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Effect of Watching Animated Cartoon Film on Level of Pain during Venipuncture among Children Admitted in Ministry Hospital Ras Al Khaimah

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ABSTRACT

Introduction: Venipuncture is one of the commonest painful stimuli children are exposed during hospitalization. Improper management of pain has long lasting effect on psychosocial behavior of children. Many non-pharmacological methods are useful in minimizing procedural pain.

Objective: To assess the effect of distraction in form of animated cartoon film on level of pain among hospitalized children during venipuncture.

Methodology: Study was conducted among sixty children between 3-10 years of age by using Quasi-experimental posttest only control group design. FLACC or Wong Baker Scale was used for the assessment of pain during venipuncture as per the age of the child. Animated cartoon film in Arabic or English depending on the child's interest, were used as an intervention. It was started five minutes prior to venipuncture and results were documented immediately after the procedure.

Results: Majority (66.6%) of the children were between age group of 3-6 years and had (70%) history of previous experience in venipuncture procedure. Distraction in form of cartoon film during venipuncture had shown statistically significant reduction in level of pain among study group.

Conclusion: Acute pain associated with venipuncture is an unavoidable traumatic experience for the hospitalized children. If not managed appropriately can lead to a long-lasting effect on the psychosocial behavior of the children. Animated cartoon film is an effective and user-friendly method that is well accepted by children and can be implemented by nursing personnel independently.

Key Words: Distraction, Pain, Animated Cartoon, Venipuncture, Effect, FLACC, Wong Baker

INTRODUCTION

Pain is a spiteful sensation associated with or approaching the actual or potential tissue damage.¹ Pain sensation is a complex of all stimuli, which depends on age, cognitive development, and ability to express the pain severity in any individual. It is a common observation that all individuals during their childhood are exposed to painful stimuli right from birth in form of immunization and thereafter for diagnostic or therapeutic purposes if hospitalized.

Venipuncture is one of the commonest procedures which children usually get encounter, during hospitalization.² This

procedure was associated with fear of mutilation among children between 3-12 years of age.³ Though it is a fundamental right of every child to receive appropriate preparation and intervention to reduce pain during venipuncture⁴, it is not usually practiced as a routine.^{2,5} For instance, when the frequency of painful stimuli and interventions adopted to minimize level of pain was assessed among 2987 hospitalized children, only 844 (28.3%) receive pain management interventions specifically for the painful procedure.²

Fear of needle is a common phenomenon observed in children, which plays an important role in the experience of pain.⁶ It was evident from findings reported by parents

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while witnessing the invasive procedure for their children. The level of fear scored higher than pain level among the children following application of EMLA cream during insertion of a needle in to subcutaneously implanted intravenous port. It was also suggested that along with anesthetic cream additional intervention, which will distract the attention from painful stimuli, should be used to minimize fear in children.⁷

In the process of atraumatic care, lots of non-pharmacological strategies have been used by health care professionals to decrease procedural pain in children such as the use of distraction cards and kaleidoscope, video games (Canbulat, Inal & Sönmez, 2014)⁸, Dolls and puppets (Silva et al., 2016).⁹

Cartoon film was used by Susan et.al to distract the attention of children aged between 4-6 years old during venipuncture. A significant difference in pain score was observed in the study (6.63 ± 0.80) and control (9.43 ± 0.62) groups at $p < 0.05$.¹⁰

Distraction helps in diverting the attention of the child from noxious stimuli to something pleasant. According to the systematic review accomplished by Uman et al., (2013)⁷ 3394 children from 39 studies mentioned that distraction was effective in pain reduction that inherent with needle prick. Moreover, it also minimizes the chances of remembering the painful experience associated with invasive procedures which may protect the child from the development of negatively exaggerated memory.¹¹

Pursuant to Gate control theory thoughts or emotions influences the perception of pain. If an individual is kept engaged in the activity he/she likes, the severity of perception of pain is reduced. It was observed that when an individual is distracted during painful stimuli, an increase in activation of the affective division of the anterior cingulate cortex (ACC) and the orbitofrontal region of the brain takes place. In contrast to this action reduction in many areas of the pain matrix i.e. thalamus, insula cognitive division of the ACC was observed which might be the contributing factor in reducing pain perception in any individual.¹²

In view of this literature review and as a clinical nurse working in pediatric unit researcher observed that most of the children admitted in the unit needs venipuncture for therapeutic or diagnostic purpose. It is always challenging to gain cooperation from the children and complete the procedure with minimal pain and time. It was also observed that children enjoy watching cartoons available on TV provided in their room and forget the discomfort associated with hospitalization. It prompted the researcher to assess the effectiveness of showing cartoon film on pain during venipuncture. This type of intervention was not used during venipuncture for children in selected clinical area Therefore, in present study researcher used age appropriate cartoon film during

venipuncture to assess its usefulness in minimizing level of procedural pain.

OBJECTIVE

To assess effect of distraction in form of animated cartoon film on level of pain among hospitalized children during venipuncture.

MATERIALS AND METHODS

Research design

Quasi-experimental post-test only control group design was used in the study.

