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Effectiveness of Warm Compress and Cold Compress For Pain Management in Dpt-Hb-Hib Immunization at BPM "D" Neglasari Tangerang City Banten In 2020

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ABSTRACT

Every child must receive immunizations that have been regulated by the Government to prevent diseases that can be prevented by immunization (PD3I). One of the immunizations is DPT-HB-Hib. However, 90% of infants' parents are afraid to receive immunization for their children because of the side effects. Therefore, babies who will be immunized are given warm compress or cold compress to help reduce pain after DPT-HB-Hib immunization.

This research was conducted to compare and analyze the effectiveness of warm compress with cold compress in the management of pain in infants after DPT - HB - Hib immunization. The research design used a Quasi-Experimental with two group pretest posttest designs, involving a total sample of 30 using the Total Sampling Technique. The instrument used was the FLACC scale to assess the condition of the infants before and after compressing and immunization, in which cold compress carried out 10 minutes before the immunization, while warm compress were carried out 15 minutes before immunization. The data distribution was tested for its normality using the Shapiro-Wilk test, the data were analyzed using the nonparametric Wilcoxon test and the Mann Whitney test.

The Wilcoxon test results showed that both of them have an effect on pain by getting the sig value. of $0.001 \leq 0.05$. Based on Whitney's mann test analysis, the mean difference of before and after the warm compress was 23, while before and after the cold compress was 8.

The comparison of the effectiveness of warm compress and cold compress in pain management had a p-value of 0.000 indicating that there was an influence in pain management. It is expected that the midwife can perform compress to help decreasing the pain in babies so as to reduce the fear of the infants' parents.

Keywords: Warm Compress, Cold Compress, Immunization

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BACKGROUND

In the context of quality generation preparation, it is necessary to prevent various diseases by carrying out immunizations on diseases that can be prevented by immunization (PD3I) (Hadianti, et. al). According to Law no. 36 of 2009 on Health, every child has the right to get basic immunization. Regulation of Minister of Health Number 12 of 2017 also states that the government must provide complete basic immunization to children including 1 dose of Hepatitis B (HB), 1 dose of Bacillus Calmette-Guérin (BCG), 3 doses of Diphtheria, Pertussis, Tetanus, Hepatitis B and Haemophilus influenza type B (DPT-HB-Hib), 4 doses of polio drops or oral polio vaccine (OPV), and 1 dose of measles or measles rubella (MR).

Immunization can prevent diseases including tuberculosis (TB), diphtheria, tetanus, hepatitis B, pertussis, measles, rubella, polio, meningitis, and pneumonia. Immunization is a form of preventive health intervention that has proven to be the most cost-effective method (cheap) (Ministry of Health of RI, 2019). Complete basic immunization should have been obtained under the age of 1 year old. However, it is not uncommon for babies not to receive immunization due to their parents' refusal because they are afraid of the side effects. Therefore this affects the immunization drop out (DO) rate. The DO rate in 2016 to 2017 has increased from 2.4% to 4.1%, indicating that more and more babies were not immunized (Ministry of Health of RI, 2019).

The side effects shown after immunization are usually called Adverse Events Following Immunization (AEFI). AEFI often occurs after DPT-HB-Hib immunization because it has reactions such as swelling, pain, redness at the injection site, and fever (Hadianti, et. al).

Concern need to be focused on AEFI of DPT - HB - Hib immunization because the incidence of diphtheria in Banten has reached 695 cases and 4 cases of non-neonatal tetanus. Meanwhile, DPT - HB - Hib vaccine is generally given not only once, but 3 times to babies aged 2,3,4 months to prevent diphtheria, tetanus, pertussis (whooping cough), hepatitis B, and type B Haemophilus influenza infection simultaneously (WHO, 2020; Hadianti et al., 2015).Based on data from Basic Health Research (Riskesdas) in 2013, Indonesia reported that there were 33.4% of children who had AEFI from 91.3% of children who received immunizations, in which the symptoms are redness by 20.6%, swelling by 20.2%, high fever by 6.8%, and purulent by 6%. However, in Neglasari District, Tangerang City, there were only mild AEFI incidents whose data were not reported to the Neglasari Public Health Center (Vero, 2020).

