IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 7, Issue 6 Ver. III. (Nov.-Dec.2018), PP 70-81
www.iosrjournals.org

Effect of Active versus Passive Distraction Technique on Controlling Pain Associated with Invasive Nursing Procedures among School Aged Children

Zeinab Elsayed Hafez Elsayed [1], Rahma Soliman Bahgat [2], Mahmoud Ahmed El Afif [3]

[1](Assistant lecturer of Pediatric Nursing, Faculty of Nursing / tanta university, Egypt).
[2](Professor of Pediatric Nursing, Faculty of Nursing, Tanta University, Egypt)
[3](Professor of Pediatrics and Neonates, Faculty of Medicine, Tanta University, Egypt)
Corresponding Author: Zeinab Elsayed Hafez Elsayed

Abstract :
Background: *Distraction technique aims at shifting a child's focus from pain to another activity or interest.* ***The aim*** *of study was to determine the effect of active versus passive distraction technique on controlling pain associated with invasive nursing procedures among school aged children.*
Subjects and method: *A convenience sampling of hospitalized school aged children (75) assigned to invasive nursing procedures were participated in the study. The study was conducted at Pediatric Medical department of Tanta Main University Hospital.*
Three Tools were *used to collect data: Structured Interview Schedule, Numeric Pain Rating Scale, and Children Behavioral Distress Observational Check List.*
The results: *There was statistically significant difference between pain intensity in active and passive distraction groups and between control groups. In relation to, the mean total behavioral distress among children was lower in active, passive distraction groups than no distraction group with a statistically significant difference between them.* ***Conclusion:*** *Active distraction technique was more effective than passive or no distraction technique in decreasing intensity of pain of school aged children during invasive nursing procedures. Both active and passive distraction techniques had a positive effect in decreasing physiological signs and behavioral distress that occurred during invasive nursing procedures.*
Recommendation*: Active distraction technique should be applied for children during invasive nursing procedures, integrated into the routine daily nursing care as an application of non-pharmacological pain management in hospitals.*

Keywords: *Active Distraction, Invasive Nursing Procedures, Pain, Passive Distraction, and School Aged Children.*

Date of Submission: 13-11-2018 Date of acceptance: 28-11-2018

I. Introduction

Hospitalization is considered as a stressful event for children; the environment which surrounds the children in a hospital, physical conditions such as pain and underlying disease, hospital procedures such as blood tests or even medical examinations in the hospital could be source of stress for children. The stress in children can lead to sleep or appetite disorders, developmental disorders and it can delay the disease recovery process [(1)].

Children often experience unpredictable and severe procedure-related pain in hospitals that can be associated with negative emotional and psychological implications. These medical procedures also induce anxiety, fear, and behavioral distress in children and their families, further intensifying their pain and interfering with the procedure. It is well - documented in the pediatric literature that intrusive health care experiences can have a profound impact on a child's psychological sense of well-being and ability to cope with current and future healthcare experiences[(2)].

Invasive procedures, particularly needle insertions, are among the most common experienced procedures, it's reported by children as being the most feared aspect of attending hospital. Invasive procedures are horrifying for many hospitalized children and they are worse than the disease itself. The seemingly endless barrage of needle sticks terrifies children and tears at the heart of parents, who are unable to protect their children [(3)].

Pain and distress can be managed by using both pharmacological and non-pharmacological method. Non pharmacologic techniques assist children in coping with pain and give them an opportunity to feel a sense of mastery or control over the situation. Distraction out is the most commonly used non pharmacoclogical intervention for procedural pain and distress [(4)].

Distraction is a non-pharmacological intervention that involves engaging a child in a wide variety of activities to help him or her focus attention on something other than pain and the anxiety associated with the procedure. Distraction activities include visual distraction (counting objects, watching TV), vocal distraction (listening to music), touch-motion distraction (slow regular breathing), and purposive distraction such as using toys [(5)].

Non pharmacological techniques such as distraction, relaxation, guided imagery and cutenouse stimulation, provide coping strategies that may help reduce pain perception, make pain more tolerable, decrease anxiety and enhance the effectiveness of analgesics or reduce the dose required. In addition, these techniques decrease the perceived threat of pain, provide a sense of control, enhance comfort and promote rest and sleep. These strategies are safe, noninvasive and inexpensive and most are independent nursing functions [(6)].

Distraction has two forms: active and passive. Active distraction requires the child's attention and engagement in an action during the medical procedure (for example, playing with an interactive toy, or a video game). In contrast, passive forms of distraction require the child to observe stimuli (for example, by watching television, or listening to music). Distraction is a simple technique which does not require any specific training and can be implemented by nurses, parents or other health care personal besides, it has a minimal cost and implies no risks for the child [(7)].

Utilizing cost-effective intervention strategies is increasingly imperative with the ever-increasing demands on the health care system. Effective pain management strategies are multidisciplinary, proactive, anticipatory, and formed to meet the assessed needs of each pediatric patient. The potential ramifications of poorly managed procedural pain are staggering and the obligation to improve practice is evident. The effective management of pain is, after all, a fundamental human right [(8)].

