

Impact of Animated Stories for Children undergoing Surgical Procedure on their Preoperative Anxiety and Postoperative Pain Level

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Abstract

Background: Children who are undergoing surgical procedures experienced anxiety and pain, and they require both physically and psychologically preparation. **The purpose of this research was to** evaluate the impact of animated stories for children undergoing surgical procedures on their preoperative anxiety and postoperative pain level. **Design:** Quasi-experimental research design was used in the present study. **Subjects:** The study included a purposive sample of 200 children from 5-9 years who were equally divided into two groups, the first was the control group and the second was the animated stories, intervention group. **Setting:** This study was carried out in pediatric wards of Port Said General Hospitals. **Tools:** An Interview Structured Questionnaire was developed by the researchers, State-Trait Anxiety Inventory for Children, and Wong-Baker FACES Pain Rating Scale was utilized for collecting the data. **Results:** Preoperative anxiety scores and postoperative pain were lower among children after animated story intervention than before. More than two-fifth of children in the animated stories intervention group were reporting hurts little bit pain on WBFS. Highly statistically significant difference was detected between the total mean score of postoperative intensity of pain scores among children undergoing surgical procedure on WBFS between animated stories intervention and the control groups ($P=0.001$). **Conclusion:** When compared to children in the control group who got regular hospital care, the animated storytelling method is an excellent distraction method for reducing preoperative anxiety and postoperative pain among children undergoing surgery. **Recommendations:** Nurses who care for children should use animated stories as non-pharmacological management in addition to standard hospital programs for children undergoing surgical procedures to minimize preoperative anxiety and postoperative pain levels.

Keywords: Animated stories, Preoperative anxiety, Post-operative pain, Children, Surgical procedure.

Introduction

Surgical procedures for children cause anxiety and pain, which has a negative impact on the children's physical and psychological aspects, leads to increase anxiety and pain level after surgery. Approximately 60% of children have experienced significant anxiety before surgery. These children may exhibit distress behaviors such as feeling frightened, crying, grasping to their loved ones tightly, or trying to escape, the risk of emergence agitation, and even long-term behavior abnormalities and psychological disorders (Sola et al., 2017).

Limited cognitive capacities, experience deficiencies, the need for other people's support, failure to recognize the meaning of the surgery, fear of physical injury or pain, mutilation, or death, communicating with

strangers in the absence of family, mistrust in adults, fear of the unknown, insecurity about the limitations and acceptable behavior, and loss of independence or control are all reasons that children may experience negative feelings and anxiety (Aytekin et al., 2016). Children who are anxious or in pain are more likely to oppose and refuse pre and post-operative care. As a result, one of the most crucial nursing roles is to reduce child's worry and physical, emotional, and cognitive preparations (Academy for Guided Imagery, 2019).

Pain is one of the most prevalent health problems in children, and it is regarded to be the body's most important defense mechanism when it occurs under abnormal physiological conditions. Due to the difficulty of assessing pain in children, several age-specific pain

treatment instruments and ratings have been created (Srouji and Ratnapalan, 2017). Surgical treatments are a common source of pain in youngsters. Many children, in addition to experiencing discomfort during venipuncture, also experience anxiety before procedures, which can exacerbate a child's pain perception and anxiety, leading to a bad experience. Because pain has some long-term negative consequences, alleviating pain and suffering is a critical responsibility of nurses caring for children (Kennedy et al., 2018).

Anxiety and pain are common in children undergoing surgical procedures, and they require both physical and psychological preparation. Non-pharmacological therapies, such as distraction interventions, child training, and acceptance of the child in the operating room, have been claimed to minimize preoperative anxiety and post-operative discomfort. Distraction is a highly effective, simple, and cost-effective strategy that poses no risk to the children and provides a demonstrable benefit since it minimizes the amount of anxiety and pain experienced by the majority of children (Shapiro, 2011).

Audio-visual distraction, such as animated stories, is a simple method that helps nurses deal with the problem of lack of attention to pain management by passively redirecting the subject's attention or engaging the subject in a diversion activity (Hatipoglu et al., 2018). By diverting attention away from one's anguish and focusing on care for others, more positive thoughts, and distracting with other sensations, animated storytelling can stimulate emotions and sever the connection between a person and his or her emotional pain (Hassan, 2015). Animated stories have been claimed to alleviate anxiety before surgery. Listening to stories is something that children like doing. Motivation and enjoyment are induced through stories. Distraction therapies, such as viewing cartoons, playing therapeutic activities or video games, or listening to stories or music appropriate to the child's age group, will help to reduce the intense anxiety and terror experienced by children during the preoperative time (Goncalves et al., 2017).

