THE EFFECT OF ALOE VERA COMPRESS ON REDUCING BODY TEMPERATURE IN CHILDREN WITH FEVER AFTER PENTAVALENT DPT IMMUNIZATION

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ABSTRAK : PENGARUH KOMPRES LIDAH BUAYA (ALOE VERA) TERHADAP PENURUNAN SUHU TUBUH ANAK DENGAN DEMAM PASCA IMUNISASI DPT PENTAVALENT

Latar Belakang : Angka Kejadian Ikutan Paska Imunissai (KIPI) di Puskemas Kalibagor dari bulan Januari sampai bulan Oktober 2022 sebanyak 10 kasus. Kejadian kasus tersebut tersebar di 8 desa Wilayah Kecamatan Kalibagor, dan sudah tertangani dengan baik tanpa meninggalkan efek kecacatan fisik. KIPI terbanyak adalah demam pada anak pasca diberikan imunisasi DPT-Pentavalent. Upaya - upaya yang telah dilakukan untuk menurunkan demam pasca imunisasi DPT *Pentavalent* pada anak adalah pemberian terapi farmakologi dan terapi non-farmakologi. Salah satu terapi non-farmakologi dapat dilakukan dengan pemberian kompres, dimana pemberian kompres merupakan tindakan pertama secara mandiri yang dapat dilakukan perawat maupun orang tua. Kompres tidak harus selalu menggunakan air hangat, salah satu metode kompres lain yang dapat diberikan pada anak yang mengalami demam adalah metode kompres dengan lidah buaya (*Aloe vera*). Kompres *aloe vera* bekerja dengan prinsip konduksi dimana kandungan air di gel *aloe vera* berfungsi untuk mengeluarkan panas, sehingga panas dari tubuh responden pindah kedalam *aloe vera*. Konduksi terjadi antara suhu aloevera dengan jaringan sekitarnya termasuk pembuluh darah yang melalui area tersebut dapat menurunkan suhu. Kemudian darah akan mengalir kebagian tubuh lain dan proses konduksi berlangsung sehingga setelah dilakukan kompres menggunakan aloevera suhu tubuh akan menurun.

Tujuan: Melakukan analisis terhadap pengaruh kompres lidah buaya (Aloe vera) terhadap penurunan suhu tubuh anak dengan demam pasca imunisasi DPT Pentavalent, mendeskripsikan suhu tubuh anak sebelum dan sesudah diberikan kompres dengan Aloe Vera, dan menganalisis pengaruh kompres lidah buaya terhadap penurunan suhu tubuh anak dengan demam pasca imunisasi DPT Pentavalent.

Metode: Penelitian ini menggunakan jenis penelitian kuantitatif dengan desain penelitian quasi eksperimen (penelitian semu) dengan pendekatan one group pre test-post test design. Observasi dalam penelitian ini berupa pengukuran suhu tubuh bayi dilakukan 2 kali yaitu sebelum dan sesudah perlakuan (pemberian kompres aloe vera). Populasi dalam penelitian ini adalah semua bayi umur 2 – 4 bulan pada bulan Januari 2023 yang mengikuti imunisasi DPT Pentavalent di desa Kaliori Wilayah Kerja Puskesmas Kalibagor Tahun 2023. Jumlah bayi umur 2-4 bulan di bulan April 2023 sebanyak 32 bayi yang juga merupakan sampel penelitian. Penelitian ini dilakukan di Wilayah Kerja Puskesmas Kalibagor Kabupaten Banyumas. Instrumen penelitian yang digunakan adalah thermometer digital, lembar informed consent, lembar observasi dan SOP pemberian kompres aloe vera.

Hasil: Suhu bayi pasca imunisasi imunisasi DPT Pentavalent sebelum diberikan kompres aloe vera seluruhnya mengalami demam (suhu >37,50C). Sesudah diberikan kompres aloe vera sebagian besar bayi mempunyai suhu normal yaitu 20 orang (62,5%) dan sisanya 12 orang (37,5%) masih demam. Hasil uji normalitas *Kolmogorrov smirnov* data suhu tubuh anak sebelum dan sesudah diberikan kompres aloe vera menunjukkan nilai sig = 0,000, artinya data berdistribusi tidak normal (sig < 0,05). Dengan demikian uji beda yang digunakan adalah uji *Uji Wilcoxon Test* dengan nilai *p-value* = 0,0001 (p <0,005), dapat diartikan ada perbedaan yang signifikan antara suhu sebelum dan sesudah diberikan kompres *aloe vera.*

Kesimpulan: ada pengaruh pemberian kompres aloe vera terhadap penurunkan suhu tubuh anak dengan demam paska imunisasi DPT *Pentavalent*.