II. Aim of the study

Determine the effect of active versus passive distraction technique on controlling pain associated with invasive nursing procedures among school aged children.

III. Subjects and Method

3.1 Study design: A quasi-experimental research design was used in the present study.

3.2 Study hypotheses: School aged children who were exposed to active distraction technique expected to have more control of pain than those who were exposed to passive distraction technique.

3.3 Study setting:

The study was conducted at Pediatric Medical department of Tanta Main University Hospital it consists of two floors; The first one contains eight unites namely; Chest ward, Cardiology ward and Neurology ward while the second one contains Pediatric Endocrine unit, Pediatric Renal ward, Pediatric Hereditary ward and finally Pediatric Liver ward which are the main pediatric wards in the Pediatric Medical Department in Tanta University Hospital

3.4 Subjects: A convenient sample of all hospitalized school aged children assigned with invasive nursing procedures were collected from the above previously mentioned unit they accounted 75 children. The sample size was based on the following parameters coefficient level 90% and error level 5%. They were divided randomly into three equal groups namely:

1-Study group (I): Twenty five school age children who received active distraction technique.
2-Study group (II): Twenty five school age children who received passive distraction technique.

3-Control group (III): Twenty five school age children who received routine hospital care

3.5 Tools of the study:

Three tools were used in the current study as follows:

Tool I: Structured Interview Schedule: It was developed by the researchers after extensive reviewing of recent literature to collect data about school age children. It contained characteristics of school aged children such as age, sex, level of education, residence, diagnosis and duration of disease.

Tool II: Numeric Pain Rating Scale (NPRS): was used to measure the subjective pain intensity of the children. The NPRS is an 11 point scale ranged from 0-10. A written form is frequently used with the numeric value of (0-10) written out (0) no pain, (10) sever possible pain. And scoring system of numeric pain rating scale (NPRS): No pain (0), Mild pain: (1-3), Moderate pain: (4-6), and Sever pain :(7-10).

Tool III: It consisted of two parts:

Part I: Children Behavioral Distress Observational Check List: It was developed by **Elliot (1987)** and used to observe children's behavioral reactions during procedures which indicate discomfort (cry, scream, physical restraint, verbal resistance, emotional support, information seeking, verbal pain and flail) at 15 second intervals throughout the procedure, giving them score according to the severity of distress shown by the child. The scores were summed for each 15 second interval within phases of the procedure and then were divided by the number of intervals to obtain a mean score. Each item was classified into (4) points according to the severity of distress where as: Sever distress (4), Moderate stress (3), Mild stress (2), and No distress (1). The total score of children behavioral distress was categorized as the follows: 70 and more was considered sever distress, 70 > -60 was considered moderate distress, 60 >-50 was considered mild distress, Less than 50% was considered no distress.

Part II: Physiological measurement of school aged children: It included measuring vital signs for three time before, during and after invasive nursing procedure.

Method

1- An official Permission to conduct the study was obtained from the responsible authorities of the Neonatal Intensive Care Unit after explanation of the aim of the study.

2- **Ethical consideration:** Nature of the study didn't cause any harm or pain to the entire sample. Oral consents were obtained from mothers of the selected age children school aged children after explaining the aim of the study, and its benefits by the researcher. Pediatric nurses who were working in pediatric medical wards were also informed about the aim of the study. The school aged children and their mothers had the right to withdraw from the study at any time without any potential. Privacy and confidentiality of information and the result was maintained

3- **Developing of the study tools:** Three tools were used for data collection:

- Tool I: Structured Interview Schedule: It were developed by the researcher after extensive reviewing of recent literature data such as age, sex, level of education, residence, diagnosis and duration of disease. And Tool II: Numeric Pain Rating Scale (NPRS): was adapted to measure the subjective pain intensity of school aged children and **Tool III**: it consisted of two parts: **Part I**: Children behavioral distress observational check list: was used to observe children's behavioral reactions during procedures. **Part II:** Physiological measurement of school aged children: it included measuring vital signs which were measured before, during and after invasive nursing procedure.
- Then the study tools were tested for its content and face validity by jury test of three experts in the field of pediatric nursing to evaluate the individual items as well as the entire tool as being relevant and appropriate to test what they wanted to measure.
- The face validity of the tool was calculated based on content validity index (%) of its items and it was 94.8%.
- To assess reliability, the study tools were tested by the pilot subjects at first session and the calculated Cronbach's Alpha was 0.894 and the pilot sample was included in the study sample as well as the reliability of the study tool (too II, and tool III part 1)
- **Pilot study:** A pilot study was carried out before starting the data collection. It was done on a sample of 10 school aged children to test clarity, visibility and applicability of the study tools.

