Effect of Animated Stories on Pain Intensity and Physiological Parameters among Post-Operative Children

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Abstract

Background: Children who are undergoing surgical procedures experience pain. **Animated stories** are a non-invasive, inexpensive, and non-pharmacological nursing intervention that has no side effects and can be effective when provided alongside routine care and on physiological parameters in the surgical ward among post-operative children**. This study aimed to** investigate the effect of animated stories on pain intensity and physiological parameters among post-operative children. **Design**: Quasi-experimental research design was utilized in the current study. **Subjects**: The study included a purposive sample of 100 children from 5- 10 years who were equally divided into two groups, the first was the control group and the second was the experimental group. **Setting**: This study was carried out in Surgical Pediatric Ward at Sohag University Hospital. **Tools**: (I) An Interview Structured Questionnaire was developed by the researchers, (II) Wong-Baker FACES Pain Rating Scale,and (III) physiological parameters assessment tool was utilized for collecting the data. **Results**: There was a highly statistically significant difference detected between the total mean score of the postoperative intensity of pain among post-operative children on WBFS between the experimental and the control groups (P=0.001). There was a marked reduction in the mean score of pain and diastolic blood pressure (SBP & DBP), heart rate, and respiratory rate in the experimental group as compared to the control group. There was a significant difference between the mean score of pain, SBP, DBP, heart rate, and respiratory rate in both groups after the experiment. **Conclusion**: Animated stories were found to be more effective in reducing pain, diastolic blood pressure, and heart rate among post-operative children in the experimental group than those in the control group who received only routine hospital care. **Recommendations:** Thus, it is essential to include animated stories as a tool in postoperative care as non-pharmacological management for pain relief.

Keywords: Animated stories, Children, Post-operative Pain, Physiological parameters.

Introduction

Children who undergo surgery experience pain, which negatively affects their physical and psychological well-being and raises their pain threshold after surgery. Pain-affected children are more prone to object to and reject pre-and post-operative care. Therefore, one of the most important nursing duties is to lessen the suffering of the child **(Sola et al., 2017)**.

One of the most common health issues in kids is pain, which is thought to be the body's primary line of defense when abnormal physiological conditions cause it. Numerous age-specific pain treatment tools and ratings have been developed since it can be challenging to evaluate children's pain **(Srouji and Ratnapalan, 2017).** Pain in children is frequently brought on by surgical procedures. Numerous children also feel discomfort during venipuncture treatments, which can worsen a child's impression of pain and make for a negative experience. Relieving suffering and pain is a crucial duty of nurses caring for children because the pain has certain long-term detrimental effects **(Kennedy et al., 2018).**

Pain is an unpleasant sensory and emotional experience that accompanies tissue damage and children may undergo painful healthcare procedures, such as venipuncture. Pain-relieving methods are generally classified as pharmacological and non-pharmacological. Nurses often use nonpharmacological pain management methods because they are easy to implement, inexpensive, and have no side effects **(Tercan and Sarıtaş 2017**). In the immediate postoperative period, most of the children were suffering severe pain and it makes a negative impact on children's recovery during the post-operative period. The pain without proper treatment may lead to adverse hemodynamic consequences like tachycardia, arrhythmias, and hypertension; it also can lead to sleep, mode, and behavioral changes. All of these consequences of pain results are increased hospital stay, readmission, and prolonged recovery and negatively affect the quality of life **(Elmistekawy E, Attia, 2020).**

By passively refocusing the subject's attention or including the subject in a diverting activity, audio-visual distraction, such as animated storytelling, is an easy strategy that nurses can use to combat the issue of lack of attention to pain management (**Hatipoglu et al., 2018**). Animated storytelling has the power to arouse emotions and break the link between a person and their emotional suffering by drawing attention away from one's suffering and onto compassion for others, happier thoughts, and other distracting sensations (**Hassan, 2015).**

Before surgery, it has been asserted that animated storytelling can reduce discomfort. Children enjoy hearing stories read aloud to them. Stories can help people feel motivated and enjoy themselves. Children who are through preoperative anxiety and fear will benefit from distraction therapies including watching cartoons, engaging in therapeutic games or hobbies, or listening to age-appropriate stories or music **(Goncalves et al., 2017).**

Animated stories can be used in conjunction with other interventions to help children who are experiencing symptoms like pain. Numerous studies have demonstrated that animated storytelling can help children with a variety of ailments, including pain and relaxation. The use of animated storytelling therapy is supported by research that shows it to be widely accessible, economical, low risk, and not require extensive staff training. Nursing personnel become more appreciative of evidence-based practice, which may lessen the requirement for mild sedation and enhance the overall patient experience **(Hendra. et al., 2019).**

Because 87% of the animated stories therapy participants reported that animated stories help in reducing pain during painful procedures. Many studies report that animated stories are healthy for the mind to relax by hearing slower animated stories. Animated stories directly affect brain waves. It reduces pain and lowers blood pressure **(Williams, 2021)**

