use complementary therapy, with an increase every year (Altika & Kasanah, 2021).

Wijayanti in (Maros, 2021) explains that a leaflet is a paper-like flyer, and most leaflets are smaller in size than pamphlets. Based on developments over time, there has been research on the development of e-leaflets. E-leaflets can help readers learn more easily and present material in a more attractive way, so that readers are enthusiastic about understanding the content and can open it at any time. This is supported by research conducted by (Hermalasari et al., 2023) that learning with the help of Android-based teaching materials can be an alternative in improving students' academic performance. The use of e-leaflets is not much different from when we access web pages normally and can be easily shared with friends or relatives in web form through WhatsApp, Instagram, or Facebook applications. (Safitri, 2024) also explains the advantages of e-leaflets, namely that they have become a successful, cost-effective, and environmentally friendly method of sharing information. E-leaflets also have a systematic and concise structure for presenting material so that students do not feel that the learning or material is too heavy, making them feel burdened by the material presented. The learning process seems relaxed and not awkward.

The Pontang Community Health Center has implemented education in the form of counseling for mothers of infants and toddlers who come to the Posyandu. The counseling provided is related to traditional health practices, ranging from baby massage, consumption of traditional herbal medicine, and also red onion compress therapy and warm water therapy. Based on the initial survey results of the study, there were 16 respondents who had babies at the Posyandu, and the results showed that 14 of the respondents' babies experienced fever after immunization, while 2 respondents did not experience fever because they were immediately given paracetamol after immunization. From these respondents, data was obtained that 87.5% of respondents applied red onion compress therapy to reduce fever in infants after DPT immunization. The application of red onion compresses by respondents (infant mothers) was in line with the 100% immunization coverage at the Posyandu. It can be concluded that the counseling provided had an effect on reducing fever in infants and increasing DPT immunization at the Posyandu. Based on this, the researcher wanted to determine the effect of education using e-leaflets on mothers in Pontang Village in increasing their knowledge so that infants who have received DPT immunization do not experience high fever and, in the future, DPT immunization coverage can increase in the working area of the Pontang Community Health Center. Ways to reduce fever can be done physically (non-pharmacologically) by using heat energy through conduction and evaporation methods. One example of these conduction and evaporation methods is warm compresses. One innovative method of warm compresses that can be done is a combination of red onions (*Allium Cepa Varietas Ascalonicum*) (Harnani et al., 2019). Red onions (*Allium Cepa Varietas Ascalonicum*) can be used for compresses because they contain organic sulfur compounds, namely Allylcysteine Sulfoxide (Alliin). Cutting or slicing red onion bulbs releases the enzyme allinase, which breaks down blood clots, thereby improving blood circulation and allowing heat from inside the body to be more easily transferred to the peripheral blood vessels, thereby reducing fever (Harnani et al., 2019). Other compounds in red onions include glutamic acid, which is a natural essence (flavor enhancer), as well as volatile compounds such as propyl disulfide and propyl methyl disulfide. When used in appropriate doses, red onions can be used to reduce body temperature, particularly in children aged 1-5 years who experience elevated body temperature (Faridah et al., 2018).

## Methods

This type of research is quantitative, using an experimental design. The pre-experimental design used is a one-group pretest-posttest design. The independent variable in this study was the



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provision of education through e-leaflets on the consumption of shallots. The dependent variable in this study was mothers' knowledge about giving red onions to reduce fever after immunization. The steps to be taken in data collection are as follows: The researcher will coordinate with local officials to gather mothers with babies. The researcher will explain the purpose and objectives to the mothers (respondents). The researcher will give the respondents a pre-test and allow them approximately 5 minutes to complete it. The researcher will explain the material in the leaflet about red onion compresses. The researcher will distribute the e-leaflet to respondents through local midwives. The e-leaflet will be distributed via WhatsApp groups. The researcher will give the respondents approximately 30 minutes to reread the e-leaflet material. The researcher will give the respondents a post-test and allow them approximately 5 minutes to complete it. The researcher will collect the respondents' pre-test and post-test results, process the data, and analyze the research results. E-leaflets as an educational medium for respondents. E-leaflets have been tested for feasibility by a team of experts. Pre-test and post-test questionnaires to measure respondents' knowledge levels. Respondents' knowledge assessment aspects are: Good: if they score > 75, Poor: if they score 36-75, Fair: 0-35. The population of this study consisted of mothers with infants aged 0-12 months. The total population of mothers with children aged 0-12 months as of June 2024 was 30 people. The sample in the study used the entire population, consisting of 30 respondents, using total sampling. The test used in this study is Wilcoxon because the data is not normally distributed .

