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Effectiveness Of The Kangaroo Method In Reducing Fever After Dpt1 Immunization In Infants Aged 2-4 Months

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ABSTRACT

DPT1 immunization is an important basic immunization that protects infants from diphtheria, pertussis, and tetanus. Despite its benefits, DPT1 immunization may cause side effects, including fever, which can lead to discomfort in infants and concern among parents. Kangaroo Mother Care (KMC), a skin-to-skin contact method between mother and infant, is a non-pharmacological intervention that promotes thermoregulation, comfort, and physiological stability in infants. This study aimed to determine the effectiveness of the kangaroo method in reducing fever following DPT1 immunization among infants aged 2–4 months. A quantitative approach was employed using a quasi-experimental design with a pretest-posttest group design. The study involved 20 infants who received DPT1 immunization and were selected through purposive sampling. The data were analyzed using univariate and bivariate analyzes with SPSS version 25. The Wilcoxon Match Pairs Test was used to assess differences in body temperature before and after the intervention. The findings revealed a significant reduction in body temperature following the application of the kangaroo method, with a p-value of 0.000 (<0.05). These results indicate that the kangaroo method is effective in reducing fever after DPT1 immunization in infants aged 2–4 months. Therefore, KMC can be considered a safe, simple, and effective non-pharmacological intervention for managing post-immunization fever in infants.

Keywords: Kangaroo Mother Care, fever, DPT1 immunization, infants

INTRODUCTION

Immunization is one of the most effective public health measures in preventing infectious diseases that can cause illness, disability, and even death in infants and children. In Indonesia, complete basic immunization is provided from birth to 11 months of age, including the Diphtheria, Pertussis, and Tetanus (DPT) immunization given at 2, 3, and 4 months of age. DPT immunization plays a crucial role in boosting infants' immunity against diphtheria, pertussis (whooping cough), and tetanus, which remain health

problems in various developing countries (Ministry of Health of the Republic of Indonesia, 2023).

Despite its significant benefits, DPT immunization often results in Post-Immunization Adverse Events (AEFI), both local and systemic. One of the most common AEFI is fever. Research by Izadi et al. (2023) reported that fever was the most common post-immunization event in infants after DTP-HB-Hib vaccination, with an incidence rate reaching 50.94% of the 1,119 infants studied. Post-immunization fever generally appears within 24–48 hours after injection as the body's natural response to antibody formation. However, this condition often causes anxiety in parents and can affect compliance with the next immunization schedule.

Globally, childhood immunization coverage continues to be a priority for the World Health Organization (WHO) because immunizations prevent millions of deaths each year. However, parental concerns about immunization side effects, particularly fever and pain after injection, remain a leading cause of delays or refusals in infant immunizations. Research shows that uncomfortable experiences after immunization can affect parents' perceptions of immunization safety and decrease adherence to the complete basic immunization program (Aini et al., 2024).

Fever following DPT immunization is an inflammatory response characterized by an increase in body temperature due to the release of pyrogen mediators. In some infants, fever can cause fussiness, sleep disturbances, decreased appetite, and even increased parental anxiety. Fever management is generally pharmacological using antipyretics. However, non-pharmacological methods are increasingly recommended due to their safety, ease of implementation, and minimal side effects. One such non-pharmacological intervention is the kangaroo mother care (KMC).

The kangaroo method is a form of care involving direct skin-to-skin contact between a baby and its mother or caregiver. This method has been widely used to improve the baby's physiological stability, including regulating body temperature, heart rate, and breathing, as well as increasing comfort and emotional bonding between mother and baby. The skin-to-skin contact that occurs during the kangaroo method allows for the natural transfer of body heat, helping to maintain the baby's temperature stability. Furthermore, the kangaroo method can also reduce stress and increase comfort in babies through the sensory and emotional stimulation provided by the mother (Liu et al., 2026).