Animated stories also increase relaxation by reducing the release of stress hormones and weakening arousal of the pituitary-adrenal stress axis. Reduction of the stress hormones by animated stories was done by the down-regulation of hypothalamic-pituitary-adrenal axis activity, which can be seen in the reduction of serum concentrations of cortisol. The brain has a nice correlation with music-evoked emotions. animated stories also have an impact on the down-regulation of autonomic nervous system activity which results in lowering both blood pressure and heart rate (**Al Sutari et al., 2019).**

Following surgery, blood cortisol levels, a marker of the stress response, were measured along with vital signs and pain ratings. In the intervention group, animated stories had a positive impact on lowering pain scores and respiratory rates. For children undergoing surgery, Bojorquez et al. conducted research to determine the best method of pain management employing therapy using animated stories **(Bojorquez et al., 2020).**

Nurses need to be aware of the anguish and pain that children experience after surgery. To support children, nurses must understand what suffering is and how children express it. In addition to articulating their worries in great detail, children might express their anxiety in a variety of ways, such as by withdrawing or speaking little. Nurses should reduce a child's discomfort not only because untreated pain can be dangerous, but also because doing so can result in earlier mobilization, cheaper costs, and shorter hospital stays **(Aydin, et al., 2019).**

Significance of the study:

Children who are in severe pain find surgical treatments to be among the most terrifying procedures. Taking care of children's discomfort is not only morally required, but it also helps to prevent both immediate and long-term consequences. Children may forego future medical care due to unpleasant experiences at a hospital or clinic. Many young patients who are having surgery feel pain throughout their hospital stay, which can seriously hinder their development. Reduced discomfort during surgery for children might be viewed in the child's health to reduce long-term harmful effects **(Hosseinpour and Ahmadi, 2016)**.

There was a significant difference in the mean score reduction in both pains among the patients who got the animated storytelling intervention. There was a clinically significant decrease in pain. Many pain centers and cancer facilities offer animated stories as a way to comfort, enthuse, energize, and uplift those who are experiencing chronic pain. A limited number of research have been conducted to determine the impact of animated stories on post-operative children's pain and physiological parameters utilizing Western and classical animated stories because of their cultural implications **(King Lindley, 2022).**

Aminabadi et al. (2019) demonstrate that animation storytelling had a positive impact on lowering pain in children visiting the dentist, and **Chow et al. (2015)** demonstrated that audiovisual therapies helped reduce postoperative pain in children. The effectiveness of animated storytelling as a diversion strategy for kids having surgery is a topic that has received little research. The use of animated storytelling as an intervention to improve patient comfort is widely accepted. Even though much earlier research has found beneficial results, it has not been tried in this study's context to use animated stories as an intervention to lessen children's pain. Therefore, the current study aimed to investigate the effect of animated stories on pain intensity and physiological parameters among post-operative children.

Operational definitions:

Animated Story: Since the human eye can only hold an image for around a second at a time, this technique involves capturing multiple sketches, models, or even puppets to provide the appearance of movement in a sequence. The number of consecutive images that are displayed per second, or frame rate, is taken into account to give these drawn, painted, or computer-generated images the appearance of fluid motion. To show one image for two frames, or a total of 12 drawings per second, moving characters are typically photographed "on twos." Motion can be seen at 12 frames per second, however, it can look choppy. For smooth motion, the movie frequently uses a frame rate of 24 frames per second.

Physiological parameters: physiological measurements such as blood pressure, temperature, pulse, and respiration.

Aim of the study:

This study aimed to investigate the effect of animated stories on pain intensity and physiological parameters among post-operative children through:

- Assessing pain level among children.
- Assessing physiological parameters among children.
- Determining the effect of animated stories on

pain intensity and physiological parameters among post-operative children.

Research hypothesis:

Children who will receive animated storieswere expected to experience low levels of pain intensity and improved physiological parameters than those not receive animated stories.

Materials and method:

Research design:

The goal of this study was accomplished using a quasi-experimental design. An empirical interventional study using a quasi-experimental design does not use randomization to determine the causal effects of an intervention on the target population **(Middleton, 2019).**

Setting:

This study was carried out in Surgical Pediatric Ward at Sohag University Hospital. This setting is present on the third floor of Sohag University Hospital. The first room had five beds, while the second room had six beds. There were two rooms in all. The previous location was chosen because it is one of Egypt's largest public hospitals and has a high frequency of youngsters seeking medical care from all over the country who are from different socioeconomic and educational backgrounds.

Subjects:

100 children aged between five and ten years were involved in the study as a purposive sample. They were equally divided into two groups: the experimental group, which included 50 children, and the control group, which included 50 children.

Sample size:

Based on a power analysis of 0.95(=1-0.95=0.5) at alpha, the sample size was determined. The significance level was set at 0.05 (one-sided), with a big effect size of (0.5), and the level of strong significance was set at 0.001.