The immunization target in 2018 of Strategic Plan (Renstra) of Ministry of Health was 92.5%. Indonesia's immunization coverage itself is still at 90.61%. This shows a decrease from the previous year which was 91.12%, in which Banten Province itself still has not reached its target, as it was still at 91.73% (Ministry of Health, 2019).

In addition to the achievement of the Ministry of Health's Strategic Plan targets, the indicator of immunization success is if the rate reaches the Universal Child Immunization (UCI) target. UCI is the target of a village or sub-village whose more than 80% of the infants have received complete basic immunization (Ministry of Health, 2015). UCI coverage in Banten Province is at 87.5%. Even though the UCI coverage for Banten Province has reached the target, the UCI coverage for Tangerang City in 2020 has still not reached the target, which was only 43.58%. Meanwhile, UCI coverage in Neglasari District was still 46.27%, indicating that the immunization coverage was far from the target (Ministry of Health, 2019).

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In order to minimize pain in reducing AEFI, both pharmacological and non-pharmacological methods can be employed. The pharmacological method can be given by providing paracetamol every 15 mg/kg body weight every 4 hours (a maximum of 6 times in 24 hours). Meanwhile, the non-pharmacological method that can be done is compressing the area to be injected. Such intervention is considered to have the ability to reduce pain in infants.

According to research previously done by Yusni (2016), warm compress can reduce the intensity of injection pain because it build a calmer psychological effect. Based on research carried out by Price & Wilson (2005), pain due to bruising, muscle spasm, and arthritis responds well to increased temperature because it dilates blood vessels and increases local blood flow. Therefore, increasing the temperature transmitted through a warm compress can relieve pain by eliminating several causes of inflammation, such as bradykinin, histamine, and prostaglandins which will cause local pain.

However, another research which was done by Endah (2015) found that cold compress can also reduce pain due to immunization by releasing endorphins so that they can block the transmission of larger and faster A-beta sensory nerve fibers, and can also reduce pain transmission in C and delta A fibers so that the synaptic gate closes the transmission of pain implants. Perry (2014) further argued that cold compress are capable of being a local anesthetic which has therapeutic benefits for reducing local pain such as injection pain. The injection during immunization can cause trauma to toddlers and will continue as an unpleasant experience. Ice compress when applied to the source of pain such as a needle prick can reduce the production of prostaglandins so that the sensitivity of the pain receptors is reduced. Such warm and cold compress therapy can be provided before the injection when the infant's condition is not crying, hysterical, or unable to be kept quiet (Ndede, 2015).

Based on the immunization incidence at BPM "D", among 30 parents, most of them (90%) were worried about the effects of Diphtheria Pertussis Tetanus (DPT-HB-HIB) immunization, so they were hesitant to get their children immunization although the side effects occurred is a natural thing. Since DPT - HB - Hib immunization is important, as health workers who inject immunizations, midwives need to provide appropriate therapy to reduce AEFI cases due to immunization. Thus, researchers will compare the effectiveness of non-pharmacological therapies in the form of warm compress and cold compress to reduce pain in infants who will receive DPT - HB -Hib immunization.

METHODS

This research was conducted through quasi-experimental design of a two group pre-test post-test approach. The objective of this study was to determine the effectiveness of warm and cold compress in handling pain after DPT - HB - Hib immunization at BPM "D" Neglasari District, Tangerang City, Banten in 2020. The variables measured before immunization were carried out, in which warm compress was given 15 minutes before immunization, while cold compress was given 10 minutes before immunization, and 5 minutes after immunization.

This study involved a population consisting of 30 infants who received immunization at BPM "D" in December 2020, met the inclusion and exclusion criteria, as well as willing to participate in this study. These samples were collected through total sampling technique, thus all population were chosen as the research participants.

The current researchers employed a face, leg, activity, cry, consolability (FLACC) scale research instrument to measure the pain because FLACC scale can be used to assess the pain felt by infants 2 months to 3 years old who still cannot define their own pain (Estiyanti, 2018).

