



The Effect of Hand Puppet Game and Cold Compress on the Reduction of Pain and Anxiety Levels in Preschool Age Children Undergoing Infusion in the Pediatric Care Room at Sumbawa Hospital

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ABSTRACT

Background: The infusion procedure was the most traumatic experience and can cause anxiety and pain for more than 50% of pediatric patients during hospitalization. This study was to determine the effect of hand puppet game and cold compress on pain and anxiety of preschool age children undergoing infusion.

Subjects and Method: This study used a quasi-experimental research design with the type of non-equivalent control group posttest-only design. It was conducted in the Pediatric Care Room at Sumbawa Hospital in July-September 2020. The total number of respondents who were hospitalized in the Pediatric Care Room at Sumbawa Hospital selected by consecutive sampling. They were divided into two, 38 people in each intervention and control group. The intervention group was given cold compress on the infusion area and the hand puppet game, while the control group was given treatment according to hospital standards. The dependent variables of the study were pain level and anxiety level, while the independent variables included hand puppet game and ice

pack (cold compress). In addition, the instruments used were pain and anxiety instruments. Data analysis was performed using the Mann-Whitney test.

Results: Based on the results of the Mann-Whitney test, there was a change of pain levels ($p < 0.001$) and anxiety levels ($p < 0.001$) after receiving hand puppet game and cold compress during infusion compared to children with normal treatment.

Conclusion: Hand puppet game and cold compress administration can be applied to reduce pain and anxiety levels in preschool age children during the infusion procedure.

Keywords: children, distraction, anxiety, pain, infusion

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Cite this as:

Daro YA, Safitri A, Sulahyuningsih E (2021). The Effect of Hand Puppet Game and Cold Compress on the Reduction of Pain and Anxiety Levels in Preschool Age Children Undergoing Infusion in the Pediatric Care Room at Sumbawa Hospital. *J Health Policy Manage.* 06(02): 148-153. <https://doi.org/10.26911/thejhpm.-2021.06.02.07>.



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BACKGROUND

Hospitalization or inpatient care is an unpleasant situation for children when they are sick and hospitalized, in which they need to adjust to the hospital environment. (Hockenberry et al., 2011).

Children who were admitted to the hospital will definitely get medication and

treatment in accordance with the disease and their basic needs, including the need for an infusion (Anson et al., 2010). Infusion was the most traumatic experience during hospitalization and can cause anxiety and pain for more than 50% of children and parents (Bergomi, 2018). The pain can have a bad effect particularly on

children since it can harm the children's development process, especially their neurological development, in which they can have a low pain threshold as adolescents or adults (Koller et al., 2012).

Furthermore, cognitive abilities in pre-school children have reached the pre-conceptual phase, which is a change in thought patterns from total egocentricity to social awareness and the ability to consider other people's points of view (Santrock, 2005). Consequently, children will react to the infusion or may avoid the needle since it causes real pain, which makes them afraid and anxious (Hockenberry et al., 2011).

This condition requires pain reduction measures prior to invasive treatment, one of which is by using non-pharmacological pain management in the form of hand puppet game and ice pack (cold compress). The combination of distraction and cold compress is very effective in reducing pain and anxiety in children under 9 years before the infusion. Both distraction and cold compress are used simultaneously to distract children's attention, while the pain is relieved by a cold compress, which can affect the A β -fiber nociceptive thereby stimulating enkephalin production; an endogenous opioid that blocks transmission of painful signals to the brain (Bergomi, 2018).

Based on the the explanation above, the researchers were interested in conducting research on the effect of hand puppet game and cold compress on the level of pain and anxiety in preschool age children who were placed in the Pediatric Care Room at Sumbawa Hospital.

SUBJECTS AND METHOD

1. Study Design

This was a quasi-experimental study with the type of non-equivalent control group

posttest-only design. It was conducted in the Pediatric Care Room at Sumbawa Hospital in July-September 2020.

2. Population and Sample

Sample consisted of 76 preschool age children (aged 3-5 years) who were hospitalized in the Pediatric Care Room at Sumbawa Hospital selected by consecutive sampling. Respondents were divided into two, 38 people in each intervention and control group.

3. Study Variables

The dependent variables were pain level and anxiety level, while the independent variables included hand puppet game and ice pack (cold compress) during infusion.