Sampling technique:

Data was gathered using a technique known as purposive sampling.

Sampling randomization:

The children were chosen using a simple random sample method. Each child was asked to choose a piece of paper, which was how randomization was done. The child who chose the letter carrying the paper (E) was in the experimental group, and the patient who chose the letter containing the control paper (C) was in the control group. While the control group received standard treatment, the experimental group, which included children of both sexes and agreed to participate in the study, received animated stories in addition to routine care.

Inclusion criteria included:

(1) The study included children aged 5 to 10 years.
(2) Male and female children.
(3) Children who were present during the study.

Exclusion criteria included:

(1) Children suffering from chronic and mental health issues.

(2) Children had severe hearing or vision impairment

Tools of data collection:

Tool (I): An Interview Structured Questionnaire: it was developed by the researchers after reviewing the related literature **(Aminabadi et al., 2019 and King Lindley, 2022)**; it consisted of two parts:

Part I: Demographic characteristics of the child as age and sex.

Part II: Clinical data included information about the child's diagnosis and previous hospitalization.

Tool (II): Wong-Baker FACES Pain Rating Scale: It was used to evaluate the effectiveness of animated storytelling in eliciting pain responses in youngsters. It has a total score of 10 and is composed of 6 points.

It was used to demonstrate how youngsters perceive pain. The scale displays a succession of faces ranging from a cheerful face at 0 ("No Hurt") to a crying face at 10 ("Hurts Worst"), with a maximum score of 10 and a minimum score of 0, with the highest score of 10 and the minimum score of 0 categorized as 0 - No Hurts, 10 - Hurts Worst, and 1 - Hurts Worst. 2 - Hurts a little, 4 - Hurts a little more, 6 - Hurts even more, and 8 - Hurts a lot **(Wong and Baker, 1988).**

Tool III: Physiological parameters' assessmenttool:

This instrument was used to collect data relevant to analyzing the physiological parameters of the children investigated, such as temperature, pulse, respiration, and blood pressure.

Procedure:

Preparatory phase:

It includes evaluating related literature and theoretical understanding of many parts of the study using books, journals, the internet, periodicals, and magazines to design data-gathering instruments. This also aided in the development of testing tools.

Tool development:

The researchers create these study tools by reviewing local and international linked literature related to the research issue using books, evidence-based papers, periodicals, and magazines of line reference.

Tools validity:

The content validity of the tools was evaluated by a group of five professor experts, three professor experts in pediatric nursing, and two professor experts in pediatric medicine, all of whom have more than ten years of experience in the field. Based on the panel's assessment of item sequencing, appropriateness of content, sentence clarity, and accuracy of scoring and recording, no changes were made to the tools.

Tools Reliability:

Alpha Cronbach's test, the first tool used to measure tool reliability, yielded a value of (0.89, 0), indicating the tool's high dependability. With those on a visual evaluation scale, the Wong-Baker FACES Pain Rating Scale and the WBS had a strong correlation (Spearman's rho > 0.80) (VAS) **(Garra, et al., 2010).**

Pilot study:

A pilot study was conducted on 10% of the sample (10 children) to assess the feasibility of the research study, test the tools' usability and clarity, and determine how long it would take to gather the data. The tools were left unchanged in the finished version. Children who took part in the pilot were covered by the investigation.

Administrative and ethical considerations:

Before beginning this study, administrative consent was secured from the directors of the selected setting. The mothers of the children were initially introduced to the researchers, who then described the purpose of the study and assured the mothers about all data gathered would be kept confidential. The researchers conducted interviews with the kids and provided them with a detailed explanation of each tool after getting their oral consent for data collection.

Informed consent was obtained after mothers and their children were informed of the goal of the study. The study's participants were informed that taking part was entirely voluntary, that they may withdraw at any time, and that they could opt out at any time. Additionally, they were informed that their data would be kept private and used only for research.

Fieldwork:

- The fieldwork itself began in July 2023 and was completed in October 2023. The interview was conducted over two weekdays from 9 a.m. to 12 p.m. Each participant spent about 25 to 30 minutes to finish the

questionnaire. The researchers employed Tools II and III as pre-and post-intervention.

The assessment phase, implementation phase, and evaluation phase were the three stages of the study's implementation.

I- Assessment phase:

Before gathering data, the researchers introduced themselves to the kids and went on to explain the purpose of the study and the expected results. The researchers evaluated the children's clinical and demographic data. The researchers pretested the physiological parameters of the kids and recorded them. Pretest versions of the data collection tools (tools II and III) were employed. Before the intervention, the researcher used pre-testing methods to evaluate the physiological parameters and pain levels of post-operative children in both groups.

II- Implementation phase:

Before the surgery, the children received standard care such as fasting time, hygiene, physical exam, and vital signs monitoring. The intervention of animated stories was also acknowledged. Along with the usual management, this intervention was administered from the first to the third postoperative day. The regular post-operative care was given to every patient in both groups by the protocol created by the surgeon and nurses.