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RESULTS

Univariate Analysis

Table 1. Frequency Distribution of Research Respondents' Characteristics based on the Age, Type of Immunization at BPM "D" Neglasari Sub-District Tangerang City, Banten 2020

Respondents' Characteristics	Warm Compress		Cold Compress	
	Amount	%	Amount	%
Age				
2 months old	1	6.7%	2	13.3%
3 months old	6	40%	6	40%
4 months old	3	20%	4	26.7%
5 months old	4	26.7%	2	13.3%
6 months old	1	6.7%	-	-
7 months old	-	-	1	6.7%
	15	100%	15	100%
Types of Immunization				
DPT – HB – Hib 1	2	13.3%	3	20%
DPT – HB – Hib 2	6	40%	7	46.7%
DPT – HB – Hib 3	7	46.7%	5	33.3%
	15	100%	15	100%

Based on table 1 above, it was found that infants who received DPT - HB - Hib immunization at BPM "D" Neglasari Sub-District, Tangerang City, Banten in 2020 were given non-pharmacological therapy including warm compress and cold compress. Warm compress therapy was given to 2 infants at the age of 2 months old (6.7%), 6 infants at the age of 3 months old (40%), 3 infants at the age of 4 months old (20%), 4 infants at the age of 5 months old (26.7%), and 1 infant at the age of 6 months old (6.7%).

Meanwhile, infants who received cold compress therapy were 2 infants (13.3%) at the age of 2 months old, 6 infants (40%) at the age of 3 months old, 4 infants (26.7%)at the age of 4 months old, 2 infants (13.3%) at the age of 5 months old, and 1 infant (6.7%) at the age of 7 months old.

Based on the types of immunization, infants who were given warm compress therapy were 2 infants (13.3%) who received DPT-HB-Hib 1 immunization , 6 infants (40%) who received DPT - HB - Hib 2 immunization, and 7 infants (46.7%)who received DPT - HB - Hib 3. Meanwhile, infants who were given cold compress therapy were 3 infants (20%) who received DPT - HB - Hib 1, 7 infants (46.7%) who received DPT - HB - Hib 2, and 5 infants (33.3%) who received DPT - HB - Hib 3

Table 2. The Average Score of FLACC Scale Before and After the Intervention DPT – HB – Hib Immunization

Variable	Mean	Min	Max
Warm Compress			
Before	1.53	1	2
After	8.00	7	9

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Cold Compress			
Before	1.47	1	2
After	3.13	2	4

Bivariate Analysis

Table 2 above shoes that before the warm compress was provided, the total score of the FLACC scale was 1.53 while after the warm compress was provided and immunization, the average total score of the FLACC scale increased to 8. Furthermore, FLACC scale score was 1.47 and after compressing and immunization the average total score of the infant FLACC scale increased to 3.13

Table 3. Wilcoxon Test of Warm and Cold Compress in Handling Pain After DPT – HB – Hib Immunization

Intervention	Mean	P *Value*
Before Warm Compress	1.53	0.001
After Warm Compress	8.00	
Before Cold Compress	1.47	0.001
After Cold Compress	3.13	

According to table 3 above, it indicates that both interventions of warm and cold compress had effects on the pain felt after DPT - HB - Hib immunization. In order to compare the two interventions, Mann Whitney test was done on the difference of FLACC scale obtained as shown in the following table 4

Table 4. Mann Whitney Test of the Effectiveness of Warm and Cold Compress in Handling Pain after DPT – HB – Hib Immunization

Variable	Difference Mean	P *Value*
Warm Compress	23.00	0.000
Cold Compress	8.00	

Based on table 4, the difference in the FLACC scale before and after intervention in infants who received DPT - HB - Hib immunization experienced a significant difference, in which the mean difference of warm compress was 23, while the mean difference of in the cold compress group was 8

DISCUSSION

Univariate Analysis

Current study discovered that the total score on the FLACC scale of infants before given warm compress was at the lowest value of 1, while the highest value was only 2 with an average value of 1.53. This indicated that before the infants received the compress, the infants felt mild pain due to the discomfort when they were put on the immunization bed. The assessment taken can be seen from the anxiety and tension so that the infants cannot stay still, which can make the FLACC scale score at the value of 1-3 (mild pain) even though no intervention was made (Estiyanti, 2018).