4. Operational Definition of Variables

Pain level is the level of pain felt by preschool age children due to infusion. Data were collected using Wong-Baker Faces scale instrument. Ordinal data scale Interval data scale consist of 0 no hurt, 1 hurt little bit, 2 hurts little more, 3 hurts even more, 4 hurts whole lot, and 5 hurts worst.

Anxiety level is the condition of the child crying, losing control, fear of invasive treatment, gloomy, fear of painful things. Data were collected using Child Anxiety and Pain Scale- Anxiety Only (CAPS) instrument. Interval data scale consist of 0 no anxiety, 1 mild anxiety, 2 moderate anxiety, 3 severe anxiety, and 4 panic.

Hand puppet game is an action game using hand puppet before, during, and after infusion in preschool age children. Data were collected by using observation sheets. The information consists of 0 nurse did the standard care dan 1 nurse did hand puppet game Nominal data scale

Cold compress is an act of compressing the area where the infusion will be placed (hand of preschool age children) using ice cubes/ice for 3-5 minutes. Data collection was done by using observation sheets. The information consists of 0 nurse did the

standard care dan 1 nurse did cold compress. Nominal data scale.

5. Study Instruments

Instruments used were the respondent's identity questionnaire, the pain and anxiety level assessment instruments. Pain level was assessed using Wong Baker Faces Pain Scale, while anxiety level was assessed using Child Anxiety and Pain Scale- Anxiety Only (CAPS).

6. Data analysis

The distribution of respondent characteristics was carried out by univariate statistical test. The effect of hand puppet game and cold compress on pain and anxiety was tested using Mann-Whitney Test. Shapiro

Wilk test showed the data distribution was not normal ($P < 0.05$).

7. Research Ethics

The ethical principles applied in this study included beneficence, respect for human dignity by applying informed consent, anonymity, confidentiality and justice.

This study has received ethical approval from Health Ethics Committee of University of Mataram with letter number 182/UN18.F7/ETIK/2020.

RESULTS

1. Sample Characteristics

The characteristics of the respondents are described in table 1.

Table 1. Characteristics of respondents' sample characteristics with categorical data

Characteristics	Category	Frequency	Percentage
Age	3 years	39	51.3 %
	4 years	21	27.6 %
	5 years	16	21.1 %
Sex	Male	32	42.1 %
	Female	44	57.9 %
Culture	Sumbawa	76	100 %
Previous experience	Have previous experience	19	25 %
	Does not have previous experience	57	75 %
Parental Assistance	Present	76	100 %

2. Univariate Analysis

Univariate Analysis of Pain and Anxiety Score in Children Undergoing Infusion. Table 2 showed that mean of pain score of preschool age children who were given standard care during infusion procedure

(control group) was 3.105 with median of 3 (1-5), while mean of pain score of preschool age students who were given hand puppet game and cold compress during infusion procedure (intervention group) was 2.184 with median of 2 (1-3).

Table 2. Univariate Analysis of Pain and Anxiety Score in Children Undergoing Infusion

Variable	Group	N	Mean	Median	SD	Min.	Max
Pain Score	Control	38	3.11	3	1.09	1	5
Anxiety Score	Intervention	38	2.18	2	0.69	1	3
	Control	38	2.55	3	0.76	1	4
	Intervention	38	1.92	2	0.75	1	3

The mean anxiety score of preschool age children who were given standard care during infusion procedure (control group) was 2.553 with median of 3 (1-4), while

mean of anxiety score of preschool age children who were given hand puppet game and cold compress during infusion proce-

ture (intervention group) was 1.921 with median of 2 (1-3).

3. Bivariate Analysis

Tabel 3 illustrated that there was a difference the highest pain score in the control group 5 (5.3) and intervention group 3 (34.2) the result of futher statistical analysis obtained $p < 0.001$. Meaning that there was a significant difference in mean of pain level variable between preschool age children who were given puppet game and cold compress during infusion procedure

(intervention group) and those who were given standard care.

While there was a difference in the highest score of anxiety in the control group 4 (7.9) and the intervention group 3 (23.7). The result of statistical analysis obtained $p < 0.001$, meaning that there was a significant difference in mean of anxiety level variable between preschool age children who were given puppet game and cold compress during infusion procedure (intervention group) and those who were given standard care.