Animated stories featuring moving images or brief films and vibrant, eye-catching graphics were a part of the first phase. A discussion of the animated tales with the youngster is a part of the second stage of the procedure. On the day of surgery, the Pain Rating Scale was employed to determine whether the animated stories' impact on children's postoperative pain levels was beneficial. The first day's physiological measurements, including temperature, pulse, respiration, and blood pressure, were taken every two hours for each infant until the third day.

When the animated stories started to play, the researcher was present in the space. To measure visual attention while listening to the stories, the animated stories were shown for roughly 15 minutes on an eye-screen tracker. In the current study, there were two stages to the data collection process: evaluation of physiological variables (before and after intervention). Pre- and post-intervention pain levels are evaluated following surgery.

In the control group:

The control group's children received only regular care in the surgical pediatric unit and were evaluated using the same methods as before.

III- Evaluation phase:

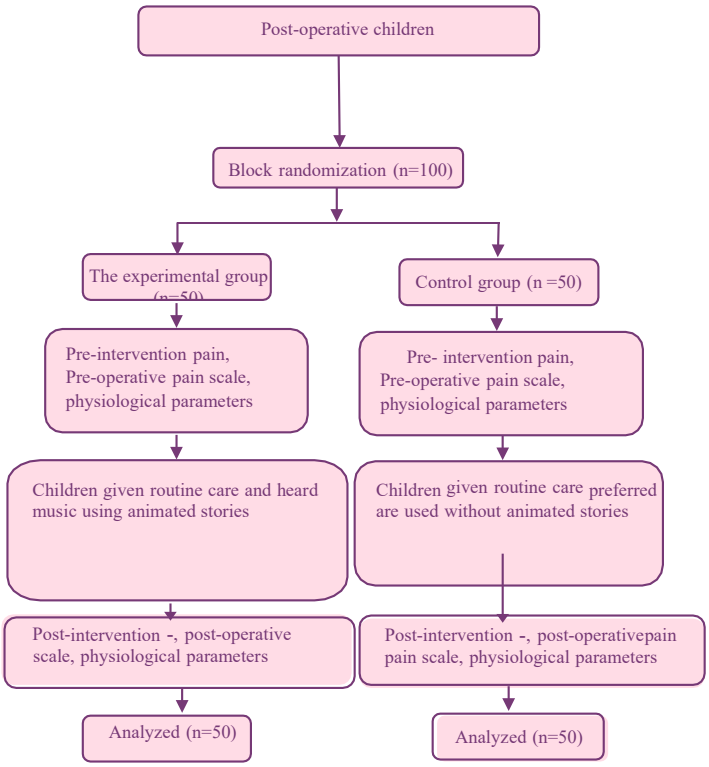
After implementing the study using animated stories, the children's pain and physiological parameters were assessed on the day of surgery using the same pre-test techniques (tools II and III).

Statistical analysis:

SPSS version 19 (Statistical Package for Social Science) was used for data entry and analysis. The data was presented in the following formats: number, percentage, mean, median, and standard deviation. To compare qualitative variables, the Chi-square and Fisher exact tests were used. To compare quantitative factors between two groups, the Mann-Whitney test was utilized When $P < 0.05$, the P-value is considered statistically significant.

Results:

Table 1 showed that, with MSD values of 5.44± 4.32 and 5.66± 4.54, respectively, the age range of the experimental group's children (54%) and the control group's children (58%) was between 7 and 10 years old. High numbers of boys (56% in the experimental group and 54% in the control group, respectively) were found in both groups. Demographic differences between the experimental group and the control group were not statistically significant.



According to **Table 2**, 50% of the children in the experimental group underwent tonsillectomy and adenectomy, followed by 40% of those exposed to different types of accidents, whereas 46.0% of the children in the control group underwent tonsillectomy and adenectomy, followed by 38.0% of those exposed to different types of accidents. Both the experimental group and the control group of the study's youngsters had no prior hospitalization history (80% and 82%, respectively).

According to **Table 3,** 34% of the control group's study participants had pain at a Hurts Worst level before the intervention, but only 50% of those in the pretest experimental group did. Additionally, there was a statistically significant difference in pain intensity between the experimental group and the control group (P <0.001).

Table (4): shows that there was a statistically highly significant high mean difference value in the study group between the pre-intervention and post-intervention with a reduced mean difference between the pre-intervention and post-intervention of the pain intensity.

Table 5 shows in the experimental group, there were significance changes in the physiological parameters with the mean difference value of systolic blood pressure was 15.22, diastolic blood pressure being 10.78, heart rate being 19.67, and respiratory rate being 7.85 with a statistical significant with a control group with the lower mean differences than the experimental group respectively.

