

## Effect of Storytelling Versus Cartoon on Pain and Fear Relief among Children Undergoing Venipuncture

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### Abstract

**Background:** Pain and fear may be experienced by children who are subjected to uncomfortable procedures. Pain management is an important topic to explore, as is how distraction techniques can be utilized to divert children's attention away from uncomfortable stimuli during painful procedures. **This study was aimed to** evaluate the effect of storytelling versus cartoon on pain and fear relief among children undergoing venipuncture. **Design:** The current study used a quasi-experimental research design. **Setting:** the current study was conducted in Surgical Pediatric Department at Beni-Suef University Hospital. **Subjects:** 120 preschool-age children selected through the purposive sampling method were equally and randomly assigned into three groups, (40 children in the storytelling group, 40 children in cartoon group, and 40 children in the control group who received routine hospital care). **Tools:** Four tools were used as the following: I-A structured interviewing questionnaire, II-Numeric Rating Scale (NRS), III-Wong-Baker FACES Pain Rating Scale, and IV-Children's Fear Scale were used for collecting data. **Results:** In the cartoon group, children having the lowest mean pain (2.3+1.2). About one-third of children had moderate pain, more than half of the children remained relaxed, with statistical significance differences of (0.001\*). More than half of children in the cartoon group reporting no pain on WBFS. The children in the cartoon group (1.2+0.5) had lower mean ratings for fear. **Conclusion:** Cartoon was an effective method for reducing and relieving pain and fear among children during venipuncture more than the storytelling method. Control group who received the routine work of the hospital only, their pain and fair still high. **Recommendations:** Application of the storytelling and cartoon distraction techniques besides routine hospital programs during intravenous injection is recommended in the care of children to reduce pain and fear related to intravenous injection.

**Keywords:** Cartoon, Children undergoing venipuncture, Pain and Fear Relief Storytelling.

### Introduction

Pain is one of the most common health problems in children, and its occurrence under abnormal physiological conditions is thought to be the body's most significant protection mechanism. Because assessing pain in children can be difficult, a variety of age-specific pain treatment instruments and ratings have been developed (Srouji and Ratnapalan, 2017).

In children, intravenous injections are a common source of pain. Many children, in addition to suffering pain during venipuncture, also experience fear before operations, which can heighten a child's pain perception and anxiety, resulting in a negative experience. Because pain can have several detrimental

long-term implications, alleviation of pain and suffering is an important obligation of nurses caring for children (Kennedy et al., 2018).

Visual distraction (counting things, watching TV), verbal distraction (listening to music), touch-motion distraction (slow regular breathing), and purposeful distraction are all examples of distraction tactics (using toys). Relaxation, hypnosis, modeling, desensitization, contingency management, selective attention, watching cartoons, stress inoculation, cognitive restructuring, and coping skills training are some of the other approaches (Hatipoglu, et al., 2018). Purposive distraction (using toys as bubbles) and audio-visual distraction are the most effective distraction tactics utilized in school (Sng, et al. 2019).

Distraction is a simple yet efficient method of diverting a child's attention away from unpleasant stimuli. Distraction, on the other hand, is related to a variety of strategies and technologies. This treatment is far less expensive than pharmacological therapy and has fewer adverse effects. Non-pharmacological pain treatment methods have been proposed in several ways. The impact of cartoon animation on 20 children and discovered that there was a significant difference between the experimental and control groups (**Khngoshra et al., 2017**).

Audio-visual distraction, such as cartoon distraction, is a simple strategy that helps nurses handle the problem of lack of attention to pain management by passively redirecting the subject's attention or activities involving the subject in the performance of a diversion activity (**Bagheriyan, et al., 2018**). Cartoon distraction can jog emotions and break the connection between a person and his or her emotional pain by directing attention away from one's pain and focusing on concern for others, more positive thoughts, and distracting with other sensations, i.e. cartoon distraction can jog emotions and break the connection between a person and his or her emotional pain (**Kaheni et al. 2016**).

Distraction techniques are frequently provided by nurses, parents, or child life specialists to aid in pain relief during procedures, and it is the responsibility of health care professionals to reduce such pain and fear to the greatest extent possible while maintaining child safety through the use of various pharmacological and non-pharmacological interventions (**Lee and Yeo, 2013**). 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**).