4- **Implementation of the study:** the study was conducted through three phases:

- **Assessment phase:** It was carried out by the researcher for all school age children admitted to pediatric department to collect baseline data, to assess the child who meets the inclusion criteria and exclusive criteria of this study. Additionally the researcher explained the general objectives of the study.
- **Implementation phase:** the selected children and their mother were interviewed individually.
  - The researcher began collecting socio demographic data of school aged children in active distraction group by using **(Tool I**).This step took about 10 minutes. Every child was asked to interact with an active game (subway) on the mobile phone before time of the procedure about 5-10 minutes and during procedure the researcher measured intensity of pain by using NPRS as every child was asked to rate intensity of pain by himself using **(Tool II**). This step took about 2 minutes.
  - The same steps were carried out the selected children in the passive distraction group except they were exposed to passive distraction technique which likes a mobile phone. Moreover, school age children

enrolled in non distraction group were passed to the same steps, but they were received routine hospital care no receive active and passive game.

- The distraction tool used in the study for both active and passive group was the mobile phone. Before time of the procedure about 5-10 minutes, every child was setting on his /her bed and the mobile phone was used as an active and passive instrument. As active one, the school aged children in active group were asked to interact with preferred game onto it, at the same time, it can be used as passive instrument where those in passive group were asked to watch a cartoon film onto it.
- Time of engaged activity was predetermined and was equal for all school aged children in both active and passive distraction groups. The researcher observed the school aged children in the three groups for their behavioral reactions that occurred before, during and after invasive nursing procedures (as mentioned before) at 15 second intervals throughout the procedure, and recorded by the researcher using **(Tool III Part I)**.
- Vital signs were measured by the researcher before, during, and after procedure. The pulse rate, and O2 saturation of the children in active, passive and no distraction group were measured by using pulse oximeter moreover; children's body temperature and respiration were measured by the researcher and recorded **(Tool III Part II)**.

- **Evaluation phase:** The evaluation was done to the school age children in both active and passive distraction groups regarding level of pain and level of behavioral distress accompanied invasive nursing procedures and compared to control group. The data was collected over a period of six months from the beginning of October to the end of March 201**7**.

5- Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 19. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category. Comparison between the study was done using Chi-square test, ANOVA test, and Friedman test. Correlation between variables was evaluated using Pearson's correlation coefficient (r). Significance was adopted at $p<0.05$.

IV. Results

Table (I) showed the biosocial characteristics of the school age children .As regards the age of the school aged children, it was clear that more than two thirds of children (64% and 68%) of them respectively in both active distraction and no distraction group aged 10-12 years old with the mean age (10.12±1.48and 10.24±1.64) respectively in active distraction group, compared to(88%) of passive distraction group a mean age of 11.12±1.13years .A statistically significant difference regarding the age between three groups was found where p= 0.031, F=3.630

In relation to the sex of the school aged children, it was evident that nearly three quarters (72%) of the active distraction group were males, while 68% and 76%of them were females in passive distraction in control group respectively. Regarding their residence, the majority (96%) of them were living in rural areas in both active and passive distraction group compared to 92% in control group with a statistically significant difference regarding sex between the three groups where p=0.001*

Regarding their education level, it was found that 40% of the active distraction group and control group were in the 4th and 5th level while 56% of the passive distraction group of were at 6th level of education.

Figure (I) presents pain intensity measures during invasive procedures. It is obvious that 16% of children in active group and 12% in passive distraction group didn't have pain compared to only 4% of control group. At the same time, there was 84% of children in active group had mild pain, compared to 60%and 36% of those children in passive distraction group and control group ,respectively.

The same figure reveals that 28% of children in passive distraction group had moderate pain compared to 44% of control group. Additionally, 16% of school aged children in control group had severe pain compared to none of those children in both active and passive distraction group.

Figure (II) explained the pain intensity scores, it was found that mean score of pain was (1.32±0.85, 2.68±1.82, and 4.40±2.38) in active, passive distraction and control group respectively. A was statistically significant difference was found between pain intensity in active and passive distraction group where P=0.033 and between active distraction and control group where P=0.0001. On the other hand significant difference was noticed between passive distraction and control group in the study where p=0.005.

Figure (III) illustrated total behavioral distress scores among the school children before, during and after invasive nursing procedures. It was noticed that the total mean behavioral distress scores among the school aged children in active distraction group was the same before, during and after invasive nursing procedure, (8.00±0.00) and there was no significant difference between it before, during and after procedure. In contrast to

passive distraction group, it was 8.56±1.47 before procedure then elevated to 8.80±1.63 during procedure and then decreased to 8.12±0.33 after procedure and there was statistically significant difference between before, during and after procedure within the same group where p=0.013. In relation to the control group, total mean behavioral distress scores among those children was14.36±3.00 before procedure then raised greatly to 17.76±4.32during procedures and decreased sharply to 9.84±1.65 after procedure. A statistically significant difference was found between before, during and after procedure within this group where p= 0.0001.