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However, after the infants received warm compress 15 minutes before the immunization on the infants' anterolateral thigh, it can be seen that there was an increase in the total score of FLACC scale, in which the lowest score was 7, while the highest score was 9 with an average value of 8. The FLACC scale score of 7-10 is an indication that the infants suffered from severe pain. This shown from their facial expressions and movements. The FLACC scale score in the severe pain category indicates that the infant cries continuously, tense, and cannot be calmed (Estiyanti, 2018).

The increase in the total score on the FLACC scale occurred due to the pain response felt by the infants due to the injection given. Even though they have been given a warm compress to help with pain, the infant still feels severe pain. Although the improvement shown is still significant, the effect of this warm compress can prevent swelling due to injection because warm compress can dilate blood vessels and reduce muscle tension, thereby minimizing local effects such as swelling or redness (Millati, 2015).

Based on the calculation results, the total score for the FLACC scale of infants before the cold compress was also obtained, in which the lowest value was 1 and the highest value was 2 with an average of 1.47. This shows that before the infants received the compress, they only felt mild pain due to the discomfort when they were put on immunization bed. The FLACC scale score assessment was at a value of 1-3 which is included in the mild pain category, even though there was no intervention score obtained due to the discomfort felt by the infant (Estiyanti, 2018).

Cold compress therapy was given to the infants to help reduce pain felt due to injection. Therefore by applying a cold compress to the area where the injection will be done can reduce the production of prostaglandins and narrow the surrounding blood flow. By narrowing the blood flow to the injection area, then the cold compress action as a substitute for anesthesia, the time lag between cold compress and injection should not be more than 1 minute so that the cold compress works optimally (Perry, 2014).

Based on observations in infants after cold compress and DPT-HB-Hib immunization, the total score of the FLACC scale increased from the previous one with the lowest score of 2 and the highest score of 4, so that the average total score on the FLACC scale was 3.13. The results showed that after cold compress and immunizations were carried out, the pain felt was at the mild pain category.

Bivariate Analysis

Based on statistical calculations, there was still an increase of pain felt by the infants after the immunization, although warm and cold compress were already provided. This can be seen from the Wilcoxon test with warm compress sig. of 0.001 and cold compress sig. of 0.001. The significance value obtained by both was less than 0.05, indicating that there was an effect of warm compress and cold compress between before and after the intervention (Novelia, 2020).

Based on this significance value, there was no difference between both compress, but when comparing the mean difference between before and after the intervention, as has been done with the Mann Whitney test, the results showed that the mean value of warm compress was 23, while the mean value of cold compress was 8.

Such difference is quite far, indicating the effectiveness of these therapies. Cold compress which shows a value of 8 indicates that the increase in pain between before and after the intervention is not significant, so that the mean difference is not much. Meanwhile, the increase in pain between before and after warm compress is more significant when compared to cold compress, whose mean value was 23 on warm compress, indicating that

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warm compress is less effective compared to cold compress, because the lower the mean value, the smaller the pain (Estiyanti, 2018).

The results of this study are supported by previous research conducted by Agustiningrum (2019) with the mean difference of 25.41 for the cold compress and 41.59 for the warm compress. This result indicates that cold compress before immunization are more effective than warm compress. The significance value obtained in this study was 0.001, showing that there was an effect of both interventions in reducing pain after immunization.

CONCLUSION

Based on the current research concerning the effectiveness of warm and cold compress in the management of pain after DPT - HB - Hib immunization at BPM "D", Neglasari Sub-District, Tangerang City in 2020, it can be summed up that:

The average score of FLACC scale before and after the provision of warm compress and DPT-HB-Hib immunization was 1.53 and 8.

The average score of FLACC scale before and after the provision of cold compress and DPT-HB-Hib immunization was 1.37 and 3.13.

The comparison of the effectiveness of warm compress and cold compress in pain management obtained a p-value of 0.000, which means that the interventions affected the pain. The significant differences before and after the warm compress was 23, while the difference before and after cold compress was 8

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