Kata Kunci : Aloe Vera ,Demam, DPT, Imunisasi

ABSTRACT

Background**:** The incidence of Adverse Events Following Immunization (KIPI) at Kalibagor Public Health Center from January to October 2022 reached 10 cases, distributed across eight villages in Kalibagor Subdistrict. All cases were managed properly without resulting in permanent physical disability. The most common AEFI was fever in children following DPT-Pentavalent immunization. Efforts to reduce fever after DPT-Pentavalent

immunization include pharmacological and non-pharmacological therapies. One of the non-pharmacological interventions is compress therapy, which can be independently applied by nurses or parents. Compresses do not necessarily require warm water; an alternative method is aloe vera compress. Aloe vera compress works through conduction, as the water content in aloe vera gel absorbs body heat, transferring heat from the child's body into the aloe vera. Conduction occurs between the aloe vera and surrounding tissues, including blood vessels, thereby lowering body temperature. The cooled blood then circulates throughout the body, continuing the conduction process until the body temperature decreases.

Objective: To analyze the effect of aloe vera compresses on reducing body temperature in children experiencing fever after DPT-Pentavalent immunization, to describe body temperature before and after aloe vera compress application, and to examine the significance of the intervention on temperature reduction.

Methods: This study employed a quantitative approach with a quasi-experimental design using a one-group pretest–posttest method. Body temperature was measured twice, before and after aloe vera compress application. The study population consisted of all infants aged 2–4 months in January 2023 who received DPT-Pentavalent immunization in Kaliori Village, Kalibagor Public Health Center, Banyumas Regency. In April 2023, there were 32 infants aged 2–4 months, all of whom were included as the research sample. Research instruments included a digital thermometer, informed consent forms, observation sheets, and standard operating procedures (SOPs) for aloe vera compress application.

Results**:** Prior to aloe vera compress application, all infants developed fever (temperature >37.5°C) after DPT-Pentavalent immunization. Following the intervention, most infants (20 infants; 62.5%) returned to normal body temperature, while 12 infants (37.5%) still had fever. The Kolmogorov–Smirnov normality test showed a significance value of 0.000, indicating non-normal data distribution ($p < 0.05$). Therefore, the Wilcoxon signed-rank test was applied, yielding a p-value of 0.0001 ($p < 0.005$). This result indicates a significant difference in body temperature before and after aloe vera compress application.

Conclusion**:** Aloe vera compress application significantly reduces body temperature in children with fever following DPT-Pentavalent immunization.

Keywords: Aloe Vera, DPT, Fever, Immunization

INTRODUCTION

Immunization is an effort to induce or enhance an individual's active immunity against a particular disease, so that when exposed to the disease in the future, the individual will either not develop the illness or experience only mild symptoms. Immunization is mandatory for children, including the administration of the Diphtheria-Pertussis-Tetanus-Hepatitis B-Haemophilus influenzae type B vaccine, commonly known as the DPT Pentavalent vaccine. The DPT/HB/HiB vaccine is administered to infants in three doses at one-month intervals to prevent Diphtheria, Pertussis, Tetanus, Hepatitis B, and Haemophilus influenzae type B infections. (Hadianti DN et al., 2014).

A vaccine is an antigen (either an inactivated microorganism or an attenuated live microorganism) that has been processed into a toxoid, recombinant protein, or other form, which, when administered, induces specific active immunity against certain infectious diseases. Medical events associated with immunization—such as vaccine-related effects, adverse reactions, toxicity, hypersensitivity reactions, pharmacological effects, program errors, coincidental occurrences, injection-related reactions, or indeterminate causal relationships—are referred to as Adverse Events Following Immunization (AEFI). (Cahyaningrum et al., 2016; WHO, 2022).