Nurses must be knowledgeable of the worry and suffering that children face as a

result of surgery. Nurses must grasp what anxiety and pain are and how children convey their fear and pain to support children. Children can show their worry in a variety of ways, including not talking much or retreating, as well as describing it in detail (Li et al., 2016). Previous research has shown that children of all ages are anxious before undergoing a medical procedure, but that younger children have a more dispersed anxiety and unease (Aydin et al., 2017). Nurses should ease a child's pain not only because of the dangers of untreated pain, but also because pain treatment can lead to earlier mobilization, shorter hospital stays, and lower expenses (Harsh, et al., 2019).

Significance of the study:

Surgical treatments are one of the most terrifying procedures for children experiencing substantial anxiety and pain. Children's pain alleviation is not only a moral obligation, but it also helps to avoid short- and long-term effects (Hosseinpour and Ahmadi, 2016). As a result of terrible encounters in a hospital or clinic, children may avoid future medical treatment. Many children undergoing surgery experience anxiety throughout their stay in the hospital, which can have a severe impact on their physical, psychological, behavioral, cognitive, and academic development. Reducing the anxiety level in children undergoing surgery can be seen as an investment in the child's health to limit the negative effects in their later life.

Chow et al. (2015) found that audiovisual interventions were beneficial in reducing preoperative anxiety in children undergoing surgery, and Aminabadi et al. (2011) show that visual animation storytelling had a statistically significant effect on minimizing pain and anxiety in children visiting the dentist. There is little research on the effectiveness of animated storytelling as a distraction tactic for children undergoing surgical procedures. Therefore, the current study aimed to evaluate the effect of animated stories for children undergoing surgical procedures on their preoperative anxiety and postoperative pain level.

Operational definitions:

Animated Story: It is a method of photographing successive drawings, models, or

even puppets, to create an illusion of movement in a sequence because eyes can only retain an image for approx. To create the appearance of smooth motion from these drawn, painted, or computer-generated images, frame rate, or the number of consecutive images that are displayed each second, is considered. Moving characters are usually shot “on twos” which just means one image is shown for two frames, totaling in at 12 drawings per second. 12 frames per second allow for motion but may look choppy. In the film, a frame rate of 24 frames per second is often used for smooth motion.

Preoperative anxiety: is often described as an uncomfortable, tense unpleasant mood before surgery, an emotional response to a potential challenge or threat to reality. It is influenced by the patient's concern about his or her general health, uncertainty regarding the future, type of surgery and anaesthesia to be performed.

Postoperative anxiety: It is often described as an uncomfortable, tense unpleasant mood after surgery occurred due to discomfort and pain, incapacitation, loss of independence, and fear of death

Aim of the study:

This study aimed to evaluate the impact of animated stories for children undergoing surgical procedure on their preoperative anxiety and postoperative pain level.

Research hypothesis:

Children who exposed to animated stories will experience low level of anxiety and pain than those not exposed to animated stories.

Materials and method:

Research design:

A Quasi-experimental research design was used in the present study.

Setting:

The current study was conducted in pediatric wards in EL-Nasr Specialized Hospital for Children and pediatric intensive care unit in EL-Salam hospital at Port Said Governorate.

Subjects:

The study included a purposive sample of 200 children aged 5 to 9 years old who were equally divided into two groups: the control group, which included 100 children, and the animated stories intervention group, which included 100 children in the same setting within six months.

Sample size:

Sample size was calculated based on a power analysis of $0.95(\beta=1-0.95=0.5)$ at alpha .05 (one-sided) with large effect size (0.5) was used as the significance, 0.001 was used as the high significance.

Sampling technique:

A purposive sampling technique was used to collect data. The studied sample was divided randomly into animated stories intervention and control groups. The coin was used in selecting the sample where the face of writing is selected for the animated stories intervention group and the face of the king is selected for the control group.

