GENIUS JOURNAL
general nursing science journal
e-ISSN: 2723-7729
Vol. 05 No. 02 PP. 130-138 E-ISSN 2723-7729 Prefix DOI: 10.56359/gj

Effects of Medical Material-Based Play Therapy on Pain Levels in Hospitalized Preschool Children Aged 3-6 Years

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DOI: https://doi.org/10.56359/gj.v5i2.368

ABSTRACT

Introduction: Pain is a stressor of hospitalization that, if not managed properly, can have physical and psychological impacts on children. One intervention that can be provided to reduce pain in preschool-aged children is play therapy.
Objective: This study aims to determine the effect of play therapy using medical materials on the pain levels of hospitalized preschool-aged children.
Method: This study uses a pre-experimental design with a one group pretest-posttest design approach. The number of respondents in this study was 25 preschool-aged children who were treated in the Dahlia Pediatric Ward at TK. II R. W. Mongisidi hospital Manado, selected using purposive sampling based on inclusion criteria. Pain measurement was carried out using the Wong Baker FACES Pain Rating Scale. Data analysis was performed using the Nonparametric Wilcoxon test.
Results: The Wilcoxon statistical test results showed a p-value of 0.000 ($p<0.05$), indicating a significant difference in pain levels before and after the play therapy intervention using medical equipment.
Conclusion: Based on the analysis, it can be concluded that there is an effect of play therapy using medical materials on the pain levels of hospitalized preschool-aged children. Future researchers interested in this study are encouraged to use a quasi-experimental method with a two-group pretest-posttest design.

Keywords: preschool children, hospitalization, pain, play therapy

Introduction

Hospitalization is a situation that requires children to stay in a hospital for therapy and treatment (Munandar, 2021). One of the stressors that can arise due to hospitalization in preschool children is pain (Novitasari et al., 2019). The International Association for the Study of Pain (IASP) states that pain is an unpleasant sensory and emotional experience caused by actual or potential tissue damage (Raja et al., 2020). Pain is an unavoidable side effect during childhood hospitalization; invasive procedures such as infusion and blood collection are medical actions frequently performed during the treatment process (Mardona et al., 2023).

The effects of pain as a stressor can impact children both physically and psychologically. Physically, medical procedures that induce pain can lead to increased aggression, non-cooperation, and hostility towards healthcare staff. If pain is not managed properly, it can have detrimental effects on the child, including difficulty sleeping, anxiety, helplessness, despair, and the risk of repeated intravenous insertions (Irwan, 2020; Mareta et al., 2021). Psychologically, pain-induced responses can cause stress in children, leading them to display sadness, disinterest in their surroundings, and a lack of communication (Anggraeni & Widiyanti, 2019). Research shows that 83.3% of preschool-aged children experience fear of pain, with an average of 11 pain and stress procedures per patient per day in the PICU, with an interquartile range of 5-23 (Fiteli et al., 2024; Küçük Alemdar et al., 2023).

Pain management is generally divided into two categories: pharmacological, which uses medications, and non-pharmacological, which does not use medications, such as play therapy, distraction techniques, and deep breathing relaxation (Carvalho et al., 2022; Irwan, 2020). One approach that nurses can use to reduce pain levels in preschool-aged children is to distract the child from the pain using non-pharmacological techniques such as play therapy (Oluç & Sarialioğlu, 2023). Play therapy is an intervention aimed at improving the well-being of children during hospitalization (Godino-láñez et al., 2020). Play therapy utilizing medical materials can be effective in reducing perceived pain by diverting attention and increasing the child's sense of control (Aslan & Erci, 2022). Based on a review of the literature, research in this area is still very limited for hospitalized children. Therefore, the researcher is interested in studying the effect of play therapy using medical materials on the pain levels of hospitalized preschool-aged children.

Objective

This study aims to determine the effect of play therapy utilizing medical materials on the pain levels of hospitalized preschool-aged children.