Adverse Events Following Immunization (AEFI) may manifest as part of the immune response process, ranging from mild local and systemic reactions—such as fever, pain, redness or swelling at the injection site, headache, myalgia, and arthralgia—to severe reactions such as seizures and anaphylactic shock (WHO, 2022). Mild local reactions, particularly from vaccines containing DTP, such as pain, redness, and swelling, have been reported in approximately 40–80% of cases.

The incidence of Adverse Events Following Immunization (AEFI) at Kalibagor Public Health Center from January to October 2022 was recorded at 10 cases. These cases were distributed across eight villages within the Kalibagor District and were all properly managed without resulting in permanent physical disability. The most frequent AEFI observed was fever in children following administration of the DPT-Pentavalent vaccine. Efforts undertaken to reduce post-immunization fever in children included both pharmacological and non-pharmacological therapies. Pharmacological therapy involved the administration of antipyretics (such as paracetamol and ibuprofen). Paracetamol

syrup is considered relatively safe; however, it still carries potential side effects, including hepatotoxicity, fatal hepatic necrosis, renal tubular necrosis, and hypoglycemic coma when used in excessive doses over prolonged periods. (Aden (2010) dalam (Erlita.c & Putri. E, 2016).

Non-pharmacological therapy can be carried out through the application of compresses, which serve as an initial independent intervention that may be performed by either nurses or parents. Several types of compresses can be applied to reduce a child's body temperature, including warm wet compresses, warm dry compresses using plain water, cold dry compresses with ice packs, or adhesive cooling patches.

Compresses do not always have to involve warm water; another method that can be applied to children with fever is the use of aloe vera (Aloe vera) compresses. Aloe vera is an agricultural commodity and a traditional remedy that is easily accessible, as it is widely sold by ornamental plant vendors due to its aesthetic appearance as well as its medicinal properties, including its ability to reduce fever in children. Aloe vera contains a clear gel composed of approximately 95% water. This gel layer also contains amino acids, glucomannan, lipids, vitamins, and sterols.

The aloe vera compress works on the principle of conduction, in which the water content in the aloe vera gel facilitates heat transfer, allowing body heat from the respondent to be absorbed into the aloe vera. Conduction occurs between the temperature of the aloe vera and the surrounding tissues, including the blood vessels in the area, thereby reducing body temperature. Subsequently, the cooled blood circulates to other parts of the body, and the conduction process continues, resulting in a decrease in body temperature after the application of an aloe vera compress (As Seggaf, 2017). Based on the aforementioned issues, the researcher is interested in investigating the effectiveness of aloe vera compresses in reducing body temperature among children experiencing fever following DPT-Pentavalent immunization.

The research problem of this study is formulated as follows: "What is the effect of aloe vera (Aloe vera) compresses on reducing body temperature in children with fever following DPT-Pentavalent immunization?"

RESEARCH METHODS

This study employed a quantitative research design using a quasi-experimental approach with a one-group pretest–posttest design. It is referred to as a quasi-experimental study because it does not fully possess the characteristics of a true experimental design, as certain variables that should ideally be controlled or manipulated could not be controlled or were difficult to control (Notoatmodjo, 2018). The study was conducted on a single group of children experiencing fever following DPT-Pentavalent immunization, who received the intervention in the form of aloe vera compresses.

Observations were carried out twice, namely before and after the intervention. The measurement prior to the intervention was referred to as the pretest, while the measurement after the intervention was referred to as the posttest. The research was conducted within the working area of Kalibagor Public Health Center, Banyumas Regency. This study was conducted from September 2022 to June 2023, in accordance with the schedule set by the Applied Bachelor of Midwifery Program, Semarang. The population of this study consisted of all infants aged 2–4 months in January 2023 who received DPT-Pentavalent immunization in Kaliori Village, the working area of Kalibagor Public Health Center in 2023. The total number of infants aged 2–4 months in April 2023 was 32. Since the population was fewer than 100, a total sampling technique was applied, in which the sample size was equal to the population..

RESEARCH RESULTS

Univariate Analysis

Table 1
Description of infants' body temperature prior to the administration of aloe vera compresses

Body Temperature	Normal		Fever	
	f	%	f	%
Before compresses	0	0	32	100
After Compreses	20	62,5	12	37,5

Primary Data, 2023.

Based on Table 1, the body temperature of infants after DPT-Pentavalent immunization showed that all respondents experienced fever (temperature >37.5°C) prior to the administration of aloe vera compresses. Following the intervention, the majority of infants, namely 20 (62.5%), had normal body temperature, while the remaining 12 (37.5%) continued to experience fever.