## Results

### 1. Respondent Characteristics

Table 1. Characteristics of Research Samples

Respondent Characteristics	Number (n)	Persentase (%)
<b>Year</b>		
17-25 year	6	16,7
26-35 year	21	70,0
➤ 35 year	4	13,3
Total	30	100
<b>Level of Education</b>		
High School	18	60,0
Diploma	6	20,0
Bachelor's Degree	6	20,0
Total	30	100
<b>Work</b>		
Housewife	20	66,6
Entrepreneur	5	16,7
Employee	5	16,7
Total	30	100

Based on the table above, the results show that the majority of respondents are aged 26-35 years old, accounting for 70% of the total. In terms of educational background, most respondents are high school graduates, accounting for 60% of the total. Regarding occupation, the majority of respondents are housewives, accounting for 66.6% of the total.

## 2. Respondents' Knowledge Before Receiving E-Leaflet Education on the Use of Red Onions to Reduce Fever After DPT Immunization in the following table:

Table 2 Respondents' knowledge before receiving e-leaflet education on the use of shallots to reduce fever after DPT immunization

Respondents' Knowledge	Total (n)	Percentase (%)
Low ( $\leq 35$ )	19	63,4
Fair (36-75)	10	33,3
Good ( $>75$ )	1	3,3
Total	30	100

Based on the table above, it can be seen that before being given the e-leaflet, most respondents' knowledge about the use of shallots to reduce fever after DPT immunization was still lacking, at 63.4%.

## 3. Respondents' Knowledge After Receiving E-Leaflet Education on the Use of Red Onions to Reduce Fever After DPT Immunization

Table 3 Respondents' knowledge after receiving e-leaflet education on the use of shallots to reduce fever after DPT immunization

Respondents' Knowledge	Total (n)	Percentase (%)
Low ( $\leq 35$ )	0	0
Fair (36-75)	3	10
Good ( $>75$ )	27	90
Total	30	100

Based on the table above, it can be seen that after being given the e-leaflet about the use of shallots to reduce fever after DPT immunization, the majority of respondents (90%) had good knowledge.

## 4. The Effect of E-Leaflet Education on the Use of Shallots to Increase Respondents' Knowledge About Reducing Fever After DPT Immunization in the following table:

Table 4 Effect of e-leaflet education on giving red onions to increase respondents' knowledge about reducing fever after DPT immunization

Respondents' Knowledge	Total (n)	Percentase (%)	Sig. (2-tailed)
No increase/Remains the same	2	6,7	0,000
Increase	28	93.3	
Total	30	100	

Based on the table above, it can be concluded that most respondents' knowledge increased by 93.3%. The Wilcoxon test showed that there was an effect of the e-leaflet education on red onion consumption on increasing respondents' knowledge about reducing fever after immunization, with a Sig value of 0.000.

## Discussion

### 1. Respondents' Knowledge Before Receiving E-Leaflet Education on the Use of Red Onions to Reduce Fever After DPT Immunization

Respondents' knowledge prior to being given the e-leaflet about the use of shallots to reduce fever after DPT immunization was still lacking for the most part. The results of this study are similar to previous studies which stated that the knowledge of respondents, namely cadres and mothers, was still lacking regarding shallot compresses (Nursyafaah et al., 2024). The results of this study differ from previous



research conducted by (Ilmi & Astuti, 2024), which stated that most respondents had sufficient knowledge before being given education through leaflets. It also differs from the results of research conducted by (Heryani et al., 2023), which stated that respondents had sufficient knowledge about red onion compresses before being given e-leaflets.