Inclusion criteria included:

- (1) Children aged 5 to 9 years were included in the study.
- (2) Goal-oriented children.
- (3) Children who were present during the pre-operative period (the day before surgery).

Exclusion criteria included:

- (1) Children with developmental or neurological health concerns.
- (2) Children with the mental health problem.
- (3) Children with significant hearing or visual impairment

Tools of data collection:

Tool (I): An Interview Structured Questionnaire: was developed by the researchers after reviewing the related literature; it included 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.

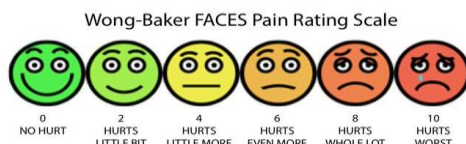
Tool (II): State-Trait Anxiety Inventory for Children (STAIC): was developed by **Spielberger (1970)** to measure transitory

anxiety state in children. The scale is made up of 20 statements that question kids how they are feeling at any given time. There are five subscales for scale statements (sadness, worry, fear, uncertainty, and anxiety). Children were told to answer in accordance with their feelings about their procedures. The children choose one of three options (rarely, sometimes, and often). One, two, and three were assigned to response categories.

Scoring system:

The total scores are the sum of the item scores; there were 60 total scores. Scores ranging from 20 -30 were deemed moderate anxiety, 30–40 were regarded as ordinary, 40–50 were considered above average, and 50–60 were considered extremely high anxiety. **El Samman et al., (2009)** translated the scale into Arabic and then back-translated it into English. Nine specialists in the disciplines of pediatric and psychiatric nursing evaluated and tested the translation for content validity.

Tool III: Wong-Baker FACES Pain Rating Scale, used to assess the effectiveness of animated stories in pain response among children. It has a total score of 10 points and is made up of 6 points. It was used to show children's pain perception. The scale displays a series of faces ranging from a happy 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 maximum score of 10 and the minimum score of 0 categorized as 0 – No Hurts, 2 – Hurts Little Bit, 4 – Hurts Little More, 6 – Hurts, Even More, 8 – Hurts Whole Lot, 10 – Hurts Worst. The face that best portrayed how a youngster feels during an intravenous injection was chosen by the researcher (**Wong and Baker, 1988**).



Tools validity:

The tools' content reliability was evaluated by a panel of five professors' experts, three professors' experts in Pediatric Nursing,

and two professors' experts in Psychiatric Nursing, who all had more than ten years of experience in the field. According to the panel's decision on sentence clarity, appropriateness of content, item sequencing, and accuracy of scoring and recording of the items, no changes to the tools were made.

Tools Reliability:

Tools reliability was tested using internal consistency methods (Alpha Cronbach's test first tool, its result was (0.89, 0,) which indicates good reliability of the tool, the reliability coefficients' α between items of STAIC was 0.86.

- Wong-Baker FACES Pain Rating Scale, the WBS were highly correlated (Spearman's $\rho > 0.80$) with those on a visual assessment scale (VAS) (**Garra, et al., 2010**).

Procedure:

Preparatory phase:

It included reviewing related literature and theoretical knowledge of various aspects of the study using books, articles, the internet, periodical, and magazines to develop tools of data collection. This also helped with the creation of the testing tools.

Pilot study:

It was carried out on 10 % of children (20 children) to test the clarity and applicability of the tools and estimate the time needed for data collection. Based on the result of the pilot study no modification was done in the tools, the children in the pilot were excluded from the total sample.

Ethical considerations:

Administrative approval was obtained from the setting's directors before the start of this investigation. The researchers first introduced themselves to the mothers of the children and then explained the goal of the study at the start of the interview, assuring the mothers that all information acquired would be kept private. After receiving the children's oral permission for data collection, the researchers interviewed them and gave them a thorough description of each tool.

Following an explanation of the study's purpose to the mothers and their children,

informed consent was acquired. The participants were advised that participation in the study was completely optional, that they could opt-out at any moment, and that they had the right to withdraw at any time. They were also told that their information would be kept private and utilized just for research.

Fieldwork:

Data was collected From May to November of 2021. The interview took place across two days during the week, from 9 a.m. to 12 p.m. The questionnaire took roughly 25-30 minutes to complete for each participant. Tool II and III was used by the researchers as pre and post-intervention.