Research conducted by Simanungkalit, Resmaniasih, and Nice (2023) on the kangaroo method for infants after DPT immunization in Palangka Raya City showed that the kangaroo method affected infants' body temperature after immunization. The study explained that direct skin-to-skin contact between mother and baby can help maintain a stable infant body temperature and has the potential to be an alternative treatment for post-immunization fever that is easy for families to implement. Furthermore, this method does not require additional costs or special equipment, making it highly suitable for use in primary healthcare settings and at home.

Based on the above description, the high incidence of fever after DPT immunization and the importance of safe and easy-to-implement non-pharmacological interventions are the reasons why it is necessary to conduct research on the effectiveness of the kangaroo method in reducing fever after DPT1 immunization in infants aged 2–4 months.at Seruni 1 and 3 Integrated Health Posts (Posyandu) in Purwoasri Village, Malang Regency. The results of this study are expected to provide alternative nursing and midwifery interventions in managing post-immunization fever, as well as improve infant comfort and parental confidence in the immunization program.

METHOD

This study used a quantitative method with a quasi-experimental design and a pretest-posttest group design. The population was all infants aged 2–4 months who received the DPT1 immunization. A sample of 20 infants was selected using a purposive sampling technique.

Data collection was conducted by measuring the infant's body temperature before (pretest) and after (posttest) the kangaroo method intervention. Data analysis was conducted univariately and bivariately using the SPSS version 25 application with the Wilcoxon Match Pairs Test. The significance level used in this study was $\alpha = 0.05$. If the p-value <0.05, then the kangaroo method is declared effective in reducing fever after DPT1 immunization in infants aged 2–4 months.

RESULTS AND DISCUSSION

Univariate Analysis

Table 1. Frequency Distribution of Respondent Characteristics

Information	n	%
Mother's age		

<20 years	2	10
20 – 35 years	16	80
>35 years	2	10
Mother's Education		
JUNIOR HIGH SCHOOL	1	5
SENIOR HIGH SCHOOL	12	60
PT	7	35
Mother's Job		
Housewife	13	65
Work	7	35
Exclusive Breastfeeding		
Yes	15	75
No	5	25
Total	**20**	**100**

Based on the Respondent Characteristics Table, it can be seen that the majority of mothers who responded were in the 20–35 years age range, namely 16 people (80%), while mothers aged <20 years and >35 years each numbered 2 people (10%). These results indicate that the majority of respondents were at a healthy reproductive age, namely an age when biologically and psychologically they are considered more mature in caring for babies and making decisions regarding children's health.

Based on education level, the majority of respondents (12 respondents) had a high school education, followed by 7 (35%) and 1 (5%) with a college education. A relatively high level of education can influence a mother's ability to receive health information, understand the benefits of immunization, and provide appropriate care for her baby after immunization.

Based on occupation, the majority of respondents were housewives (13 respondents, 65%), while 7 respondents (35%) were working mothers. The predominance of housewives indicates that most respondents had more time to accompany and care for their babies, including providing kangaroo care as a way to manage post-immunization fever.

Based on the history of exclusive breastfeeding, the majority of infants received exclusive breastfeeding (15 infants (75%), while 5 infants (25%) did not receive exclusive

breastfeeding. The high proportion of exclusive breastfeeding indicates that the majority of infants received optimal nutrition, which can support their immune system and recovery after immunization.

Overall, the characteristics of the respondents indicated that the majority of mothers were of healthy reproductive age, had secondary to higher education, were housewives, and exclusively breastfed their infants. These characteristics could be supporting factors in the successful implementation of the kangaroo method for infants experiencing fever after DPT1 immunization.

Bivariate Analysis

Table 2. Effectiveness of the Kangaroo Method in Reducing Fever

		Fever After			
		Yes	No	Total	P-value
Fever Before	Yes	4	16	20	
Total		4	16	20	0.00

Based on the table above, it is known that before the kangaroo method intervention, all 20 infants (100%) who participated in the study experienced fever after DPT1 immunization. After the kangaroo method was administered, the number of infants still experiencing fever decreased to 4 (20%), while 16 (80%) were no longer fever-free.