Table (1): The studied children distribution in experimental and control groups regarding their demographic data

Demographic data	Experimental group (n= 50)		Control group(n= 50)		P-value
	No	%	No	%	
Age in years					
5 - < 7	23	46	21	42	0.524
7 - ≤ 10	27	54	29	58	
Mean ± SD	5.44 ± 4.32		5.66 ± 4.54		0.337
Gender:					
Boys	28	56	27	54	0.653
Girls	22	44	23	46	

Table (2): The studied children distribution in experimental and control groupsregarding their clinical data

Clinical data	Experimental group (n= 50)		Control group(n= 50)		P-value
	No	%	No	%	
Medical diagnosis					
Tonsillectomy & Adenectomy	25	50	23	46	0.996
Accident	20	40	19	38	
Hernia	3	6	6	12	
Intestinal Obstruction	1	2	1	2	
Others	1	2	1	2	
Previous hospitalization					
Yes	10	20	9	18	0.987
No	40	80	41	82	

Table (3): Differences between the intensity of pain among children in experimental and control groups pre and post-intervention

The intensity of Pain on WBFS	Experimental group (n= 50)				Control group(n=50)				p-value
	Pre		Post		Pre		Post		
	No	%	No	%	No	%	No	%	
No hurt	0	0.0	0	0.0	0	0.0	0	0.0	0.001*
Hurts Little Bit	0	0.0	19	38	2	4	5	10	
Hurts Little More	10	20	10	20	5	10	9	18	
Hurts Even More	5	10	13	26	6	12	10	20	
Hurts Whole Lot	10	20	10	10	11	22	9	18	
Hurts Worst	25	50	3	6	26	52	17	34	

P<0.001, highly statistically significant

Table (4): Comparison between postoperative pain mean scores and standard deviation among children in experimental and control groups pre and post- intervention

Assessment	Mean (SD)	*P* value
Study group (n = 50)		
Pre-intervention	8.68 (0.95)	
		0.001*
Post-intervention	2.86 (1.03)	
Control group (n = 50)		
Pre-intervention	8.44 (1.27)	
		0.789
Post-intervention	8.56 (1.36)	

[a] Paired t-test, * Statistically significant.

Table (5): Comparison between postoperative physiological parameters among children in experimental and control groups pre and post-intervention

Physiological parameters	Experimental group			Control group		
	Mean (SD)		*P* value	Mean (SD)		*P* value
	Pre-intervention	Post-intervention		Pre-intervention	Post-intervention	
Systolic blood pressure (mm Hg)	138.7(10.16)	123.6 (7.19)	0.001*	133.9 (8.11)	125.5 (6.33)	0.001*
Diastolic blood pressure (mm Hg)	91.22(6.55)	81.33 (5.77)	0.001*	92.66 (8.33)	89.71 (7.37)	0.001*
Heart rate (beats/min)	102.3(13.22)	83 (9.88)	0.001*	101.4 (13.22)	97.55 (12.13)	0.001*
Respiratory rate (Breathes/minute)	23.86(3.64)	16.08 (1.88)	0.001*	23.98 (4.44)	22.88 (1.99)	0.001*

[a] Paired t-test, *
Statistically significant.

Discussion:

The best technique to lessen pain during surgeries, especially for young patients, is to divert patients with colorful stories (Donna and Ran, 2018). It is crucial to use non-pharmacological therapies to lessen discomfort after surgery in children. The amount of pain was reduced by several interventions, including the pre-operative prescription of a sedative, a proper educational preparation program, and parental presence throughout the entire surgical and anesthesia procedure (**Kain et al, 2017**). Children may experience postoperative pain, which could make it harder for them to recover from surgery. After surgery, children should feel less pain.25 Interventions to lessen children's suffering during the recovery phase were included in the current study. Hence, the study aimed to investigate the effect of animated stories on pain intensity and physiological parameters among post-operative children.

The results of the present investigation demonstrated that the demographic data of the experimental group and the control group did not differ statistically significantly from one another. According to the researchers, this is seen in the similarity of the features between the virtual group and the control group.

The results of the current study showed that, compared to more than one-third of the children in the control group, half of the children in the pretest experimental group had pain intensity that decreased to less than ten percent after the intervention. This might be caused by their ignorance of protocols, a lack of self-control, or attention brought on by animated storytelling. This may be connected to the fact that youngsters might benefit from animated storytelling as a means of lowering pain.

This can be connected to the fact that distraction can break the link between a child's emotional suffering and pain intensity, which reflects the beneficial benefits of animated storytelling intervention and lowers pain levels. According to **Mohamed's (2018)** Egyptian study, In the pretest, more than half of the 50 children in the paediatric surgical ward reported feeling extremely uncomfortable throughout the painful operation, whereas more than two-thirds of them reported less discomfort in the

posttest.