The Implementation of the study was carried out in three phases (assessment phase, implementation phase, and evaluation phase).

I- Assessment phase:

The researchers introduce themselves to the children then explained to them the aim and expected outcomes of the study before collecting data. Demographic and clinical data of the children were assessed by the researchers. The tools used for collecting data were used as pretest tools (tool II and tool III). Pre-testing tools were used to assess pre-operative children's anxiety and pain.

II- Implementation phase:

The day before surgery, the children got routine care as, fasting time, hygiene, physical examination, and vital signs. In addition, animated stories intervention was received. The first phase included animated stories that consisted of moving pictures or short videos with colorful, attractive graphics. The second phase of the process includes a discussion of the animated stories with child. The State-Trait Anxiety Inventory for children was used to assess the effectiveness of animated stories on reducing preoperative anxiety. The day of operation, Wong-Baker FACES Pain Rating Scale was used to assess the effectiveness of animated stories on reducing postoperative pain in children after received animated stories intervention.

The researcher was in the room when the animated stories began to play. The animated stories were displayed for about 15 minutes on

an eye-screen tracker to register visual attention while listening to them. The data collection in the current study included two phases: preoperative assessment for anxiety (pre and post intervention). Post-operative assessment of pain levels (pre and post intervention).

III- Evaluation phase:

After the implementation of the animated stories, the children's anxiety and pain were evaluated the day of operation by using the same pre-test tools (tool II and III).

Administrative design:

Administrative permission was obtained through an issued letter from the Dean of Faculty of Nursing, Port Said University to the directors of the pediatric wards in EL-Nasr Specialized Hospital for Children and pediatric intensive care unit in EL-Salam hospital at Port Said Governorate to achieve this study.

Statistical analysis:

Data entry and data analysis were done using SPSS version 19 (Statistical Package for Social Science). Data were presented as a number, percentage, mean, median, and standard deviation. The Chi-square test and Fisher exact test were used to compare qualitative variables. Mann-Whitney test was used to compare quantitative variables between two groups. P-value considered statistically significant when $P < 0.05$.

Results:

Table (1): Illustrated the demographic characteristics of the intervention and control groups for animated stories. As regard age, children in the animated stories intervention group (56%) and children in the control group (50%) were 7 to 9 years old, with $M \pm SD$ (5.36 ± 3.65 and 5.52 ± 3.76 , respectively). The animated stories intervention and control groups had the most boys (58 % and 59 %, respectively). Concerning demographic characteristics, there was no statistically significant difference between the animated stories intervention group and the control group.

Table (2) showed that in the animated stories intervention group, 55 percent of the children were undergoing Tonsillectomy & Adenectomy, followed by those exposure to

different type of accident (30 %), while in the control group, 48.0% of the children were undergoing Tonsillectomy & Adenectomy, followed by those exposure to different type of accident (36.0%). Regarding previous hospitalization, (78% and 85%, respectively) of studied children in animated stories intervention group and control group had no history of previous hospitalization.

Table (3) portrayed that, there was a highly significant difference between control and animated stories intervention groups regarding anxiety level pre and post intervention. In addition, the same table illustrated that anxiety level in the animated stories intervention group has improved post intervention in which 68% had moderate anxiety level and no one of children have extremely high anxiety level.

Table (4) Revealed that before the animated stories intervention, the total mean STAIC score among the studied children was 46.7 ± 2.2 , which reduced to 24.8 ± 1.6 in the

intervention group compared to 40.23 ± 5.02 in the control group. Between the animated stories intervention group and the control group, there was a high statistically significant difference in total mean STAIC score ($P=0.001$).

Table (5) cleared that, 14% of previous hospitalized children compared to 37% of non-pervious hospitalized children had moderate anxiety level in animated stories intervention group and there was statistical significant differences between previous hospitalized and non-pervious hospitalized children in animated stories intervention group ($P < 0.001$).

Table (6) found that 48% of the studied children in the pretest animated stories intervention group had a Hurts Worst level of pain intensity that declined to 8% post intervention compared to 31% in the control group. In addition, there was statistically significant difference between the animated stories intervention group and the control group regarding intensity of pain ($P < 0.001$).