According to comparison of the total behavioral distress mean scores among the children in the three groups before, during and after procedure, it was found that the total behavioral distress scores among the school aged children before procedure in active distraction group was 8.00±0.00 compared to 8.56±1.47 in passive distraction group and 14.36±3.00in control group . while during invasive nursing procedure, the behavioral distress mean score were (8.00±0.00, 8.80±1.63, and 17.76±4.32) in active, passive distraction group and control group respectively with a statistically significant difference between them where p= 0.0001. In addition, the behavioral distress mean scores among children was(8.00±0.00, 8.12±0.33, and 9.84±1.65) among active distraction, passive distraction and control group respectively after procedure .with a statistically significant difference between them where as p=0.0001.

Table (II) described the correlation between pain intensity scores and age of children, duration of disease, behavioral distress severity, vital signs and O2 saturation among the school age children with invasive nursing procedures during procedures. According to age of children, there was negative non significant correlation between age and pain intensity score in the three groups. In contrary to duration of disease where a positive non significant correlation between it and pain intensity score in the three groups was found . At the same time there was positive non significant correlation between severity of behavioral distress and pain intensity score in passive distraction group , while it was positive and significant in control group where p= 0.003.

In addition, there was positive not significant correlation between children's body temperature, pulse rate and respiration and pain intensity score in both active and passive distraction groups compared to control group where there was positive and significant correlation between these previously mentioned vital signs and pain intensity score where p= 0.0001.Otherwise, oxygen saturation where there was negative non significant correlation between it and pain intensity score in both active and passive distraction groups except control group as it was negative but significant and p=0.0001.

Table (III) explained correlation between behavioral distress scores (severity) and age of children, duration of disease, vital signs and O2 saturation among the school age children received passive distraction technique with invasive nursing procedures before, during and after procedure. Regarding the age, there was negative non significant correlation between it and behavioral distress severity before, during or after procedure but there was positive non significant correlation among duration of disease in days, body temperature, pulse rate and respiratory rate before, during or after procedure was found compared to oxygen saturation where a negative non significant correlation was found between it and behavioral distress either before, during or after procedure.

Table (IV) illustrated the correlation between behavioral distress scores (severity) and age of children, duration of disease, vital signs and O2 saturation among the school age children (received routine hospital care) with invasive nursing procedures before, during and after procedure. It was clear that there was negative non significant correlation was found between the age of the school age children, and severity of behavioral distress before, during and after procedure while there was positive non significant correlation between duration of disease and severity of behavioral distress. In addition, it was positive non significant among body temperature, pulse rate, respiratory rate and behavioral distress before and after procedure but this correlation became significantly positive during procedure where as p=0.0001.

In contrast to oxygen saturation, there was negative non significant correlation between it and severity of behavioral distress before and after procedure while it was significantly negative during procedure where as p=0.001.

Table (I): Percentage distribution of the school aged children with invasive nursing procedures related to their characteristics.

Characteristics of the school aged children.	The studied hospitalized school aged children (n=75)						χ^2 P
	Study group of active distraction (n=25)		Study group of passive distraction (n=25)		Control group of routine hospital care (n=25)		
	N	%	N	%	N	%	
Age years:							
8-<10	9	36.0	3	12.0	8	32.0	4.227
10-12	16	64.0	22	88.0	17	68.0	0.121
Range	8-12		9-12		8-12		
Mean±SD	10.12±1.48		11.12±1.13		10.24±1.64		
F-value	3.630						
P	0.031*						
Sex:							
Female	7	28.0	17	68.0	19	76.0	13.517
Male	18	72.0	8	32.0	6	24.0	0.001*
Residence:							
Urban	1	4.0	1	4.0	2	8.0	0.528
Rural	24	96.0	24	96.0	23	92.0	0.768
Education level:							
2nd and 3rd level	8	32.0	3	12.0	7	28.0	5.585
4th and 5th level	10	40.0	8	32.0	10	40.0	0.232
6th level	7	28.0	14	56.0	8	32.0	