Table 3. Pain and Anxiety Levels of Preschool Age Children Undergoing Infusion in the Intervention and Control Groups (an analysis by Two-sample Wilcoxon rank-sum test).

Group	Low N (%)	High N (%)	Mean	p
Pain Score				
Control	1 (10.5)	5 (5.3)	3.11	0.001
Intervention	1 (15.8)	3 (34.2)	2.18	
Anxiety Score				
Control	1 (7.6)	4 (7.9)	2.55	0.001
Intervention	1 (31.6)	3 (23.7)	1.92	

DISCUSSION

1. The effect of hand puppet game and cold compress on pain level

The results showed that there was an effect of the combination of hand puppet game and cold compress on the pain level in preschool age children who received infusion and were treated in the Pediatric Care Room at Sumbawa Hospital. Pain management by administering cold compress is a cold application that can affect the Aβ-fiber nociceptive thereby stimulating enkephalin production; an endogenous opioid that blocks transmission of painful signals to the brain (Bergomi, 2018). Several studies have shown that the use of cold compress was effective and significant. The use of cold compress was effective in reducing pain in pediatric patients during infusion (Venugopal, 2015). Additionally, the use of ice pack was more effective since it was easier and

faster to reduce pain which only takes about 3-5 minutes (Yoon, 2008).

The use of a cold compress in combination with other non-pharmacological measures such as hand puppet game was needed to have a more significant effect in reducing pain. It was proven by a study finding that hand puppet game was effective in reducing pain due to circumcision operation in children. This technique can distract children from pain (Suzan *et al.*, 2020). Several studies showed a combination of cold compress with other therapies. The combination of cold compress and vibration stimulation, a plastic containing vibration motor and battery was effective to reduce pain level in children during immunization. The intervention was well tolerated on children (Sabiner *et al.*, 2015). There was also relief pain in children

during peripheral intravenous cannulation (Canbulat et al., 2015)

Another study demonstrated that the combination of cold compress and deep breathing relaxation was effective in reducing the children pain intensity during blood drawing (Inal et al., 2017). Besides, the combinations of these therapies also reduce pain due to fistula arteriovenous puncture in hemodialysis patients. Cold compress provided an analgesic effect by means of a cold sensation mechanism that blocks the action of pain receptors on the skin (Isnaini et al., 2018).

2. The effect of hand puppet game and cold compress on anxiety level

The results showed that there was an effect of the combination of hand puppet game and cold compress on the anxiety level in preschool age children who received infusion and treated in the Child Care Room at Sumbawa Hospital. The combination of distraction, one of which was hand puppet game, and cold compresses was more effective at reducing pain, thereby reducing anxiety in children under 9 years before the infusion (Sabiner, *et al.*, 2015; Bergomi, 2018). Distraction could shift the child's focus to something more attractive so that hindered the child's ability to perceive pain stimuli. As a result, anxiety will be reduced (Koller et al., 2012).

Related study utilized hand puppet dramatic gamewasmore effective than using therapeutic play in reducing anxiety on preschool age children due to surgery. Hand puppet dramatic game helped children to learn about how to control their negative emotions such as anxiety (Dehghan *et al.*, 2017). Hand puppet game and cold compress are nonpharmacological management of pain and anxiety in preschool age children so that they can be done independently by nurses. In addition, both are affordable and do not require expensive

tools. Nurses can use this technique in providing nursing services for preschool age children in Pediatric Care Room, except in emergencies that require pharmacological measures to reduce children's pain and anxiety.

Further research in the form of multivariate research can be carried out to assess the comparison of the effectiveness of hand puppet game and cold compress on reducing pain and anxiety levels in preschool age children.

AUTHOR CONTRIBUTION

Yasinta Aloysia Daro, Alfia Safitri, Evie Sulahyuningsih, collected the data, examined the intervention, did data analysis, and wrote the paper.

CONFLICT OF INTEREST

There were no conflicts of interest of the study.

FUNDING AND SPONSORSHIP

This research received financial support or sponsorship of Beginner Lecturer Research from the Ministry of Research, Technology and Higher Education

ACKNOWLEDGEMENT

The researchers would like to extend their deepest gratitude to Sumbawa Hospital for giving permission to researchers to conduct this study.

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