Health education is one step in the process of changing oneself to become healthier. According to Aryawati (2018), health education aims to reduce unhealthy behaviors in individuals, groups, and communities. One way to teach about health is through activities that help the community (Darmayanti & Raharjo, 2020). Education is the process of learning so that a person gains knowledge from what they previously did not know. Education is an effort to mature humans through counseling, teaching, or training (Aswan & Harahap, 2021).

The lack of public knowledge about the benefits of medicinal plants such as shallots for reducing fever in children is a common phenomenon. The public is more familiar with shallots as an ingredient for cooking, without knowing that they contain substances that can be used as an alternative in traditional medicine. The lack of public knowledge is also influenced by the fact that the Pontang Community Health Center has never provided education related to complementary traditional medicine.

The use of red onion compresses to reduce fever in children is rarely used by the community, especially after DPT immunization. This is because before immunization, mothers of infants/toddlers have received intervention from health workers to give fever-reducing medication after immunization so that children do not become fussy or to prevent fever. The use of fever-reducing medication has become commonplace as a form of KIPI treatment. Based on this habit, researchers began to educate the community/respondents to use complementary traditional medicine as a treatment option when infants/toddlers have a fever.

## **2. Respondents' Knowledge After Receiving E-Leaflet Education on the Use of Red Onions to Reduce Fever After DPT Immunization**

Respondents' knowledge after being given an e-leaflet about the use of red onions to reduce fever after DPT immunization was mostly good. The results of this study are similar to previous studies which stated that the knowledge of respondents, namely cadres and mothers, improved to good after being given education about red onion compresses (Nursyafaah et al., 2024). The results of this study are consistent with previous studies conducted by (Heryani et al., 2023), which stated that respondents have a good understanding of red onion compresses after receiving the e-leaflet.

In this study, the respondents' level of knowledge improved significantly. Knowledge is one of the predisposing factors that influence a person's behavior, including the use of traditional medicine. People of productive age find it easier to accept or remember new knowledge. Based on the theory explained by Mubarak in (Notoatmodjo, 2020) knowledge is an impression in the human mind as a result of using the five senses, which is known based on the experiences gained by each human being. It is necessary to increase knowledge in order to create a knowledgeable and broad-minded society. In addition, knowledge in the field of health, especially

medicine, is very important because by increasing our knowledge, we can learn things that can help us apply health science in our daily lives, such as the use of traditional medicine (Grace et al., 2024).

Researchers assume that providing health information to respondents can increase their knowledge regarding the treatment of fever after DPT immunization in infants. This increase in knowledge is expected to increase respondents' willingness to administer DPT immunization to infants.

### 3. The Effect of E-Leaflet Education on Red Onion Administration on Respondents' Knowledge of Fever Reduction After DPT Immunization

The Wilcoxon test results concluded that there was an effect of the e-leaflet on red onion administration on increasing respondents' knowledge about reducing fever after DPT immunization in the Pontang Community Health Center working area. This significant increase in knowledge shows that the educational strategy using e-leaflets is very effective in increasing public knowledge, especially for mothers of infants/toddlers. This education can generally be provided to the community to help them utilize complementary red onion compress treatment as a first step to reduce fever in children after immunization. The level of knowledge about complementary traditional medicine influences attitudes and behaviors regarding the use of herbal medicine, and the higher the level of knowledge, the higher the frequency of herbal medicine use (Viliastri et al., 2024).

Researchers assume that when respondents or the community begin to learn about health, they will be able to use this knowledge as a reference to improve their own health and that of their families independently. Knowledge about the benefits of various medicinal plants and herbal remedies is expected to be used by the community as a form of disease prevention. Knowledge about the use of red onion compresses obtained by mothers is expected to be one of the methods that can be used when babies have a fever without resorting to medication, thereby reducing the side effects of chemical drugs.

### Conclusion

Based on the results of this study, it can be concluded that 19 respondents still lacked knowledge about the use of shallots to reduce fever after DPT immunization before receiving the e-leaflet education. The respondents' knowledge after receiving e-leaflet education on the use of shallots to reduce fever after DPT immunization was still lacking in 27 respondents, and there was an effect of e-leaflet education on the use of shallots on increasing mothers' knowledge about reducing fever after DPT immunization with a Sig value of 0.000.

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