As a result, one of the most important nursing tasks is to reduce child worry. Preparing children physically, emotionally, and cognitively before performing care procedures, as well as listening to brief stories, are helpful techniques used with preschool children to alleviate fear (**Academy for Guided Imagery, 2019**). Meanwhile, storytelling and cartoon can

help children feel less pain and fear since it is enjoyable for them, meets their cognitive, growth, and mental development needs, and creates a happy environment (**Tunney and Boore, 2020**).

#### Significance of the study:

For children, venipuncture is one of the most frightening procedures, and 50% to 75% experiencing significant fear and pain before this procedure. Pain relief for children is not only an ethical obligation, but it also prevents short- and long-term negative consequences (**Carbajal, 2018**). Caring for a child who is in pain can put a family's emotional and financial well-being at risk (**Twycross and Finley, 2019**). Children remember the pain and may avoid future medical care as a result of painful experiences in a hospital or clinic. This can result in dilated pupils, sweating, increased heart rate, increased blood pressure, and skin rash, which, if not treated promptly, can lead to chronic problems and even death. **Chow et al (2015)** demonstrated the effectiveness of audiovisual interventions in reducing fear and pain in children undergoing elective surgery, and **Aminabadi et al (2017)** shown that visual storytelling reduced pain and fear in children visiting the dentist.

#### Aim of the study:

To evaluate the effect of storytelling versus cartoon on pain and fear relief among children undergoing venipuncture through:

- Assess pain level among children undergoing venipuncture.
- Assess fear level among children undergoing venipuncture.
- Evaluate the effect of storytelling versus cartoon on pain and fear relief among children undergoing venipuncture

#### Research hypothesis:

- Children who will be received distraction methods as storytelling or cartoon will experience less than mean scores of pain and fearless than those not exposed to distractions.

#### Subjects and methods:

##### Research design:

The current study used a quasi-

experimental research design, in which patients self-select or are selected into one of some different treatment groups to compare the real effectiveness and safety of non-randomized treatments (Maciejewski, 2020).

### Setting:

The current study was conducted in Surgical Pediatric Department at Beni-Suef University Hospital. This setting was chosen because they have a high frequency of patients and serve the country's most populous region.

### Subjects:

120 preschool-age children were selected through purposive sampling method, were equally and randomly assigned into three groups, (40 children in storytelling group, 40 children in cartoon group, and 40 children in control group who received routine hospital care).

### Inclusion criteria included:

- (1) Children aged from 3 to 6 years.
- (2) All the children were scheduled for injection.
- (3) Co-operative children.
- (4) Conscious children.

### Exclusion criteria included:

- 1- Child under effect of any sedative/ anticonvulsant/ analgesic drug.

### Tools of data collection:

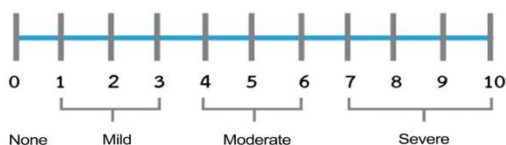
#### Four tools were used as the following:

**Tool (I): A structured interview questionnaire** was developed by the researchers after reviewing the related literature and research studies; it consists of 7 items categorized into two parts.

**Part (1):** It consisted of three items related to the demographic characteristics of children, including gender, age, and residence.

**Part (2):** It included 4 items related to medical data of children such as diagnosis, duration of hospitalization, previous hospitalization, and having chronic disease.

**Tool - II: Numeric Rating Scale (NRS),** The NRS for pain is an 11-point numeric rating scale, with 0 representing "no pain" and 10 "unbearable pain (John, et al., 2008).



**Tool - III: Wong-Baker FACES Pain Rating Scale,** used to assess the effectiveness of cartoon and bubbles in pain response among children. It consists of 6 points with a total score of 10. It was used to depict pain perception in children. The scale shows a series of faces ranging from a happy face at 0, "No hurt" to a crying face at 10 "Hurts worst" with the maximum score as 10 and minimum as 0 categorized as 0 – No Hurts, 2– Hurts Little Bit, 4 – Hurts Little More, 6 – Hurts, Even More, 8 – Hurts Whole Lot and 10 – Hurts Worst. The researcher chose the face that best described how a child feels during intravenous injection (Wong, and Baker, 1988).



**Tool - IV: Children's Fear Scale (CFS) (McMurtry et al., 2011),** consists of five faces representing varying degrees of fear. The researcher selects the face that represents how feels and the ordered faces are scored from 0 to 4.