Method

This study employs a pre-experimental design with a one-group pretest-posttest approach. The research was conducted over one month at Tk. II R. W. Mongisidi Hospital in Manado. The sample for this study consisted of preschool-aged children (3-6 years old). The sampling technique used was purposive sampling based on the following inclusion criteria: 1) Preschool-aged children (3-6 years old) admitted to the Dahlia Pediatric Ward at Tk. II R. W. Mongisidi Hospital in Manado; 2) Children who, after pain measurement, exhibit moderate to severe pain; 3) Conscious and alert children; 4) Children capable of verbal or nonverbal communication; 5) Parents and children willing to participate as respondents. The exclusion

criteria for this study were: 1) Children in a weakened condition; 2) Children using respiratory assistive devices; 3) Children with neurodevelopmental disorders (e.g., ADHD, autism); 4) Postoperative children. The total sample size was 25 respondents. Pain levels were measured using the Wong-Baker FACES Pain Rating Scale. Data analysis was performed using the nonparametric Wilcoxon test.

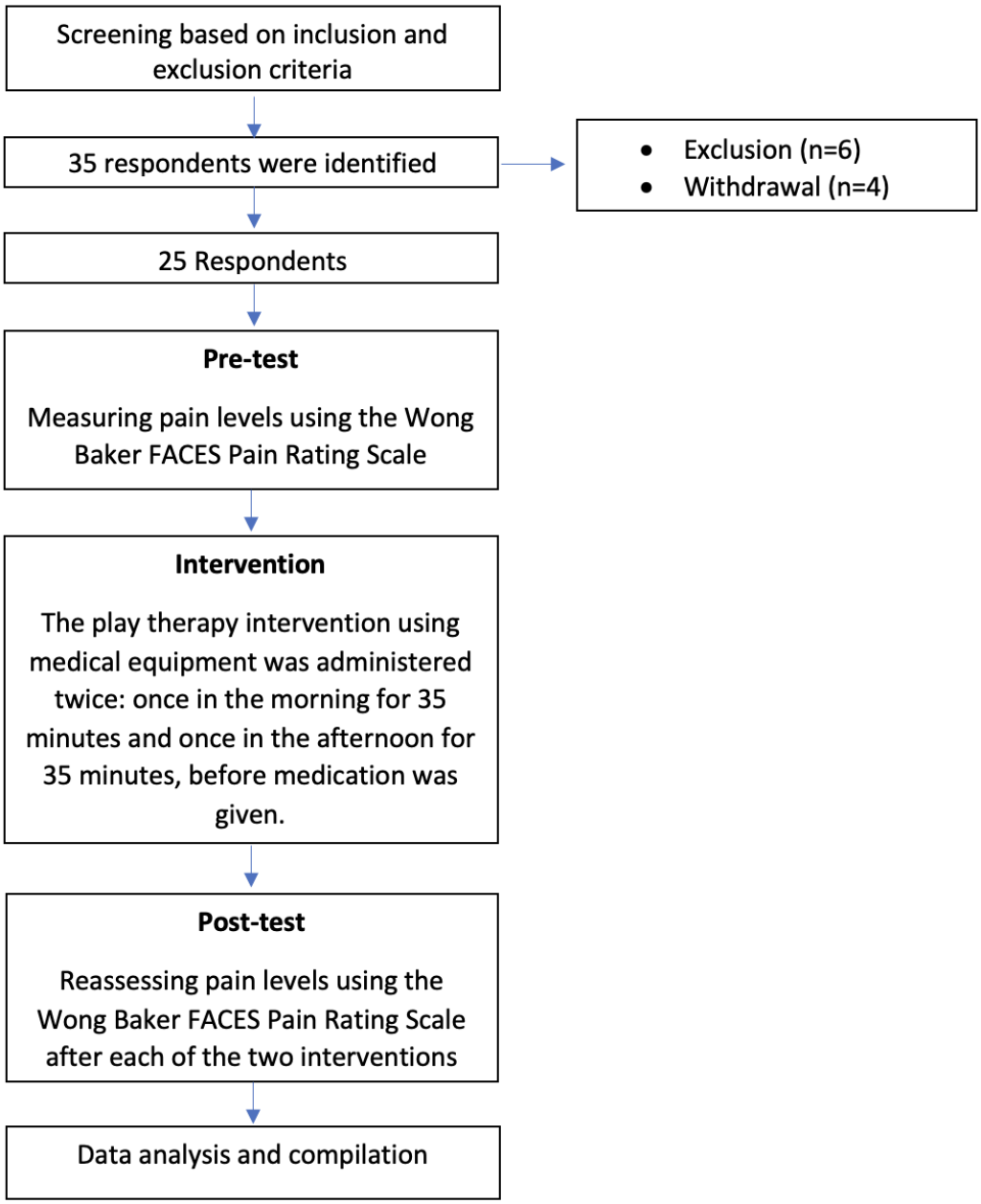

Figure 1. Research Protocol

Result

In this study, respondents were selected through an initial screening process based on predefined inclusion and exclusion criteria. As a result, a total of 25 preschool children were included as participants in the study.