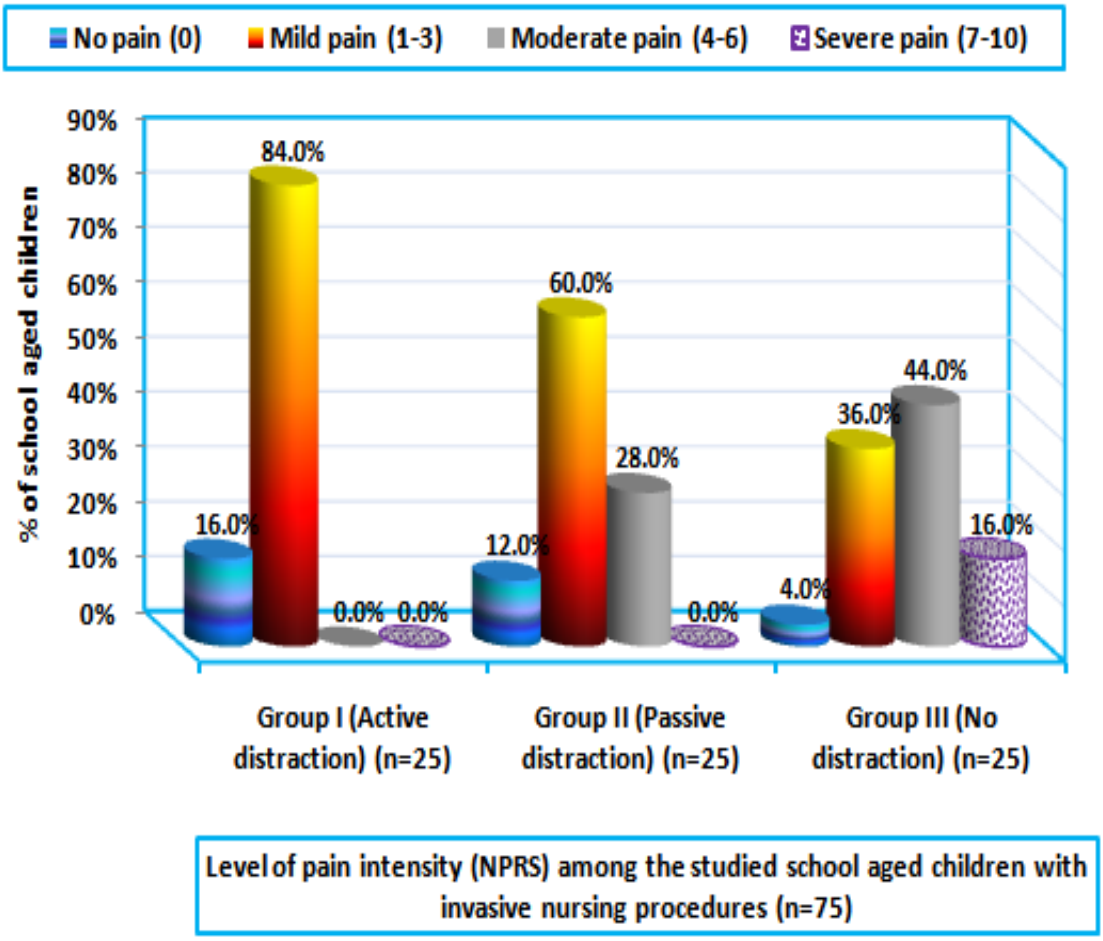

Figure (I): Level of pain intensity measures by Numeric Pain Rating Scale among the hospitalized school aged children with invasive nursing procedures during procedures.

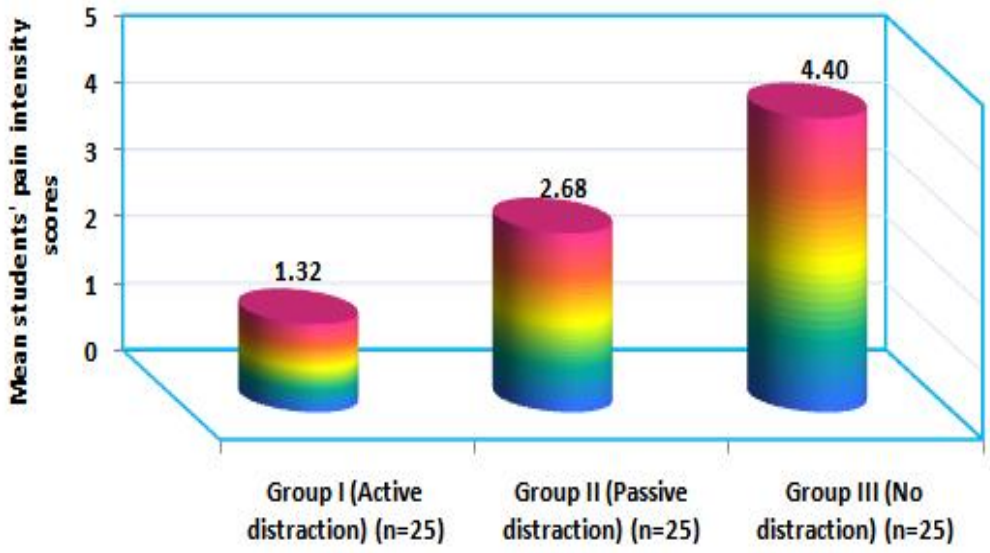

Figure (II): Mean scores of pain intensity measured by Numeric Pain Rating Scale among the hospitalized school aged children with invasive nursing procedures during procedures.

