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The Effect of an Animation Video on Pain Response of 3-6 Years Old during Injection Intravenous

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ABSTRACT

Animated videos are one of the easiest ways to play when the child receives a medicine injection via an intravenous catheter that might reduce pain response. This study aimed to determine the effect of animation video on pain response for 3-6 years old during injection medicine via intravenous catheters. The study employed a quasi-experimental pre-test - post-test design. The intervention group (n: 107) was provided with an animation video during intravenous therapy, and the control group (n: 106) received standard care. FLACC (r: 0.845) was used to measure behavioural pain response, while heart rate was used to assess physiological pain response. Animation video with content validity index (Aiken's V: 0.86). There were statistically significant differences in pain response, behavioral pain response, and physiological pain response between the intervention group and the control group. Animation video intervention can be used to reduce procedural pain during injection medicine intravenous therapy.

1. Introduction

Approximately 30% of children are admitted to the hospital at least once during their childhood [1]. "The Effect of Storytelling on Anxiety and Behavioral Disorders in Children Undergoing Surgery: A Randomized Controlled Trial</P>.". Hospitalization requires patients to get medical interventions that make patients uncomfortable, especially children. For hospitalized patients, peripheral intravenous catheters (PIVCs) are the most extensively utilized intravenous therapy equipment [2]. PIVCs are given to about 80% of inpatients for injecting fluid, medicine, and other reasons [3]. During needle interventions in hospitals, children frequently feel severe pain [4]. Pain is a common occurrence in children that are impacted by environmental, sociocultural, and individual factors, causing fear, anxiety, and depression [5]. Pain is an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage (3). Currently, play intervention in hospitals has long been used to help children prepare for invasive medical interventions and inpatient treatment [6]. Play is important throughout the hospitalization period, not only because children enjoy playing, but also because it allows health professionals to intervene more easily [7]. The pain tolerance of the child is increased with this technique, which includes distracting the youngster's attention away from the procedure with stimulating stimuli [8]. Children's pain and fear are reduced when they watch a cartoon [9], [10]. This study aimed to determine the

effect of animation video on pain response for 3-6 years old during injection medicine via intravenous catheters.

2. MATERIALS AND METHODS

The research method was a cross-sectional study of elderly aged 60 years and over, living in communities and nursing homes, in February-November 2019. Subjects living in the community recruited during outpatient admission on the hospital for mild musculoskeletal or mild chronic diseases, while some subjects living in nursery home.

Inclusion criteria were able to walk without assistive devices, able to grip, and willing to be examined for physical function, Hb, and FBG. While the exclusion criteria were subjects who had neurological dysfunction (exp; post-stroke, Parkinson's), and had severe musculoskeletal dysfunction on the lower extremities (exp; post fractures, dislocations, severe arthritis).

Sarcopenia assessment by examination of SMI, HG, and GS. Assessment of SMI using a Body Impedance Analyzer (BIA) *BC-601F FitScan Segmental Body Composition Monitor Spanis*h, with a value in units of Kg/M2. Evaluation of HG using a Jamar dynamometer by squeezing the hand grip by fingers, the value determine according to the indicator needle on numbers in Kg. While, the GS assessed by evaluation of walking duration in meter/second on 6 meters walking track. Laboratory test in standardized laboratory in research hospital. Examination of Hb by conversion to cyamethemoglobin with adding ferricyanide and potassium cyanide. While measurement of FBG levels after fasting for 8 hours, on blood vein examination by dry reagent in quantitative unit.

This research passed the ethical review of the ethics committee of the Faculty of Medicine, Trisakti University number of128/KER/FK/III/2018.

3. FINDINGS AND DISCUSSION

3.1 Characteristics of the participants

Children who had been admitted to the hospital were the subjects of this study. The study included 213 participants who were divided into two groups: intervention and control. The intervention group included a total sample of 107 people, with 64 (59.8%) boys and 43 (40.2%) girls, while the control group had a total sample of 106 people, with 66 (62.3%) boys and 40 (37.7%) girls.