### Validity of the tools:

The content validity of the tools, their clarity, comprehensiveness, appropriateness, and relevance was reviewed by five experts' professors; two experts in medical-pediatric, three experts in the pediatric nursing field. Modifications were made according to the panel judgment to ensure sentence clarity and content appropriateness.

### Tool reliability:

- The questionnaire was tested for its validity where its value was 92.0%, Reliability was estimated by Alpha Cronbach's test for the tool and its result was 0.84.

- Numeric Rating Scale (NRS), reliability analysis found an interclass correlation coefficient of 0.83 ( $P < 0.001$ ) (John, et al., 2008).
- 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).
- Children's Fear Scale, The CFS has shown good evidence of test-retest ( $r_s = 0.76$ ,  $p < 0.001$ ) and inter-rater ( $r_s = 0.51$ ,  $p < 0.001$ ) reliability as well as construct validity among children (McMurtry et al., 2011).

#### Pilot study:

A pilot study was carried out before starting data collection including 10% of the study sample (12 children) for the purpose to test the clarity, completeness and determine the time involvement. According to the results of the pilot study, the needed modifications, omissions, and/or additions were done. Children included in the pilot study were excluded from the study.

#### Methods for data collection:

Before starting this study, administrative approval was taken from authorities in the previously selected settings. After obtaining oral permission from the children for collecting data, the children were interviewed by the researchers where the full explanation of each tool was given. Data collection was conducted from July to December 2020. The interview was conducted two days through the week from 9 Am -1 Pm. The tools took about 50-60 minutes to be completed.

#### Fieldwork:

The study required administrative consent from the setting's authorities before it could begin. 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.

Questionnaires were distributed to 120 children, were equally and randomly assigned to three groups, storytelling group 40 children, cartoon group 40 children, and the control group, 40 children who received only the routine care of the hospital. Data collection was done during the routine work of the hospital.

The control group participants have received routine care as evaluation of the physical health, administration of prophylactic medications. The evaluation was done regarding pain and fear during intravenous injection of children by faces, pain scale, numeric rating scale, and children fear scale.

In the control group, the researchers interviewed each child individually for about 40 minutes; the researchers explained the aim of this study as well as oral consent was obtained from them then demographic data, and they were received the routine hospital care only.

Storytelling for the intervention group included two phases story, the first phase includes telling a story that took about twenty minutes by using a fun and educational story type, which consisting of pages with colorful and attractive graphics and one line or one sentence per page while telling the story and make the child repeat it. The second phase includes a discussion about the story with the child.

Cartoon was administered, through researchers' laptops during the painful procedure of intravenous injection, and continued throughout the procedure during which pain was assessed by using the Wong Bakers FACE pain rating scale, numeric rating scale, and children fear the scale.

The researcher scored the scale by observing children's behavior during venipuncture. After injection, children's pain was assessed by numerical pain scale, this scale was showed to the children and they were asked to choose their pain from numbers 0 to 10, Wong Bakers FACE pain rating scale, this scale was showed to the children and they were asked to choose their pain from numbers 0 to 10 and Children's Fear Scale (CFS) this scale was showed to the children and they were

asked to choose their pain from numbers 0 to 4.

#### Ethical considerations:

Before the research started, Approval of the Ethical Research Committee of the Faculty of Nursing was obtained before conducting the study. Informed consent was obtained from the mothers of children after the aim of the study was explained to the mothers and their children. The researcher informed the children that, the study was voluntary, they were allowed to not participate and they had the right to withdraw from the study at any time. Moreover, they were assured that their information would be confidential and used for research purposes only.

#### Administrative design:

Administrative permission was obtained through an issued letter from the Dean of Faculty of Nursing, Beni-Suef University to the Directors of the Surgical Pediatric Department at Beni-Suef University Hospital to achieve this study.

#### Statistical analysis:

Data collected and analyzed by computer program SPSS" ver. 21" Chicago. The USA. Categorical variables were described by number and percent, where continuous variables were described by the mean and standard deviation (Mean, SD). A person's correlation is used to determine significance between variables in the same group. Significance is considered when  $P < 0.05$  while  $P > 0.05$  is considered not significant.

#### Results:

**Table 1:** Revealed that in the control group (60%) were girls and (40%) were boys, in the storytelling group (35%) were girls and (65%) boys, and in the cartoon group (57%) were girls and (43%) boys, with the mean age of the control group being (3.8+1.2) years, in the storytelling group (3.2+2.5) years, and the cartoon group (4.2+1.3) years. Children in the control group, storytelling group, and cartoon group all lived in urban regions (45 percent),

(40 percent), and (55 percent) respectively.