Table (1): Distribution of the studied children in animated stories intervention and control groups regarding their demographic characteristics

Demographic characteristics	Animated stories intervention group (n= 100)		Control group (n= 100)		P-value
	No	%	No	%	
Age: (years)					
5 - <7	44	(44.0%)	50	(50.0%)	0.512
7 - ≤9	56	(56.0%)	50	(50.0%)	
Mean ± SD	5.36 ± 3.65		5.52 ± 3.76		0.334
Gender:					
Boys	58	(58.0%)	59	(59.0%)	0.664
Girls	42	(42.0%)	41	(41.0%)	

Table (2): Distribution of the studied children in animated stories intervention and control groups regarding their clinical characteristic.

Clinical characteristics	Animated stories intervention group (n= 100)		Control group (n= 100)		P-value
	No	%	No	%	
Medical diagnosis					
Tonsillectomy & Adenectomy	55	(55.0%)	48	(48.0%)	0.896
Accident	30	(30.0%)	36	(36.0%)	
Hernia	8	(8.0%)	10	(10.0%)	
Intestinal Obstruction	4	(3.0%)	3	(3.0%)	
Others	3	(3.0%)	3	(3.0%)	
Previous hospitalization					
Yes	22	(22.0%)	15	(15.0%)	0.987
No	78	(78.0%)	85	(85.0%)	

Table (3): Distribution of anxiety level between the control and animated stories intervention groups

Anxiety level	Animated stories intervention group (n= 100)				Control group (n=100)				p-value
	Pre		Post (n/%)		Pre		Post		
	No	%	No	%	No	%	No	%	
Moderate anxiety	23	23.0	68	68.0	22	22.0	24	24.0	0.001*
Ordinary anxiety	24	24.0	27	27.0	25	25.0	28	28.0	
Above average anxiety	44	44.0	5	5.0	33	33.0	37	37.0	
Extremely high anxiety	9	9.0	0	0.0	10	10.0	11	11.0	

P<0.001, very highly statistically significant difference

Table (4): Comparison between mean anxiety scores in the animated stories intervention and control groups' pre and post intervention

State-Trait Anxiety Inventory	Animated stories intervention group (n= 100)	Control group (n= 100)	P-value
The total mean score of STAIC before animated stories intervention	46.7±2.2	46.03±3.22	P<0.001**
The total mean score of STAIC after animated stories intervention	24.8±1.6	40.23±5.02	

P<0.001, very highly statistically significant difference

Table (5): Association between anxiety level among the studied children in animated stories intervention and their previous hospitalization

Anxiety level	Animated stories intervention group (n= 100)				Control group (n=100)				X2	P-value
	Hospitalized (n=22)		Non-hospitalized (n=78)		Hospitalized (n=15)		Non-hospitalized (n=85)			
	No	%	No	%	No	%	No	%		
Moderate anxiety	3	14.0	29	37.0	2	13.0	12	14.0	38.7	<0.001*
Ordinary anxiety	8	36.0	20	26.0	5	33.5	28	33.0		
Above average anxiety	7	32.0	24	31.0	5	33.5	32	38.0		
Extremely high anxiety	4	18.0	5	6.0	3	20.0	13	15.0		

P<0.001, very highly statistically significant difference

Table (6): Comparison between postoperative intensity of pain among children in animated stories intervention and control groups pre and post intervention.

The intensity of Pain onWBFS	Animated stories intervention group (n= 100)				Control group (n=100)				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	7	7.0	30	30.0	6	6.0	10	10.0	
Hurts Little More	16	16.0	22	22.0	14	14.0	18	18.0	
Hurts Even More	10	10.0	28	28.0	10	10.0	23	23.0	
Hurts Whole Lot	19	19.0	12	12.0	20	20.0	18	18.0	
Hurts Worst	48	48.0	8	8.0	50	50.0	31	31.0	

P<0.001, very highly statistically significant difference

Discussion:

Using animated stories as distraction strategies is the most effective way to reduce anxiety and pain during surgical operations

especially in children (Donna and Ran, 2018). Non- pharmacological interventions aimed at reducing anxiety and negative psychological effects in children following surgery are critical. Prescription of a sedative prior to

surgery, psychological support and suitable educational preparation program, and parental attendance during the entire surgery and anesthesia procedure among the interventions led to reduction of anxiety level and pain level (**Kain et al, 2017**). Hence, the study aimed to evaluate the effect of animated stories for children undergoing surgical procedure on their preoperative anxiety and postoperative pain level.