3.2 Behavioral pain response

The Kolmogorov-Smirnov test was used to determine the normal distribution of data, which was significant for pre-test and post-test scores of < 0.001 ($p < 0,05$) on behavioural pain response when receiving medicine injections through an IV catheter before and after the intervention animations video in the intervention group, as confirmed by the Q-Q plot results (Figure 1). As a result, nonparametric tests were used to conduct the analysis. There is a substantial difference between the two stages, according to the Wilcoxon test. 71 samples have a negative score, indicating that after receiving animation video intervention, their pain levels decreased. Meanwhile, 36 of the samples remained unchanged (Table 1).

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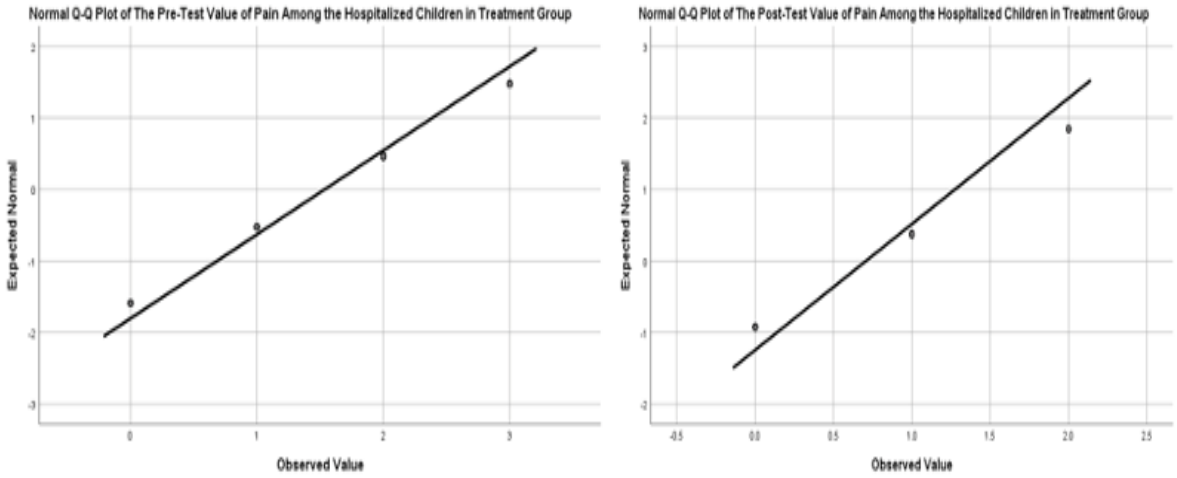

Figure 1 Q-Q plots of the pre-test and post-test of behavioral pain response

Table 1. The comparison of Pre-test-Post-test in the intervention group (n: 107)

Pre-test - post-test		Mean Rank	Sum of Ranks
Z	-7.722		
Asymp.Sig. (2-tailed)	0.000		
Negative Rank	71	36.00	2556.00
Positif Rank	0	.00	0.00
Ties	36		

Test: Wilcoxon Signed Ranks Test

The data was not normally distributed, and the Levene test revealed that the variance was not equal, thus the Mann-Whitney test was employed to compare post-test data on behavioural pain response when receiving medicine injections through an IV catheter between the intervention and control groups. The hypothesis is accepted in the Mann-Whitney Test if the value of a Symp. sig. (2-tailed) is less than 0.05, indicating a significant difference between the two stages. The Z value, on the other hand, indicates how much has changed between the two stages. The Z value is -9.444, and the (2-tailed) sig. value is < 0.001. (Table 2). As a result, the behavioural pain of the children admitted to the hospital in the intervention group and the control group was significantly different. A negative Z score shows that the pain response has decreased as a result of the watching animation video intervention.