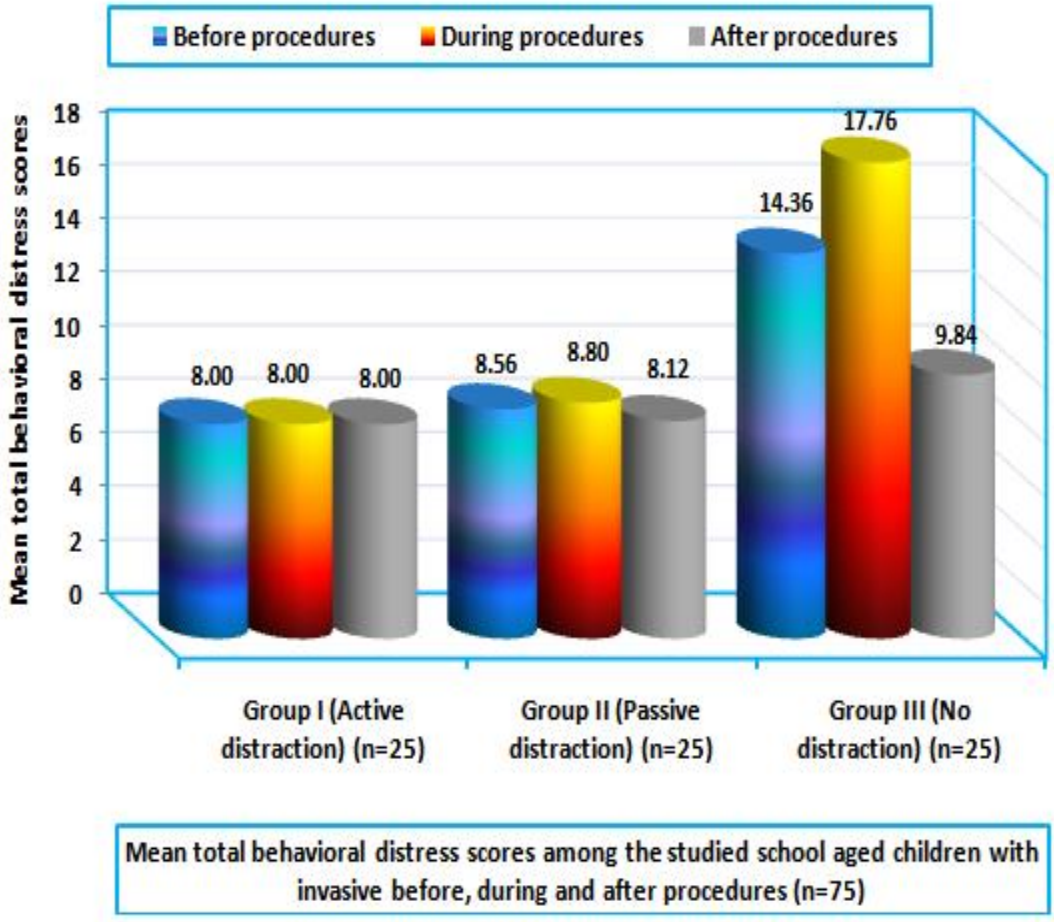

Figure (III): Total behavioral distress scores among the hospitalized school aged children with invasive nursing procedures before, during and after procedures

Table (II): Correlation between pain intensity scores and age of children, duration of disease, behavioral distress severity, vital signs and o2 saturation among the school aged children with invasive nursing procedures during procedures.

Variables	Pain intensity scores among the hospitalized school aged children during procedures (n=75)					
	Study group of active distraction (GI) (n=25)		Study group of passive distraction (GII) (n=25)		Control group of routine hospital care (GIII) (n=25)	
	r	P	r	P	r	P
Age in years	-0.036	0.864	-0.054	0.801	-0.267	0.197
Duration of diseases in days	0.022	0.915	0.486	0.014	0.139	0.508
Behavioral distress scores (severity)	-	-	0.331	0.082	0.311	0.003*
Body temperature	0.363	0.075	0.026	0.904	0.848	0.0001*
Pulse rate (B/m)	0.251	0.0.362	0.215	0.302	0.830	0.0001*
Respiratory rate	0.394	0.051	0.103	0.624	0.807	0.0001*
Oxygen saturation (O^2)	-0.347	0.089	-0.183	0.381	-0.799	0.0001*

Table (III): Correlation between behavioral distresses scores (severity) and age of children, duration of disease, vital signs and o2 saturation among the school aged children (received passive distraction procedure) with invasive nursing procedures before, during and after procedures.