The present study findings reported that slightly less than half of children had above average anxiety level before the animated stories intervention, this percentage reduced to 5% after the animated stories intervention was applied. This is may be due to their lack of knowledge of procedures, a lack of control and distraction induced by animated stories. This could be related to animated storytelling being a beneficial tool for children in alleviating anxiety. This result is consistent with **Ko et al. (2021)** who reported that, it is estimated that around 50–70% of hospitalized children experience severe anxiety and distress before surgery. **Nisha and Umarani (2019)** who emphasized mentioned the same results on the effectiveness of play intervention in the reduction of anxiety among preoperative children.

Furthermore, **Perry et al. (2019)** conducted a study on preoperative interventional teaching strategies to reduce preoperative anxiety in children using age-appropriate educational interventions, which supports the findings of the current study by demonstrating that psychological preparation of children prior to surgery is an effective way to reduce preoperative anxiety and postoperative behavioural disorders. According to the findings of **Zarei et al. (2019)** and **Sekhvatpour et al. (2019)**, presented storytelling is an effective, low-cost strategy, and the child's favourite non-pharmaceutical intervention. It's believed that storytelling can help children feel less anxious.

Concerning STAIC score among the studied children, it was observed that before the animated stories intervention, the total mean was 46.7 ± 2.2 , which reduced to 24.8 ± 1.6 in the intervention group with a statistically significant difference in total mean STAIC

score ($P=0.001$). This reflected the importance and positive effect of animated stories intervention in reducing anxiety among children undergoing surgical procedure. These results is supported by **Noronha and Shanthi (2015)** at Mangalore who found in their study about effectiveness of picture book on preoperative anxiety among children (6–12 years) in selected hospitals that majority of the children in the experimental group had severe anxiety in pretest and during post-test, more than half of children in the experimental group had mild to moderate anxiety as compared with the control group. Hence, it is attributed to picture book is found to be effective in reducing preoperative anxiety among children. **Moghimian et al (2019)** who reported that patients' anxiety before open-heart surgery was alleviated by visual animated storytelling.

The present study illustrated that, less than one fifth of previous hospitalized children compared to more than one third of non-previous hospitalized children had moderate anxiety level in animated stories intervention group and there was statistical significant differences between previous hospitalized and non-previous hospitalized children in animated stories intervention group. This may be due to familiarity of children for medical sitting and staff member. A similar study conducted by **Moura et al. (2016)** more than a fifth of the children had previously been hospitalized for surgery and suffered from preoperative anxiety. In contrast, several studies have discovered that a child's anxiety is unrelated to previous hospitalization. Children who had never been in a hospital before, as well as those who had had fewer surgeries, showed more fear than those who were already experienced with the medical environment. Anxiety levels did not differ significantly between children who were hospitalized and those who were not, suggesting that anxiety levels that usually accompany children during their daily lives were not altered by the hospitalization. Anxiety did not differ significantly between children admitted for the first time and children who had previously been hospitalized, indicating that the structural level of anxiety was maintained at a normal level (**Delvecchio, et al., 2019**).

Results of the current study highlighted that slightly less than half of children in the animated stories intervention group reported hurt worst pain on WBFS pre-intervention, it reduced to 8% after animated stories intervention was applied. This may be related to that distraction has the ability to separate the connection between child and his/her emotional pain that decreases the pain level and reflected the positive effects of animated stories intervention. Similarly, An Egyptian study carried out by **Mohamed (2018)** to evaluate the effect of selected distractors (paly materials) on the intensity of pain among 50 children undergoing painful procedures in the pediatric surgical ward concluded that more than half of children in the pediatric surgical ward experienced severe pain during painful procedure in the pretest, whereas more than two thirds of them saw in the post-test, reported reduced experienced pain level in the post-test.

These findings are similar to the result in a study conducted by **Aminabadi et al (2019)** reported that illustrated stories caused a significant reduced pain perception and situational anxiety during dental treatment and improved the children's interactions with the dentist. From the researchers' point of view, this result revealed the beneficial impact of the watching method as a distraction technique that helps in pain and anxiety reduction. Similarly, **Bellieni et al. (2018)**, who reported that, there was a reduction in the pain of I.V catheters in children of school-age using distraction methods. Also the results of the study of **Sinha et al. (2016)** who found that, the evaluation of non-pharmacologic technique of pain and anxiety management for laceration repair in the pediatric emergency department that distraction could minimize the pain of stitching in children under 10 years old.