Table 1. Distribution of Respondent Characteristics (n=25)

Variables	n (%)	Mean ± SD
Age		4.79 ± 1.068
Sex		
Male	11 (44.0)	
Female	14 (56.0)	
History of Hospitalization		
Experienced	20 (80.0)	
Not Experienced	5 (20.0)	
History of Invasive Procedures		
Intravenous Insertion	6 (24.0)	
Intravenous Insertion and Blood Collection	19 (76.0)	
Companient		
Mother	13 (52.0)	
Father	1 (4.0)	
Others (grandmother/grandfather)	3 (12.0)	
Mother and Father	8 (32.0)	
Diagnosis		
Dengue hemorrhagic fever	1 (4.0)	
Dyspepsia	1 (4.0)	
Acute Gastroentritis	1 (4.0)	
Acute Bakterial Infection	6 (24.0)	
Bronchopneumonia	5 (20.0)	
Obs Vomitus	1 (4.0)	
Viral Infection	10 (40.0)	
Type of Drugs		
Analgesic (paracetamol)	15 (60.0)	
Non analgesic (ranitidine, ondansentron, cefixime, ceftriaxone)	10 (40.0)	

Based on the data presented in Table 1 regarding the characteristics of respondents, the average age of the respondents is 4.79 years, with the majority (56.0%) being female. In this study, most respondents (80.0%) had previously been hospitalized, and a significant portion (76.0%) underwent infusion and blood collection procedures. Furthermore, 40.0% of the respondents were diagnosed with a viral infection, and 60.0% received analgesic medications (paracetamol). Additionally, 52.0% of the respondents were accompanied by their mothers during hospitalization.

The assessment of pain levels in preschool-aged children before and after the intervention was conducted using the Wong-Baker FACES Pain Rating Scale. This scale aids in

evaluating the intensity of pain experienced by the children by having them select faces that best represent their pain level.

Table 2. Frequency Distribution of Pain Levels Before and After Intervention (n=25)

Category	Pain Levels Before and After Intervention				Total n (%)
	No Pain n (%)	Mild Pain n (%)	Moderate Pain n (%)	Severe Pain n (%)	
Pre-test	0 (0%)	0 (0%)	11 (44.0%)	14 (56.0%)	25 (100)
Post-test	2 (8.0%)	15 (60.0%)	8 (32.0%)	0 (0%)	25 (100)

Based on table 2 above shows the results of pain levels before play therapy intervention, the majority (56.0%) showed severe pain levels. After the intervention, the majority (60.0%) of respondents showed mild pain levels.

Table 3. Effect of Play Therapy Using Medical Materials

Category	Median (Minimum-Maksimum)	p Value
Pain Levels Before Intervention	8 (4-10)	**0.000** [a*]
Pain Levels After Intervention	2 (0-6)	

[a]Analyzed using the Wilcoxon Non-parametric Test*
[*]Significant with p<0.05

Based on table 3 above, shows the results of the Wilcoxon test p value = 0.000 (p <0.05) which means statistically there is a significant difference in pain levels between before and after being given a play therapy using medical materials.

Discussion

Based on the research results, the level of pain in hospitalized preschool children before undergoing play therapy with medical materials showed that 56.0% experienced severe pain. This finding is consistent with research using the same instrument as this study, where 60.0% of hospitalized preschool children experienced severe pain during blood draws (Sayed et al., 2020). However, other studies have reported different findings, even when using the same instrument. For example, 55.0% of hospitalized children experienced moderate pain during intravenous catheter insertion (Divya & Danieal, 2021). Additionally, other research indicates that hospitalized children reported pain during both intravenous catheter insertion and blood draws (Kartika et al., 2020; Madhunandan et al., 2023).

Following the intervention, the pain level in preschool children hospitalized after undergoing play therapy with medical materials showed that 60.0% experienced mild pain. Several studies support these findings, highlighting that play therapy using medical tools

significantly reduces pain. Creating toys using medical materials can be effective in alleviating pain, as familiarizing children with these items reduces their fear. Furthermore, during play therapy, distraction and a sense of control help reduce pain (Aslan & Erci, 2022; Reid-Searl et al., 2021).