Setting

Study was conducted in pediatric unit of Government hospital, which comes under Ministry of Health and prevention U.A.E. This unit caters to all health care needs of the children.

Sampling and sample size

Subjects were recruited to either study or control group equally by using random method. Every second child was assigned to control group. Total sixty children participated in the study. Data was collected in the procedure room of the unit. Children between 3-10 years of age, stable, without any complications, not receiving any analgesics were selected for the study. Children who were critically ill and receive more than two pricks during venipuncture were excluded from the study.

Ethical consideration:

Approval was obtained from Institutional and Regional Ethical Committee (MOHAP/REC/2019/9-2019-PG-N). Informed consent from the parents and verbal assent from the children was taken before implementation of the intervention and after explaining purpose of the study to the parents and the children.

Instrument:

For the current study as per the hospital policy FLACC scale¹³, was used for the children between 3-6 years and Wong Baker pain scale¹⁴ was used for the children between 7-10 years. Scoring for the FLACC scale was categorized as 1-3 mild, 4-6 moderate and score between 7-10 as severe. Pain score on Wong Baker scale was scored as 0- no pain, 2 - mild, 4 and 6 moderate, 8 and 10 severe pain.¹⁵

Data collection procedure:

After receiving approval from the Ethical Committee and

the authority of selected hospital parents of the children fulfilling inclusion criteria were approached. Nursing personnel involved in the procedure were informed about the intervention. Parents were present throughout the procedure with the child belonging to both study and control groups. Distraction in form of video on animated Cartoon film was initiated five minutes prior to the procedure for the study group and continued throughout the procedure. The Control group received routine care, which includes information about the procedure to the parents and child. The level of pain was assessed by using FLACC Pain Scale or Wong-Baker Scale soon after the puncture of the vein. The children who required more than two pricks were not included in the study however; intervention was continued until completion of the venipuncture. Children in which Wong Baker scale was used were asked to denote the face as per their experience of pain. The observation was documented immediately after the procedure. The same observation was carried out for children from the control group without intervention. Data was collected from March 2019 to July 2019.

RESULTS

Table 1: Demographic Characteristics of all subjects (n= 60)

	Number	Percentage
Age		
3-6 years	40	66.66
7-10 years	20	33.33
Gender		
Male	42	70.0
Female	18	30.0
Educational Status		
Pre-school	24	40.0
School age	36	60.0
Nationality		
Local	45	75.0
Non-Local	15	25.0
Previous experience of I.V. cannulation		
Yes	42	70.0
No	18	30.0

As per the data presented in Table 1 more than half of children were male (70%) and between age of 3-6 years. 75% were Emiratis and 70% had previous experience of venipuncture.

Table 2: Comparison of level of pain among study and control group.

Group	Mild		Moderate		Severe	
	N	%	N	%	N	%
Study (n = 30)	20	66.66	10	33.33	0	0
Control (n = 30)	0	0	18	60	12	40

Data presented in Table 2 shows that, more than two third of the study group have mild pain, while 60 % of the control group have moderate, and 40 % of them have severe pain.

Table 3: Comparison of pain score between experimental and control group

Group	Sample	Mean	SD	T	p Value
Study	30	1.7	0.78	-5.5151	< 0.000
Control	30	3.03	1.066		

Table 4: Age group wise comparison of pain score among children between study and control group (3-6 years)

Group	N	Mean	SD	Df	T value	Sig.
Study	18	1.27	0.46	39	-8.486	.0000
Control	23	2.56	0.50			

Table 5: Age group wise comparison of pain score among children between study and control group (7-10 years)

Group	N	Mean	SD	Df	T value	Sig.
Study	12	2.33	0.77	17	-5.567	.0000
Control	7	4.57	0.97			

Findings presented in Table 3, 4 and 5 indicates significant difference in mean score of pain between samples belonging to study and control group as evidence by $p < .05$

Table 6: Association between level of pain and selected demographic variables during venipuncture in study and control groups. (Fischer's Exact Test)

Demographic Variable		Study Group			p-Value	Control Group			p-Value
		Mild	Moderate	Severe		Mild	Moderate	Severe	
Age (Years)	3-6	10	8	0	0.23	0	11	12	0.02
	7-10	10	2	0		0	7	0	
Gender	Male	16	8	0	0.63	0	13	5	0.13
	Female	5	1	0		0	5	7	
Previous experience of venipuncture	Yes	14	5	0	0.68	0	11	8	0.46
	No	7	4	0		0	8	3	

As per the findings presented in Table No. 6 significant association was observed only between level of pain and age of the children belonging to control group. Other demographic variables i.e. gender and previous experience of venipuncture has not shown any statistically significant association at $p < .05$ in the study and control group.

DISCUSSION

Hospitalization during childhood is a very distressing and unhappy event in the life of children¹⁵ Along with change in routine, restrictions on movement, strange environment and exposure to unexpected needle pricks have shown long lasting behavioral problems in children. During their stay, most of the children have to undergo venipuncture, which exposes them to acute pain.^{16,17} Therefore, appropriate management of pain becomes an important and challenging responsibility of nursing personnel. Many pharmacological and non-pharmacological interventions have shown their efficacy in minimizing the perception of pain. In the present study age-appropriate and preferred cartoon, the film was used during venipuncture for the children in the study group.