Table 2. The comparison of Post-test in intervention and control group (n: 107:106)

	Sig.	Levene stat.	Post-test value between groups
Kolmogorov-Smirnov			
Intervention Group	0.000		
Control Group	0.000		
Homogeneity of Variance			
Based on Mean	0.000	1.808	
Based on Median	0.000	0,681	
Z			-9.444
Asymp. Sig. (2-tailed)			0.000

Test: Mann-Whitney test

3.3 Physiological pain response

ANCOVA was performed by controlling post-intervention heart rate to verify the effect of the intervention and it was found that there was a statistically significant difference in post-test heart rate between the intervention group and the control group (F = 81.185, P = 0.000) Table 3.

Table 3. ANCOVA was used to control for heart rate in the post-test heart rate analysis.

Source	df	M^2	F	*P*
Corrected model	1	179491,927	81,185	,000
Intercept	1	3,956	,002	,966
Group	1	179491,927	81,185	,000
Error	211	2210,901		
Total	213			
Corrected Total	212			

3.4 DISCUSSION

The normality test yielded non-parametric data, the Wilcoxon test was used to examine changes in behavior pain reactions in children getting pharmaceutical injections through an IV catheter while hospitalized before and after watching an animated video [11]. The FLACC instrument, which may be used at ages 2 months to 7 years, was utilized to measure the behavior pain responses [12], [13]. Pain is influenced by a child's past experiences and is dependent on existing tissue damage, which may or may not be visible. Pain associated with medical procedures and treatments is typically viewed by children as one of the worst elements of long-term disease [14], particularly regarding needle procedures [15].

Based on table 1, there is a significant difference between before and after the intervention of watching an animation video (Z:-7.722, p: 0.000 <0.05); a negative Z value indicates that the intervention reduced behavior pain response. The Wilcoxon test revealed that 71 of 107 respondents reported a decrease in pain after receiving the intervention of watching an animation video, whereas 36 respondents reported no changes in behavioral pain responses. The sig.2 tailed result of the Mann-Whitney test (Table 2) is 0.000 < 0.05, indicating that there is a significant difference in pain levels between the intervention and control groups of children who are given medication injections. The treatment of watching animated movies reduces the behavioral pain response, according to a negative Z score. These findings support prior research that has shown that social robots reduce children's pain and anxiety in medical environments [4]. The rotating wooden toy and toy wristband minimize procedural pain, fear, and anxiety in children during venous blood sampling [5]. During an intravenous insertion intervention, children's perceived pain was reduced by watching a cartoon [10]. Patients undergoing invasive procedures reported less pain after watching the cartoon. The gate theory, which states that neurons that respond to sensory inputs are larger and respond faster than neurons that respond to pain, could explain this pain reduction. When sensory neurons are stimulated, the "gates" are closed, blocking pain neurons from firing [16]. Distraction and focusing of attention on things that children enjoy are also possible explanations for the impact of watching animated videos on children's pain perception. So it can be concluded that watching animated videos can reduce the response to pain scores.

According to table 3, the Corrected Model sig. is < 0.001 and the F value is 81,185, suggesting that the covariate variable and the dependent variable have a relationship, such that when behavior pain response increases, so do heart rate. Children commonly experience high levels of discomfort and fear during needle procedures in hospitals, as well as physiologic responses such as elevated heart rate, temperature, perspiration, and respiratory responses [4], [17]. Children's pain and the suffering that comes with it during medical procedures may affect their memories, increasing their discomfort and anxiety in the future [15]. If a child's pain isn't managed quickly and effectively, it might have long-term physical and psychological

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consequences [8]. Effective pain therapies could improve the health of children and shorten their hospital stays. In addition, the overall cost of treatment could be reduced. Pain management is an important concern for healthcare providers because of these benefits [18], [19].

4. Conclusion

The use of a free to download video animation intervention that has been validated by an expert is effective in reducing pain response in preschool children during intravenous medication injection. Animated videos can be an excellent nursing intervention for use in a clinical setting because they take low effort and time, as well as being cost-effective and handy.

5. References

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