Variables	Behavioral distress scores (severity) among the school aged children who received passive distraction procedure (n=25)					
	Before procedure		During procedure		After procedure	
	r	P	r	P	r	P
Age in years	-0.317	0.122	-0.190	0.364	-0.151	0.471
Duration of diseases in days	0.074	0.724	0.109	0.605	0.127	0.547
Body temperature	0.022	0.918	0.007	0.974	-0.091	0.664
Pulse rate (B/m)	0.117	0.578	0.158	0.452	0.143	0.497
Respiratory rate	0.106	0.613	0.177	0.397	0.029	0.890
Oxygen saturation (O^2)	-0.203	0.329	-0.228	0.273	-0.109	0.604

Table (IV): Correlation between behavioral distresses scores (severity) and age of children, duration of disease, vital signs and o2 saturation among the school aged children (received routine hospital care) with invasive nursing procedures before, during and after procedure

Variables	Behavioral distress scores (severity) among the studied school aged children who received routine hospital care (n=25)					
	Before procedure		During procedure		After procedure	
	r	**P**	**r**	**P**	**r**	**P**
Age in years	-0.230	0.268	-0.279	0.176	-0.139	0.507
Duration of diseases in days	0.179	0.393	0.044	0.834	0.064	0.760
Body temperature	0.060	0.776	0.730	0.0001*	0.191	0.360
Pulse rate (B/m)	0.134	0.523	0.651	0.0001*	0.287	0.165
Respiratory rate	0.179	0.393	0.688	0.0001*	-0.037	0.860
Oxygen saturation (O^2)	-0.196	0.348	-0.643	0.001*	-0.169	0.420

V. Discussion

In a pediatric department many children undergo painful procedures such as veinpuncture during treatment. Research suggests that prompt and accurate recognition and treatment of pain in children is important for their immediate comfort and lifelong development .Despite the recent interest in pediatric pain assessment, prevention and treatment many children are still not adequately treated to alleviate pain . In addition the use of premedication analgesics and sedatives is unsuitable for minimally invasive procedures such as vein puncture, whereas it is obviously effective in improving pain control during invasive procedures (9).

Non-pharmacologic interventions considered a useful approach to improve infant and child experience of painful procedures. It seems a safe, inexpensive and effective analgesia for short painful procedures .In the literature, the role of several methods, such as hypnosis, distraction and guided imagery in alleviating pain has been well documented in pediatric patients undergoing frequent invasive medical procedures .Of these, distraction is the most commonly used method for procedural pain of short duration (9).

Concerning characteristics of the school aged children, it was evident from the present study that the mean age of the school aged children was higher in active distraction group than both passive distraction group and no distraction group and three quarters of those children were females in both passive distraction and control group while the highest percentage of them in active distraction group were males and there was statistically significant differences between active, passive and no distraction groups regarding mean of age and sex. From the researcher point of view, the majority of the study samples were females which reflected the improvement and increased awareness of families in seeking medical advice for their females in rural areas where the highest percentage of the study sample were living in rural areas.

This result was in an agreement with Bagheriyan and Borhani (2013) who found in their study that the majority of subjects were females and minority were males with the mean age higher in active distraction group than no distraction group (10), and also with Ahmed (2015) who also found that the highest percentage of the study sample were females in control and distraction group (11). But this current result disagreed with Kaheni and Bagheri (2016) who mentioned that the majority of active distraction group were females while the majority in no distraction group were males and there was no statistical significant difference regarding age, gender and among children in both groups (12).

The present study also revealed that the highest percentage of the school aged children in active, passive and no distraction groups were living in rural areas. This may be due to Tanta Main University hospital provides different services to pediatric age group so people who are living in a lot of surrounding villages seek medical help for their children from it. In relation to education, the result of the present study indicated that two thirds of school aged children in both active and no distraction groups were between fourth and fifth primary education level while more than half of them in passive distraction group were at 6th primary education level.

The present study clarified that during vein puncture the majority of school aged children in active group and nearly two thirds in passive distraction groups experienced mild pain while in no distraction group more than one third experienced moderate pain and the mean score of pain in active group was less than mean score in both passive and no distraction group with a statistically significant differences between the mean score of pain intensity between active , passive distraction group and no distraction group .This means that active distraction technique was effective than passive technique or no distraction technique in decreasing intensity of pain.

The researcher illustrates this result as school aged children in active group were completely involved and occupied by the game so they focused their attention into it and as a result they paid less attention to invasive procedure, on the opposite sides, children in passive distraction group were only just viewer and in no distraction group nothing had been done so they focused on painful invasive procedure. This opinion is supported by gate control theory where the ideal distracter would require an optimal amount of attention involving multiple sensory modalities (visual, auditory and kinesthetic), active emotional involvement and participation of the patient to compete with the signals from the noxious stimulus (13).

This result was supported by Bagnasco and Pezzi (2012) who reported in their study that the majority of children in distraction group had either mild pain or no pain at all and there was a statistically significant differences between the mean score of pain in children with audiovisual distracting technique and the mean score obtained in those undergoing vein puncture without this technique (14). This result was also consistent with Ahmed (2015) who reached to the same result where active distraction technique was more effective than passive distraction technique in reducing children's pain during vein puncture (11), Also Hossein and Jafari (2017) agreed that distraction techniques can reduce the pain of veinpuncture in children (15). In addition, Maghsoudi and Zahra (2016) had reached to the same result as they found that active distraction technique was more effective in reducing pain intensity in children compared to using passive one and no distraction technique during vein puncture (16).