The results showed a decrease in the number of infants experiencing fever after kangaroo care. Of the 20 infants who had fever before the intervention, 16 experienced a decrease in body temperature and were no longer feverish after kangaroo care. Meanwhile, only four infants remained feverish after the intervention.

Based on the results of statistical analysis using the Wilcoxon Matched Pairs Test, a p-value of 0.000 was obtained. This value is smaller than the specified significance level ($\alpha = 0.05$), so H_0 is rejected and H_1 is accepted. Thus, there is a significant difference between fever conditions before and after the administration of the kangaroo method.

The results of this study indicate that the kangaroo method is effective in reducing fever after DPT1 immunization in infants aged 2–4 months.

Based on the research results, it was found that before (pretest) the kangaroo method was administered, all 20 infants (100%) experienced fever after DPT1

immunization. Fever is one of the Adverse Events Following Immunization (AEFI) that often occurs after DPT vaccination due to the body's immune response to the incoming antigen. This reaction indicates that the immune system is forming antibodies to provide protection against diphtheria, pertussis, and tetanus. Post-immunization fever generally occurs within 24–48 hours after vaccination and is temporary (CDC, 2024; Kliegman et al., 2023).

The pretest results, which showed that all respondents had a fever, indicate that most infants exhibited the same physiological response to the DPT1 immunization. According to Kliegman et al. (2023), the increase in body temperature after immunization is caused by the release of inflammatory mediators such as interleukins and prostaglandins, which affect the temperature-regulating center in the hypothalamus. This is a normal process that indicates the body is building immunity to the disease targeted by the vaccine.

After receiving the kangaroo method (posttest), the number of infants with fever decreased to 4 (20%), while 16 (80%) no longer had a fever. These results indicate a change in body temperature after the intervention. The kangaroo method, or Kangaroo Mother Care, is a form of care through direct skin-to-skin contact between mother and baby that can help maintain a stable body temperature, increase comfort, and reduce physiological stress in infants (World Health Organization [WHO], 2023).

The decrease in fever in infants following kangaroo care can be explained by the natural thermoregulatory mechanisms that occur during skin-to-skin contact between mother and baby. The mother's body functions as a natural temperature regulator, able to adjust to the baby's body temperature needs. Furthermore, direct skin-to-skin contact can increase the release of the hormone oxytocin, which has a calming effect, helping to reduce the stress response and discomfort experienced by infants after immunization (Perry et al., 2022; Sivanandan & Sankar, 2023).

The results of this study align with those of Sivanandan and Sankar (2023), who stated that the kangaroo method is effective in improving infant physiological stability, including maintaining body temperature within the normal range. Another study by Lazarus et al. (2024) also explained that skin-to-skin contact between mother and infant provides significant physiological benefits, such as improved body temperature regulation, stable heart rate, and increased infant comfort.

Based on the statistical test results using the Wilcoxon Match Pairs Test, a p-value of 0.000 (<0.05) was obtained. These results indicate a significant difference between fever conditions before and after the kangaroo method. Thus, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted, which means the kangaroo method is effective in reducing fever after DPT1 immunization in infants aged 2–4 months. According to Dahlan (2021), a p-value smaller than 0.05 indicates that the difference is not caused by chance factors, but by the influence of the intervention given.

The success of the kangaroo method in this study may also be influenced by the characteristics of the respondents, most of whom were exclusively breastfed. Babies who are exclusively breastfed have a stronger immune system because breast milk contains various immunological components that help boost the baby's immune system. Furthermore, the mother's use of the kangaroo method can increase emotional closeness, making the baby calmer and more comfortable during the post-immunization recovery period (WHO, 2023; Hockenberry & Wilson, 2023).

Overall, the results of the study showed that the number of infants experiencing fever decreased from 20 infants (100%) in the pretest to 4 infants (20%) in the posttest with a p-value of 0.000. These findings prove that the kangaroo method is a safe, easy-to-implement, inexpensive, and effective non-pharmacological intervention in helping reduce fever after DPT1 immunization in infants aged 2–4 months. Therefore, the kangaroo method can be recommended as one of the actions that mothers can take to manage post-immunization fever in infants (WHO, 2023; Sivanandan & Sankar, 2023).