In addition, **Samaneh et al. (2017**) who studied the effects of distraction on physiological indicators and pain intensity in children aged 3-6 receiving IV injections found that the difference in mean pain scores between the experiment groups after the injection was not significant. The thalamus, insula, and anterior cingulated cortex, which are involved in fear and pain processing, may have been less active when A diversion activity distracted the children's attention **(Martin, 2020).**

These results are consistent with a study by **Aminabadi et al. (2019**), which found that animated stories significantly decreased children's perceptions of discomfort during dental treatment and enhanced their interactions with the dentist. This outcome, according to the researchers, demonstrated the watching method's positive effects as a pain-relieving distraction approach. Similar results were reported by **Bellieni et al. (2018**), who found that by utilising distraction techniques, school-aged children experienced less pain from I.V. catheters. Additionally, the findings of the study by **Sinha et al. (2016**) showed that distraction could lessen the discomfort associated with stitching in children under the age of ten. The study evaluated non-pharmacologic techniques of pain and anxiety management for laceration repair in the pediatric emergency department. This study is in line with that of **Zarei et al. (2019**) and **Sekhavatpour et al. (2019),** who found that storytelling is a successful, inexpensive technique and a child's preferred non-pharmaceutical intervention. It's thought that telling stories to kids can help them experience less discomfort and anxiety.

The results of the current investigation showed that there was a statistically significant difference in pain intensity between the experimental group and the control group. This demonstrated the value and beneficial impact of animated storytelling as an intervention for lowering pain in pediatric surgery patients.

According to the study's findings, there was a statistically significant difference between the pre-and post-intervention pain intensity mean values in the experimental group between the pre-and post-intervention, with a high mean difference value. According to the study, it showed that animated storytelling had a positive effect on reducing the severity of pain. However, these results go against those of **Kavak Akelma et al. (2020**), who discovered no significant differences in mean pain scores in the study group.

According to the results of the current study, there were statistically significant changes in the physiological parameters of the experimental group's systolic blood pressure, diastolic blood pressure, heart rate, and respiratory rate as compared to the control group, which had lower mean differences than the experimental group.

The efficiency of the animated story intervention, as seen from the researchers' perspective, is demonstrated by the fact that the experimental group's study subjects' physiological parameters score improved. Additionally, it demonstrated the value, strength, and success of the use of animated stories, which helped to raise the mean scores for physiological measures.

Twelve patients undergoing cardiac surgery participated in a study by **Luis et al. (2018**) to determine the impact of animated stories on physiological parameters. Patients were randomly assigned to either the intervention group or the control group and given customized stories for 20 minutes before and after surgery, while patients in the control group heard the standard hospital noises. The researchers discovered that animated stories were regulating the physiological parameters score of the children who participated in the study.

This finding contrasts with **Miller et al.'s (2018**) research on the impact of employing technology to treat pain in young wounded children, which found no

differences in the way physiological measurements are regulated between various injured children and the control group.

The results of a randomized controlled trial on the impact of animated storytelling on pain and physiological parameters in heart surgery conducted by **de Andrade et al (2022)** confirm these conclusions. The study's findings may help with the application of non-pharmacological therapies in healthcare, particularly protocols for animated stories, to lessen discomfort during cardiac surgery.

Systolic blood pressure, diastolic blood pressure, heart rate, and respiratory rate levels of physiological parameters among postoperative patients in the study group have significantly decreased in mean scores and improved mean scores of oxygen saturation with higher mean differences and with statistically highly significant differences between before and after intervention.

The aforementioned findings are in line with those of a randomized controlled clinical trial conducted by **Shokati Ahmadabad et al. (2016**) among 50 patients on the impact of listening to preferred music on pain intensity and physiologic parameters in patients undergoing coronary artery bypass grafting surgery. Patients in the group "A" received standard postoperative treatment. Patients in group "B" receive routine care in addition to listening to two 30-minute sessions of their favorite animated stories. Before and 30 minutes after the intervention, standard equipment was used to monitor the patient's pain levels and physiologic parameters (heart rate, respiration rate, diastolic and systolic blood pressure).

The study found that the use of animated stories was effective in lowering pain levels and that these interventions had a better impact on children in the experimental group than on patients who did not receive such care in terms of changes in heart rate, respiratory rate, and systolic and diastolic blood pressure, among other physiological parameters. These results unequivocally demonstrate the beneficial effects of animated storytelling on controlling physiological parameters and reducing post-operative discomfort. As a result, the study's main finding—that animated stories are effective at lowering pain intensity and had a positive impact on physiological measures in the experimental group relative to the control group—was confirmed.

The research by **Shabandokht-Zarmi et al., (2017**) and the conclusions presented above are comparable, conducted a non-random, convenience sampling study using three groups of 114 dialysis patients to examine the impact of animated storytelling on the discomfort associated with fistula puncture. Within a minute of the venepuncture technique, the fistula puncture-related pain was assessed in each of the three groups. In this study, the animated story and headphone groups were different after the intervention, and there was a lower mean pain score between the animated story and control groups.