The results of the current study revealed that a highly significant difference in the severity of pain on WBFS across animated stories intervention group and control group post intervention. From the researchers' point of view, it reflected the good impact of animated stories intervention on severity of pain reduction. On the other hand, these findings contradict those of **Bagnasco et al. (2016)**, who found no significant variations in mean pain levels in their research of distraction

tactics in children during venipuncture. In addition, **Samaneh et al. (2017)** who discovered that the difference in mean pain scores between the groups of the experiment after the injection was not significant in their study about the effects of distraction on physiologic indicators and pain intensity in children aged 3-6 having IV injection. This could be because children's attention was diverted by a distraction activity, and activation in the brain areas involved for anxiety and pain, such as the thalamus, insula, and anterior cingulated cortex, was reduced (**Martin, 2020**).

Conclusion:

According to the findings of the current study, animated stories intervention is an effective distraction technique for reducing preoperative anxiety and postoperative pain among children undergoing surgery compared to children in the control group who received only routine hospital care.

Recommendations:

In the light of the findings obtained from the current study, the following recommendations were suggested:

1. Nurses who care for children should use animated stories as non-pharmacological management in addition to standard hospital program for children having surgical procedures to minimize preoperative anxiety and postoperative pain levels.
2. Educating parents and nurses about the use of animated stories as a distraction method for children with anxiety and pain.
3. To generalize the findings, the current study has to be replicated with a larger sample of children undergoing surgical procedures in varied settings.
4. More study on the effect of combining various non-pharmacological strategies such as imagination with animated stories as a management for lowering anxiety and pain in children should be done.

References:

- Aminabadi NA, Vafaei A, Erfanparast L, Oskouei SG, and 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.B., Yüksel, S., Ergil, J., Polat, R., Akelma, F. K., Ekici, M., and Odabas, Ö. (2017):** The effect of play distraction
- Aytekin A, Doru Ö, Kucukoglu S. (2016) :** The effects of distraction on preoperative anxiety level in children. *J PeriAnesthesia Nurs.*;31(1):56–62. doi:10.1016/j.jopan.2014.11.016
- 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): 1015–7.
- Chow CH, Van Lieshout RJ, Schmidt LA, Dobson KG, Buckley N. (2015):** Systematic review: audiovisual interventions for reducing preoperative anxiety in children undergoing elective surgery. *J Pediatr Psychol*;41(2):182–203. doi:10.1093/jpepsy/jsv094
- Delvecchio E, Salcuni S, Lis A, Germani A and Riso D (2019):** Hospitalized Children: Anxiety, Coping Strategies, and Pretend Play. *Frontiers Public Health*; 7 (250). <https://doi.org/10.3389/fpubh.2019.00250>
- 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).
- El-Samman GA, Ahmed EM, Mohamed AS (2009):** The effect of play on reducing anxiety of hospitalization among school-age children. *Int Health, Rev J* 152–157.
- Garra G, Singer A, Taira B, Chohan J, Cardoz H, Chisena E, Thode H. (2010):** Validation of the Wong-Baker FACES Pain Rating Scale in pediatric emergency department patients. *Acad Emerg Med* Jan;17(1):50-4. doi: 10.1111/j.1553-2712.2009.00620.
- Gonçalves LL, Voos MC, Almeida M, and 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, Gh. (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, and Ozcengiz D. (2018):** Effects of auditory and audiovisual presentations on anxiety and behavioral changes in children undergoing elective surgery. *Niger J Clin Pract.*; 21(6):788–794. doi:10.4103/njcp.njcp_227_17.
- Hosseinpour M. and Ahmadi B. (2016):** Emergency Abdominal Surgery in Infants and Children. Submitted: November 18th 2015 Reviewed: April 13th 2016 Published: September 21st 2016. DOI: 10.5772/63649. Open access peer-reviewed chapter.
- Kain ZN, Caldwell-Andrews AA, and Mayes LC. (2017):** Family-centered preparation for surgery improves perioperative outcomes in ChildrenA randomized controlled trial. *Anesthesiol*; 106(1):65–74. Doi: 10.1097/0000542-200701000-00013.
- Kennedy R., Luhmann J., Zempsky T. (2018):** Clinical implications of unmanaged needle-insertion pain and distress in children. *Pediatrics*;122S:130–33.
- Ko Y.-C., Chou A-H, Wu C-F, Chen J., and Chen C-Yu (2021):** Using Guided Imagery to Relieve the Anxiety of Preschool Children Undergoing Dental Procedures. <https://doi.org/10.1016/j.jopan.2020.04.0071089-9472/©2020> American Society of PeriAnesthesia Nurses. Published by Elsevier, Inc. All rights reserved *Journal of PeriAnesthesia Nursing* 36 (2021) 18e23.
- Li J, Galley M, Brockett C, Gao J, and Dolan B. (2016):** A diversity-promoting objective function for neural conversation models. In *Proc. of NAACL-HLT*.
- Martin, A. (2020):** Measuring chemotherapy – induced nausea and emesis. *Cancer*, 98(6):645-655.
- Moghimian M, Akbari M, Moghaddasi J, and Niknajad R. (2019):** Effect of digital storytelling on anxiety in patients who are candidates for open-heart surgery. *J*