**Table (2)** represented that most (90%, 80%, and 75%) of studied children were had no previous hospitalization in controls, storytelling, and cartoon groups respectively. Concerning having chronic disease, (75%, 65%, and 77%) had no chronic disease in controls, storytelling, and cartoon groups respectively. Regarding diagnosis, it was found that (73%, 67%, 68%) of the studied children in controls, storytelling, and cartoon groups respectively, the same table, reflected that (76%, 66%, and 64%) of studied children in controls, storytelling, and cartoon groups respectively.

**Table (3)** Showed that a highly significant difference was found in mean pain scores on numeric rating scales across the control, storytelling, and cartoon groups, scores with the cartoon group having the lowest mean pain (2.3+1.2).

**Table (4)** Demonstrated that during venipuncture, the majority of the control group (92%) had severe pain, 8% experienced moderate pain, and none remained relaxed, but in the storytelling group (45%) had moderate pain, (35%) remained relaxed, and only 20% had severe pain. Whereas in the cartoon group, 35% had moderate pain, 55% remained relaxed, and just 10% had severe pain, with statistical significance differences of (0.001\*).

**Table (5)** Revealed that there was a highly significant difference in the severity of pain on WBFS across controls, storytelling, and cartoon groups, with (65.8%) of children in the cartoon group reporting no pain on WBFS.

According to **Table (6)**, the control, storytelling, and cartoon groups had a highly significant difference in children's fear scales. The children in the cartoon group (1.2+0.5) had lower mean ratings for fear.

**Table (1):** Distribution of demographic characteristics of the children between the control, storytelling, and cartoon groups (n=120)

Demographic characteristics	Control (n=40)		Storytelling (n=40)		Cartoon (n=40)	
	No.	%	No.	%	No.	%
<b>1- Gender</b>						
Boys	16	40	26	65	17	43
Girls	24	60	14	35	23	57
<b>2- Age</b>						
Mean $\pm$ SD age	3.8+1.2		3.2+2.5		4.2+1.3	
<b>4- Residence</b>						
Urban	18	45	16	40	22	55
Rural	22	55	24	60	18	45

**Table (2):** Distribution of children according to their medical history (n=120)

Items	Cartoon (n=40)	Storytelling (n=40)	Control (n=40)
	No (%)	No (%)	No (%)
<b>Previous hospitalization:</b>			
• Yes	10.0	20.0	25.0
• No	90.0	80.0	75.0
<b>Having chronic disease:</b>			
• Yes	25.0	35.0	23.0
• No	75.0	65.0	77.0
<b>Diagnosis</b>			
• Tonsillectomy	73	67.0	68.0
• Appendectomy	27	32.0	32.0
• Others	0	1.0	0
<b>Duration of hospitalization (day)</b>			
• < 3 days	76.0	66.0	64.0
• 3 days and more	24.0	34.0	36.0

**Table (3):** Comparison of mean scores of pain on NRS between the control, storytelling, and cartoon groups (n=120)

Items	Control (n=40)	Storytelling (n=40)	Cartoon (n=40)	P-value
Mean Scores of Pain on NRS	6.3+1.2	4.1+1.3	2.3+1.2	0.000*

**Table 4:** Comparison of pain numeric rating scale between the control, storytelling, and cartoon groups (n=120)

Items	Control (n=40)		Storytelling (n=40)		Cartoon (n=40)		p-value
	No.	%	No.	%	No.	%	
<b>Numeric rating scale</b>							
<b>Relaxed</b>	0	0.0	14	35	22	55	0.001*
<b>Moderate pain</b>	3	8	18	45	14	35	
<b>Severe pain</b>	37	92	8	20	4	10	

**Table 5:** Comparison of the intensity of pain on WBFS between the control, storytelling, and cartoon groups (n=120)

Items	Control (n=40)		Storytelling (n=40)		Cartoon (n=40)		p-value	
	No.	%	No.	%	No.	%		
<b>The intensity of Pain on WBFS</b>	No hurt	4	10	6	15	27	65.8	0.001*
	Hurts Little Bit	2	5	4	10	6	15	
	Hurts Little More	5	13	7	17	2	6	
	Hurts Even More	4	10	2	6	2	6	
	Hurts Whole Lot	9	22	11	27	1	2.2	
	Hurts Worst	16	40	10	25	2	5	

**Table (6):** Comparison of mean scores of pain on children fear scale between the control, storytelling, and cartoon groups

Items	Control (n=40)	Storytelling (n=40)	Cartoon (n=40)	p-value
Mean Scores of children fear	2.2±1.3	1.2±1.3	1.2±0.5	0.000*

### Discussion:

The most effective method for reducing pain and fear during medical procedures is to use storytelling and cartoon distraction techniques (**Donna and Ran, 2018**). So, that the study was aimed to evaluate the effect of storytelling versus cartoon on pain and fear relief among children undergoing venipuncture.