Bivariate Analysis

The statistical test used in this study was the Paired t-test, which requires a prior test of data normality. The Kolmogorov–Smirnov normality test results for the body temperature of children before

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and after the administration of aloe vera compresses showed a significance value of p = 0.000, indicating that the data were not normally distributed (p < 0.05). Therefore, the difference test applied was the Wilcoxon test.

Table 2
Analysis of the Effect of Aloe Vera Compresses on Body Temperature Reduction

Body Temperatue	Normal**		Fever***		*p-value*
	f*	%	f	%	
Before intervention	0	0	32	100	0,0001
After intervention	20	62,5	12	37,5	

* = frequency
**= temperature ≤ 37,5^{0}C
***= temperature enak > 37,5^{0}C

Based on Table 2, it can be seen that after DPT-Pentavalent immunization, 100% of the children experienced fever before the administration of aloe vera compresses. After the intervention, the majority of children (20; 62.5%) had normal body temperature, while the remaining 12 (37.5%) still had fever.

This shows a difference of 20 cases before and after the intervention. The results of the Wilcoxon test yielded a p-value = 0.0001 (p < 0.005), indicating a statistically significant difference between body temperature before and after the administration of aloe vera compresses. Thus, it can be concluded that aloe vera compress administration has a significant effect on reducing body temperature in children with fever following DPT-Pentavalent immunization.

DISCUSSION

The results of the study showed that after DPT-Pentavalent immunization, all infants experienced fever (temperature >37.5°C) before the administration of aloe vera compresses. Following the intervention, the majority of infants (20; 62.5%) had normal body temperature, while the remaining 12 (37.5%) continued to experience fever.

This study is in line with the findings of Purnomo et al. (2019), who reported that body temperature in children aged 3–6 years decreased to normal levels in 71.5% of cases after the administration of aloe vera compresses. Similarly, Fajariyah (2016) stated that children hospitalized at RSUD Ungaran experienced a temperature reduction of 0.13°C after receiving aloe vera compresses for 2 × 24 hours. In addition, Zulfariani (2019) found that following aloe vera compress treatment, the body temperature of a child (An.N) decreased from 37.5°C to 36.5°C. These results are consistent with those of As Seggaf (2019), who reported a reduction in body temperature among preschool children with fever at Siantan Hilir Public Health Center after the intervention of aloe vera compresses.

The results of the Wilcoxon test showed a p-value = 0.0001 (p < 0.005), indicating a significant difference in body temperature before and after the administration of aloe vera compresses. Thus, it can be concluded that aloe vera compress administration has a significant effect on reducing body temperature in children with fever following DPT-Pentavalent immunization.

The findings of this study are consistent with those of As Seggaf (2017), who reported a significant difference in body temperature before and after the administration of aloe vera compresses. Similarly, Zulfariani (2019) found that after nursing care using aloe vera compresses for 2 × 24 hours, the body temperature of a child (An.N) decreased from 37.5°C to 36.5°C. In line with this, Fajariyah (2016) reported a difference in body temperature among school-aged children with fever before and after aloe vera leaf compresses at RSUD Ungaran, Semarang Regency, with a reduction of 0.13°C. Likewise, Purnomo, Yuli, and Siti (2019) concluded that aloe vera compress administration had an effect on reducing body temperature in children aged 3–6 years with fever. Supporting evidence was also found in Muzdhalifah (2017), who demonstrated that aloe vera compresses significantly influenced changes in body temperature among patients with fever, resulting in a reduction of 0.48°C.

The use of aloe vera compress therapy serves as an alternative treatment for reducing fever in children, as it does not force the child to cry. Its cooling sensation, absence of unpleasant odor, and the possibility for the child to remain lying down without being disturbed make it a more comfortable

option.

CONCLUSION

All children experienced fever (temperature > 37.5°C) following DPT-Pentavalent immunization. After the administration of aloe vera compresses, the majority of infants (20; 62.5%) achieved normal body temperature, while 12 (37.5%) continued to have fever.

The effect of aloe vera compress administration on reducing body temperature in children with post–DPT-Pentavalent immunization fever was confirmed by a p-value = 0.000 (p < 0.005).

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