Sixty children participated in the study. All of them underwent venipuncture for therapeutic purpose. Among these children, the majority were male and between 3-6 years old. It was also observed that most (70%) of them had previous experience of exposure to invasive procedures in form of venipuncture. Similar findings were observed in the study conducted by Akgül et al. (2018)¹⁸, Abd El SM and Elsayed (2015)¹⁷ where the majority of children were male and having previous experience of venipuncture. It suggests the need to further investigate the factors associated with sickness and hospitalization among male children.

The findings of the present study revealed that the use of cartoon film during venipuncture was effective in reducing pain as evidence by the significant difference in pain score ($p < 0.05$) was observed between the children belonging to the study and control group. A significant difference was also

observed in the level of pain between the study and control groups as evidence by the majority of children from the study group experienced mild (66.66%) to moderate pain (33.33%) during venipuncture whereas in the control group 60% of children experienced moderate and 40 % had severe pain. This effect may be due to diversion in attention from noxious stimuli in the study group, which has led to decreased activation of pain matrix resulting in a reduction of perception of pain¹⁹.

The findings of the present study are also supported by the study performed by Debra K Creedy Debra K (2016)²⁰ where the researcher examined the effect of distraction on behavioral distress related to venipuncture procedures in Taiwanese children aged 3 to 7 years. Using concealed randomization, eligible children were allocated to receive a picture book ($n = 92$), or animated cartoon ($n = 92$) compared with routine oral instructions ($n = 92$), when being injected with an intravenous cannula. All children experienced distress during needle insertion, but distress was less in the distraction-based intervention groups. This intervention was more effective for children aged 4 to 5 years.

Providing age-appropriate care is an important responsibility of a pediatric nurse. During hospitalization fear of pain, bodily injury, and loss of control are observed among preschoolers and school-age children. Therefore, it is advisable to involve the child in planning and providing care for them and also giving choices wherever possible and within agreeable limits. In the present study, selection of cartoon film was done as per the age and choice of every child. It must have created a feeling of self-control, which was evident from the cooperation received by the children during venipuncture.²¹ The use of EMLA cream is usually recommended in minimizing procedural pain. It has its own benefits however, distraction in form of asking questions related to various relevant topics during computer tomography or Nuclear magnetic resonance with a contrast among the samples has shown a significant decrease in pain score (0.69) ($SD \pm 1.26$) as compared to the participants who received an application of EMLA (1.86) ($SD \pm 1.73$)²² during peripheral venous cath-

eterization. The findings of the present study also strongly support the usefulness of cartoon film in diverting attention which is non-pharmacological, cost-effective, and moreover, can be implemented by nursing professionals independently.

Play is an important part of a child's life. Advancement in technology has made significant changes in the type of play activities preferred by children. One of the commonest (80%) activity children enjoy is watching cartoon films.²³ There are many beneficial effects of watching cartoon films. It is cost-effective, can be tailored as per the age and interest of the child, is easily available, and most important is, it makes the child laugh. Laughter helps in reducing stress, inducing natural painkillers, and increasing pain threshold.²⁴ Findings of the present study support these beneficial effects as evidence by the reduction in the level of pain among children belonging to the study group.

Association between the level of pain and selected demographic variables like age, gender, and previous experience with venipuncture was assessed in the present study. No significant association was observed in both groups related to demographic variables like gender and previous experience of venipuncture. However, association was observed between age and level of pain among children belonging to control group. Similar findings were observed in most of the studies for example study conducted by Shaker & Taha (2018)²⁵. Bergomi et al., (2018)²⁶ it indicates that intensity of pain is not influenced by gender, and previous experience of venipuncture among children.

CONCLUSION

Acute pain associated with venipuncture is an unavoidable traumatic experience for the hospitalized children. If not managed appropriately can lead to a long-lasting effect on the psychosocial behavior of the children. Animated cartoon film is an effective and user-friendly method that is well accepted by children and can be implemented by nursing personnel independently.

Scope of the study: Findings of the study have implications in nursing practice. The use of cartoon film to divert the attention of children during a painful procedure is a practical, simple and effective solution to minimize pain and gain cooperation from them. Standard protocol can be prepared to use age-appropriate cartoon films during venipuncture. Assessment of pain in hospitalized children is performed by nursing personnel as a routine, however, it is not usually done during painful procedures. Hence, assessment and management of procedural pain must be made as a standard policy in the pediatric unit. The findings of this study not only indicate a beneficial effect of cartoon film on the level of pain but also strongly recommends the assessment of pain with the age-appropriate tool during an invasive procedure.

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Authors' Contributions:

Safiya U.K¹.: Principle investigator and preparation of manuscript.

Sneha Pitre²: Supervision and overall preparation of manuscript

Eman Abdelaziz Ahmed Rashad Dabou³: Analysis and preparation of manuscript

Shukri Adam⁴: Methodology and preparation of manuscript.

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