CONCLUSION AND SUGGESTIONS

Based on the research results, it can be concluded that the kangaroo method is effective in reducing fever after DPT1 immunization in infants aged 2–4 months. This is evidenced by a decrease in the number of infants experiencing fever after the kangaroo method intervention, as well as the Wilcoxon test results showing a p-value of 0.000 (<0.05).

The kangaroo method can be used as a safe, easy, and effective non-pharmacological intervention to help reduce post-immunization fever in infants. Healthcare workers are expected to educate parents about the kangaroo method, and

further research is recommended using a larger sample size to achieve more optimal results.

BIBLIOGRAPHY

Aini, AN, Rachmawan, I., & Winarna, NBA (2024). The effect of warm water compresses on injection sites on pain responses in infants aged 2–4 months after DPT-HB-Hib immunization. WOMB Midwifery Journal, 3(2).

Centers for Disease Control and Prevention. (2024). General Best Practice Guidelines for Immunization. CDC.

Dahlan, MS (2021). Statistics for Medicine and Health (7th Edition). Jakarta: Indonesian Epidemiology.

Hockenberry, M. J., & Wilson, D. (2023). Wong's Nursing Care of Infants and Children (13th ed.). Elsevier.

Izadi, S., Mohammadi, M., Sartipi, M., Karami, M., & Karimi, H. (2023). Acute adverse events following immunization with DTP-HB-Hib pentavalent vaccine in the first year of life. Eastern Mediterranean Health Journal, 29(1), 48–56.

Ministry of Health of the Republic of Indonesia. (2022). Guidelines for the implementation of routine immunization for infants and toddlers in Indonesia. Jakarta: Ministry of Health of the Republic of Indonesia.

Ministry of Health of the Republic of Indonesia. (2023). Indonesian Health Profile 2023. Jakarta: Ministry of Health of the Republic of Indonesia.

Ministry of Health of the Republic of Indonesia. (2024). Maternal and Child Health (KIA) Book Revised Edition. Jakarta: Ministry of Health of the Republic of Indonesia.

Kliegman, R.M., St. Geme, J. W., Blum, NJ, Shah, SS, & Tasker, R. C. (2023). Nelson Textbook of Pediatrics (22nd ed.). Elsevier.

Lazarus, M.F., Marchman, V.A., Brignoni-Pérez, E., et al. (2024). Inpatient skin-to-skin care predicts 12-month neurodevelopmental outcomes in very preterm infants. The Journal of Pediatrics, 270, 114–121.

Liu, Y., Xu, J., Wang, T., Shi, Z., Chen, X., Kong, Y., et al. (2026). The immediate effect of kangaroo maternal care on mother–infant inter-brain synchrony and infant brain function. Preprints, arXiv.

Perry, S. E., Hockenberry, M. J., Lowdermilk, D. L., & Wilson, D. (2022). Maternal Child Nursing Care (7th ed.). Elsevier.

Simanungkalit, HM, Resmaniasih, K., & Nice, S. (2023). Kangaroo method on infant body temperature after DPT immunization in the working area of the Palangka Raya City Community Health Center. Palembang Health Polytechnic Journal, 18(1), 7–13.

Sivanandan, S., & Sankar, M. J. (2023). Kangaroo mother care for preterm or low birth weight infants: A systematic review and meta-analysis. BMJ Global Health, 8(6), e010728.

UNICEF. (2023). The State of the World's Children 2023: For every child, vaccination. New York: UNICEF.

World Health Organization. (2022). Vaccines and immunization: What is vaccination? Geneva: WHO.

World Health Organization. (2023). Immunization agenda 2030: A global strategy to leave no one behind. Geneva: WHO.

World Health Organization. (2023). Kangaroo Mother Care: A Practical Guide. Geneva: WHO.