The finding of the present study indicated that a significant difference was found in mean pain scores on numeric rating scales across the study groups and the cartoon group had a little mean score of pain. From the researchers' point of view, this result reflects the positive effect of the cartoon watching method as a distraction technique that helps in reducing pain and fear. These findings are similar to the result in a study conducted by **Samaneh et al., (2017)** entitled "Effects of Distraction on Physiologic Indices and Pain Intensity in children aged 3-6 undergoing IV Injection" and also reported that a significant difference in the mean pain scores based on a numeric scale between the control group and other groups after the injection.

The results of the current study revealed that one percent only of the studied children had severe pain, with statistical significance differences. This may be related to the effectiveness of the cartoon technique in reducing the concentration of the children undergoing venipuncture.

The results of the current study revealed that a highly significant difference in the severity of pain on WBFS across controls, storytelling, and cartoon groups, with about two-thirds of children in the cartoon group reporting no pain on WBFS. From the researchers' point of view, it reflected the good impact of storytelling, and cartoon applications.

This result is matched with the study conducted by **McLaren & Cohen, (2005)** who studied and compare the distraction strategies for venipuncture distress in children and

reported that children in the movie condition were significantly less distressed than children in the control condition ( $p < .001$ ) and observed that a cartoon movie decreased pain and distress in children during the injection.

**Similary, Bellieni et al. (2018)**, who studied "Analgesic effect of watching TV during venipuncture" and reported that, there was a reduction in the pain of catheters in children of school-age using distraction methods. Also the results of the study of **Sinha et al. (2016)** found in their study about the evaluation of non-pharmacologic methods of pain and anxiety management for laceration repair in the pediatric emergency department pediatrics that distraction could reduce the pain of stitching in children under 10 years old.

The current study's goals and hypotheses were validated by these findings. These findings are consistent with those of **Esmaili et al., (2017)**, who discovered that bubble-making significantly reduced children's pain during the administration of blood vessels in their study comparing the efficacy of breathing exercises and music to reduce pain during the administration of blood vessels. The findings were consistent with those of **Alavi et al. (2018)**, who found that, as compared to the typical way, bubble-making during an injection can lessen children's pain in their study of pediatric pain treatment by nurses in Shahrekord educational hospitals.

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)** 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.

In the current study, the children in the cartoon group (1.2+0.5) had lower mean ratings for fear which may be related to that, distraction can separate the connection between a person and his/her emotional pain that decreases the fear level.

These findings are supported by a study conducted by (Pandani, 2017) to evaluate cartoon movie viewing as a practical and low-cost intervention to reduce burned children's pain behavior during dressing changes, which discovered that cartoon movie distraction had a significant effect on observed behavioral distress in children.

Similarly, Mohamed (2015) conducted an Egyptian study to evaluate the effect of selected distractors on the intensity of pain and fear in 50 children undergoing painful procedures in the pediatric surgical ward and found that more than half of the children in the pediatric surgical ward experienced severe fear during painful procedures in the pretest, and more than two-thirds of them saw fear during painful procedures in the posttest.

This could be because children's attention was diverted by a distraction activity, and activation in the brain areas involved for pain and fear, such as the thalamus, insula, and anterior cingulate cortex, was reduced (Martin, 2018).

### Conclusion:

Based on the results of the present study, it was concluded that children who were exposed to cartoon had experienced low pain and fear scores compared to children in the storytelling and control group who received routine hospital care only. The cartoon was an effective method for reducing and relieving pain and fear among children during venipuncture more than the storytelling method.

### Recommendations:

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

- Application of the storytelling and cartoon distraction techniques besides routine hospital programs during intravenous injection is recommended in the care of

children to reduce pain and fear related to intravenous injection.

- Parents' education and nurses about storytelling and cartoon as distraction techniques for reducing pain and fear among children.
- Replication of the current study with a larger sample of children undergoing venipuncture in different settings is required for generalizing the results.

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