Primary nursing care procedures, family-centered care, and atraumatic care are all included in pediatric nursing. According to earlier research, non-pharmacological approaches including occupational therapy, games, music, cartoons, and videos that emphasize the creative side of life are utilized in reducing postoperative pain, just as other medical procedures. In diverse age groups of children, non-pharmacological approaches to reducing postoperative pain were discovered through a systematic review. Information-gathering, breathing techniques, touching, music, positioning, massage, diversion, and visualization are some of these techniques **(Sayar & Ergin, 2019).**

Conclusion:

Based on the findings of the present study and research hypothesis it concluded that animated stories were found to be more effective in reducing

pain, diastolic blood pressure, and heart rate among post-operative children in the experimental group than those in the control group who received only routine hospital care.

Recommendations:

- The following suggestions were made in light of the study's findings:
- Animated storytelling must be used as a tool in post-operative care as a form of non-pharmacological treatment.
- In the post-operative units, in this process, education gave in a fun and practical way that will attract the attention of the child and facilitate the adaptation to practice of the child.
- Animated stories should be used as non-pharmacological management by nurses who care for children in addition to the usual hospital program.
- More studies can be recommended on nursing education programs specific to the age groups of children for the management of pain in the preoperative period.
- It is recommended that future studies explore the use of distraction techniques, such as animated stories and other interventions, as non-pharmacological methods for pain relief.
- Informing parents and nurses about the benefits of using animated storytelling to divert anxious and hurting children.
- In order to generalize the results of the current study, it must be conducted again with a larger sample of children undergoing surgical procedures in a variety of settings.
- More research must be done on the impact of mixing other non-pharmacological strategies, such imagination and animated storytelling, as a kind of treatment for children's discomfort.

References

- **Al Sutari M., Abdalrahim M., Hamdan-Mansour A., & Ayasrah S. (2019):** Pain among mechanically ventilated patients in surgical units. *J Res Med Sci*; 19(8): 726-32.
- **Aminabadi N., Vafaei A., Erfanparast L., Oskouei S., & Jamali Z. (2019):** Impact of pictorial story on pain perception, situational anxiety and behavior in children: a cognitive-behavioral schema. *J Clin Pediatr Dent*; 36(2):127–132.
- **Aydin, G., Yüksel, S., Ergil, J., Polat, R., Akelma, F. K., Ekici, M., & Odabas A. (2019):** The effect of play distraction
- **Bellieni C., Cordelli D., Raffaelli M., Ricci B., Morgese G., & Buonocore G. (2018):** Analgesic effect of watching TV during venipuncture. *Arch Dis Child*; 91 (12):
- **Bojorquez G., Jackson K., & Andrews A. (2020):** Music therapy for surgical patients: approach for managing pain and anxiety. *Crit Care Nurs Q*; 43(1): 81-5.
- **Chow C., Van Lieshout R., Schmidt L., Dobson K., & Buckley N. (2015):** Systematic review: audiovisual interventions for reducing preoperative anxiety in children undergoing elective surgery. *J Pediatr Psychol*; 41(2):182–203.
- **De Andrade É., Haas V., De Faria M., Dos Santos Felix M.,Ferreira M., Barichello E. (2022):** Effect of animated stories on pain and cardiorespiratory parameters in cardiac surgery: study protocol for a randomized clinical trial. Trials; 23(1): 278.
- **Donna, A. & Ran, c., (2018):** Distraction Techniques for

Children Undergoing Procedures: A Critical Review of Pediatric Research Article (PDF Available) *in Journal of pediatric nursing* 27(6).