- Cardiovasc Nurs.; 34(3):231–235. doi:10.1097/JCN.0000000000000569.
- Mohamed SA (2018):** The effect of selected-distracters on intensity of pain and fear in children undergoing painful procedures. *Egypt J Nurs* 1:76–87.
- Moura L, Dias IMG, and Pereira LV. (2016):** Prevalence and factors associated with preoperative anxiety in children aged 5–12 years. *Rev Lat Am Enfermagem*; (24)1–7.
- Nisha K, and Umarani J (2019):** Effect of play intervention in the reduction of anxiety among preoperative children. *Int J Curr Res Rev* 5:104.
- Noronha JR, and Shanthi S (2015):** Effectiveness of picture book on preoperative anxiety among children (6–12 years) in selected hospitals at Mangalore. *Asian J Nurs Educ Res* 5:523–525.
- Perry JN, Hooper VD, and Masiongale J. (2019):** Reduction of preoperative anxiety in pediatric surgery patients using age-appropriate teaching interventions. *J PeriAnesthesia Nurs*; 27(2):69–81. doi:10.1016/j.jopan.
- Samaneh N., Chehrzad M., Abotalebi G., Atrkar Z. (2017):** Effects of Distraction on Physiologic Indices and Pain Intensity in children aged 3-6 undergoing IV Injection. *HAYAT*; 16 (3 and 4):39-47.
- Sekhvatpour Z., Khanjani N., Reyhani T., Ghaffari S., and 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: 61–68. Published online Jul 11. doi: 10.2147/PHMT.S201653. PMID: PMC6628943. PMID: 31372090.
- Shapiro L , Brown K, Thoresen C, Plante G. (2011):** The moderation of Mindfulness-based stress reduction effects by trait mindfulness: *Epub*, 67(3):267-77.
- Sinha M, Christopher NC, Fenn R, Reeves L. (2016):** Evaluation of nonpharmacologic 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 anxiety: Is sedation and distraction better than either alone? A prospective randomized study. *Paediatr Anaesth*; (34) 27:827–. <https://doi.org/10.1111/pan.13180>.
- Spielberger, C. D. (1970):** Manual for the state-trait anxiety inventory (Self-evaluation questionnaire). Consulting Psychologists Press.
- Srouji R., & Ratnapalan S. (2017):** Pain in Children: Assessment and Nonpharmacological Management. *Int JPediatr*: 11–12.
- Tork H M (2017):** Comparison of the Effectiveness of Buzzy, Distracting Cards and Balloon Inflating on Mitigating Pain and Anxiety During Venipuncture in a Pediatric Emergency Department. *American Journal of Nursing Science* Volume 6, Issue 1, February, Pages: 26-32 Received: Dec. 16, 2016; Accepted: Dec. 26, 2016; Published: Jan. 20, 2017
- Wong, D., & Baker C. (1988):** Pain in children: comparison of assessment scales, *Pediatric Nursing*, 14(1):9-17.
- Zarei Kh, Parandeh Motlagh Z, Seyedfatemi N, Khoshbakht F, Haghani H, and 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.