Play therapy is critical in the hospitalization process, not only because children enjoy playing but also because it facilitates healthcare professionals in carrying out procedures during recovery. Play helps children cope with situations, express emotions, manage fears and anxieties, and feel safer and more comfortable with medical procedures, thereby supporting their development and recovery (Godino-láñez et al., 2020; Hockenberry et al., 2019). Medical play has a strong relationship with emotional control. While some research suggests that music therapy may be more effective than medical play therapy, studies show that both approaches are highly beneficial for children. Playing with medical tools provides insights into children's understanding of healthcare experiences and enhances their ability to overcome fears of medical procedures (Kencana et al., 2023).

Play therapy is a distraction technique used to minimize pain, alongside medication, by diverting attention away from the painful stimulus (Hockenberry et al., 2017). Distraction techniques can activate the limbic system, a group of brain structures located near the lateral thalamus, beneath the cerebral cortex, and above the brainstem. This system inhibits the transmission of pain impulses from the thalamus to cortical structures (Anggraeni & Widiyanti, 2019). Physiologically, distraction reduces pain by stimulating the brain to release endorphins, which act as natural painkillers produced by the body (Potter & Perry, 2020).

In this study, the play therapy intervention was conducted twice daily, once in the morning and once in the afternoon. Before initiating the first play therapy session, the researcher assessed the pain levels of all hospitalized preschool children by asking them to point to a picture that best represented their current pain. The children displayed varied responses during this process. Some were confused or frightened, with a few crying when the researcher first entered the room, while others were reluctant to look at the provided pictures. However, some children immediately indicated the picture that matched their pain level, prompting the researcher to seek help from accompanying parents or family members. Based on the screening results, children who experienced moderate to severe pain and met the other inclusion criteria were selected for the play therapy intervention.

The intervention lasted 35 minutes and used medical materials such as gloves, syringes, and adhesive tape. These medical tools were creatively transformed into toys: gloves were made into balloons, and syringes and adhesive tape were used to create a toy airplane. During the sessions, the researcher engaged the children in conversation. During the first session, some respondents remained disinterested, with flat expressions and hesitation to touch the play tools like gloves and syringes, while others responded positively and appeared pleased.

The second intervention took place in the afternoon, following the same process as the first and lasting 35 minutes. During this session, the majority of respondents displayed more positive attitudes, evidenced by smiles, laughter, and increased cooperation. Some children became brave enough to move their hands, even with intravenous lines in place, and began interacting with the medical materials used in the play therapy. After this second session, the researcher reassessed the children's pain levels by asking them to select the picture that represented their pain after the play therapy.

In conclusion, play therapy using medical materials proved effective in reducing pain levels in children. This therapy is simple for nurses to administer and requires minimal cost, as the tools used—such as gloves, syringes, and adhesive tape—are readily available in hospitals. Play therapy with medical materials can serve as a valuable strategy for alleviating pain in hospitalized children (Reid-Searl et al., 2021). Offering this type of therapy is a practical and cost-effective intervention for reducing pain levels in preschool-aged children (3-6 years) undergoing hospitalization.

Conclusion

Based on the research conducted, it can be concluded that there is an effect of play therapy using medical materials on the pain levels of preschool-aged children (3-6 years) who are hospitalized at Tk. II. R. W. Mongisidi hospital Manado. Recommendations for future researchers can use quasi-experimental methods with a two group pretest-posttest approach.

Conflict of interest

The researchers stated that there is no conflict of interest related to the implementation and publication of the results of this research. The entire research process, from planning, data collection, analysis, to report preparation, was carried out independently without any influence or pressure from any third party. A commitment to research ethics is upheld throughout the research process, ensuring transparency, accuracy and honesty in reporting results. Respondents' participation was voluntary with informed consent, and their confidentiality and privacy were maintained in accordance with applicable research ethics standards. With this statement, researchers hope that the research results can be trusted and used as a valid reference for the development of science and health practices related to ethnomedicine and reproductive health.

Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Ethical consideration

This research has passed the ethical test from KEPPK STIK Sin Corolus with ethical number 103/KEPPKSTIKSC/VII/2024.

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