- **Elmistekawy E., & Attia A. (2020):** Chronic post operative pain: the role of sternal wire removal: a review. AME Med J; 5: 31.
- **Gonçalves L., Voos M., Almeida M., & Caromano FA. (2017):** Massage and storytelling reduce aggression and improve academic performance in children attending elementary school. Occup Ther Int; 1–7. Doi: 10. 1155/ 2017/ 5087145.
- **Hassan A. (2015):** "Effect of Guided Imagery Relaxation Session and Story- Telling on the Intensity of Nausea and Vomiting among Children Undergoing Chemotherapy, doctoral Degree, Nursing, Tanta University.
- **Hatipoglu Z., Gulec E., Lafli D., & Ozcengiz D. (2018):** Effects of auditory and audiovisual presentations on anxiety and behavioral changes in children undergoingelective surgery. *Niger J Clin Pract*.; 21(6):788–794. Doi:10. 4103/ njcp. njcp_ 227_17.
- **Hendra K., Sims C., & Boshra S. (2019):** The effect of music listening on anxiety and pain in chronically and terminally iII patients. *J Geriatr Med Gerontol*; 5(3): 73. Doi: 10.23937/2469-5858/1510073
- **Hosseinpour M., & Ahmadi B. (2016):** Emergency Abdominal Surgery in Infants and Children. Submitted: November 18th 2015Reviewed: April 13th Published: September 21st 2016. DOI: 10.5772/63649. Open access peer-reviewed chapter.
- **Kain Z., Caldwell-Andrews A., & Mayes L. (2017):** Family-centered preparation for surgery improves perioperative outcomes in ChildrenA randomized controlled trial. Anesthesiol; 106(1):65–74. Doi: 10.1097/00000542-200701000-00013.
- **Kavak Akelma F., Altınsoy S., Arslan M., & Ergil J. (2020):** Effect of favorite animated stories on postoperative anxiety and pain. Anaesthesist; 69(3): 198-204. Doi: 10.1007/s00101-020-00731-8
- **Kennedy R., Luhmann J., & Zempsky T. (2018):** Clinical implications of unmanaged needle-insertion pain and distress in children. Pediatrics; 122S:130–33.
- **King Lindley J. (2022):** Physical Therapy to Help Chronic Pain. Available from: https://www.everydayhealth. com/pain-management/-therapy-for-pain-management.aspx.
- **Luis M., Doss R., Zayed B., & Yacoub M. (2019):** Effect of live oud music on physiological and psychological parameters in patients undergoing cardiac surgery. *Glob Cardiol Sci Pract*; (2): doi: 10.21542/gcsp.2019.17
- **Martin, A. (2020):** Measuring chemotherapy –induced nausea and emesis. Cancer, 98(6):645-655.
- **Middleton, F. (2019):** Reliability vs. Validity in Research | Difference, Types and Examples. Scribbr. Retrieved October 30, from https://www.scribbr.com/methodology/reliability-vs-validity/
- **Miller, K., Rodger, S., Bucolo, S., Greer, R., & Kimble, R. (2018):** Multi-modal distraction. Using technology to combat pain in young injuries children; 36(5), 647-658.
- **Mohamed S. (2018):** The effect of selected- distracters on intensity of

pain and fear in children undergoing painful procedures. *Egypt J Nurs* 1:76–87.

- **Redding J., Plaugher S., Cole J., Crum J., Ambrosino C., & Hodge J. (2016):** "Where's the music?" Using music therapy for painmanagement. Fed Pract; 33(12): 46-9.
- **Samaneh N., Chehrzad M., Abotalebi G., & Atrkar Z. (2017):** Effects of Distraction onPhysiologic Indices and Pain Intensity in children aged 3-6 undergoing IV Injection. HAYAT; 16 (3 and 4):39-47.
- **Sayar S., & Ergin D. (2019):** Examination of the effect of music upon the postoperative pain management in pediatric patients who are hospitalized in the orthopedics service. DEU E-*Journal NF*; 12:67–73.
- **Sekhavatpour Z., Khanjani N., Reyhani T., Ghaffari S., & Dastoorpoor M. (2019):** The effect of storytelling on anxiety and behavioral disorders in children undergoing surgery: a randomized controlled trial. Pediatric Health Med Ther. 2019; 10: 61–
- **Shabandokht-Zarmi H., Bagheri-Nesami M., Shorofi S., & Mousavinasab S. (2017):** The effect of animated stories on fistula puncture-related pain in hemodialysis patients. Complement Ther Clin Pract; 29: 53-7. Doi: 10.1016/j. ctcp.2017.08.002.
- **Shokati Ahmadabad M., Changizi A., Ghorbani S., Azarasa M., & Rafiei H. (2016):** Effect of listening to preferred music on intensity of pain and physiologic parameters in patients undergoing coronary artery bypass grafting surgery. *IOSR J Nurs HealthSci*; 5(4): 79-82. doi: 10.9790/1959-0504027982
- **Sinha M., Christopher N., Fenn R., & Reeves L.(2016):** Evaluation of non-pharmacologic methods of pain and anxiety management for laceration repair in the pediatric emergency department Pediatrics; 117(4):1162–8.
- **Sola C., Lefauconnier A., Bringuier S., Raux O., Capdevila X., & Dadure C. (2017):** Childhood preoperative anxiolysis: Is sedation and distraction better than either alone? A prospective randomized study. *Paediatr Anaesth*; (34) 27:827–. https://doi.org/10.1111/pan.13180.
- **Srouji R., & Ratnapalan S. (2017):** Pain in Children: Assessment and Non-pharmacological Management. Int *JPediatr:* 11–12.
- **Tercan B., & Sarıtaş S. (2017):** Knowledge and practice situations of nurses on non-pharmacological methods and in pain management. New Trends and Issues Proceedings on Advances in Pure and Applied Sciences. 8, 8, 98-105.
- **Williams M. (2022):** Health Benefits of Music Therapy. Available from: https://www.cprcertified. com/health-benefits-of-music-therapy.
- **Wong, D., & Baker C. (1988):** Pain in children: comparison of assessment scales, PediatricNursing, 14(1):9-17.
- **Zarei K., Parandeh Motlagh Z., Seyedfatemi N., Khoshbakht F., Haghani H., & Zarei M. (2019):** Impact of narration on physiological, worry and social anxieties in hospitalized school-aged children. *Med- Surg Nursing Journal*; 2(3, 4):115–121.