This result was incompatible with Bellieni and Cordelli (2006) who stated that a passive strategy such as watching TV might be more effective than an active one such as interactive toy for decreasing the pain

of vein puncture because the child distress interfered with their ability to interact with the distractor (17). Beside this, Vetri (2015), Abdelmoniem and Mahmoud (2015) clarified that both active and passive distraction techniques seemed extremely effective to reduce pain in children undergoing vein puncture without significant difference between them (18, 19) .

Vein puncture is commonly seen as one of the most painful and most frequently performed invasive procedures in hospital. In the pediatric population, it can be one of the most distressing events associated with medical encounters because of a natural fear of needles; almost all children have fear, pain, and distress before and during the procedure. They cry, are frightened and often refuse to cooperate. Negative response and psychological suffering may lead to more difficulty and lower success rates in vein puncture. It is, therefore, necessary to develop a safe, effective and easy to administer approach to minimize suffering while facilitating the success of medical interventions (88).

The current study also cleared that the total behavioral distress scores among the school aged children was different within the same group and also between both distraction groups and no distraction group where as the Mean ±SD of behavioral distress in active distraction group before procedure was lower than it in both passive distraction and no distraction group and there was a significant difference among the three groups and between both distraction groups and no distraction one. But there was no significant difference was found between active and passive distraction groups which mean that both were effective in reducing behavioral distress during invasive nursing procedures.

From the researcher point of view, the children in both distraction groups were occupied by playing the game in active group and watching carton game in the passive group so both pay less attention to painful procedure and as a result there was a reduction in behavioral reactions which are expected to be found before procedure. This result matched with Kaur and Sarin (2014) who declared that the mean distress score of children without distraction was higher than the mean distress score of children with cartoon distraction and there was statistically significant difference between passive group and no distraction group (21).

This result was in the same direction with Abd Allah and Mohamed (2018) who mentioned that the mean children's behavioral pain scoring in active distraction group before and after applying distraction technique was lower than it in passive distraction and in no distraction group and there was statistically significant difference between before and after applying distraction technique in both distraction groups .While the mean children's behavioral pain scoring in no distraction group was higher than both active and passive distraction groups and there was a statistically significant difference between mean of children's behavioral pain scoring in the three groups(22).

Beside, Kaheni and Rezai (2016) reached to the same result who illustrated that mean children's behavioral pain response scoring was higher in no distraction group than active distraction group there was a significant difference in the score of behavioral responses to pain between the two groups(23).This result was contracted with Mokbel (2011) who found in a study about the effect of distraction on preschool children's postoperative pain that no statistical significant difference between children's behavioral pain scoring all over three days after the application of routine nursing care (24).

The present study indicated that there was negative non significant correlation between pain intensity and age of school aged children in both distraction and no distraction groups. This result was consistent with Tufekci and Kucukoglu (2017) who found that there was a moderate negative correlation between the age of school age children and pain severity in the distraction and no distraction groups (25). This finding was against Bagheriyan and Borhani (2013) who found that there was a significant difference between pain intensity and age of studied children (10).

Also, with Shivcharan and Deshpande (2016) who proved that none of the demographic variable was found to have significant association with the level of pain among children undergoing veinpuncture either in control or experimental group (26).In addition, there was positive non significant correlation between pain intensity and behavioral distress in passive distraction group but it was significant in no distraction group in the current study. This can be interpreted that the children in this group just received routine nursing care without any distraction technique so they felt more pain with high pain intensity score so they expressed more behavioral distress than other children in both distraction group.

This result was matched with Kaur and Sarin (2014) who confirmed that there was moderate positive correlation between pain perception and distress in children with carton distraction and there was high positive correlation between pain perception and distress in children without cartoon distraction (21). At the same time, Bagheriyand Borhani (2013) mentioned that there was a direct and significant correlation between the numerical pain scale and behavioral distress (10).

The current study also revealed that there was positive significant correlation between pain intensity and vital signs as body temperature, pulse rate and respiratory rate in no distraction group while it was non significant in both distraction groups but it was significantly negative in relation to O2 saturation in no distraction group. This outcome was in an agreement with El Sayed and Ahmed (2016) who found that that

there was no statistical significant correlation between heart rate and pain intensity in the study group (27). In addition, with Vosoghi and Chehrzad (2011) who found that there was statistical significant difference in the average heart rate and pain intensity between two groups (28). This result disagreed with Abd Allah (2018) who found that there was no statistical significant correlation between heart rate and pain intensity in the study group or control group (22).

The finding of the present study clarified that; there was negative non significant correlation between the age of school aged children in passive distraction group and behavioral distress in the different phases of the procedure (before, during and after). This result can be explained that there was significant difference related to age of children in passive distraction group with higher mean in this group as mentioned in the results before so due to increased age of those children, the perception of pain is decreased and as a result the behavioral distress was declined or decreased.

This finding was supported by Bagheriy and Borhani (2013) who reported that there was a reverse correlation between the increase of age and behavioral pain scale score (10). This result disagreed with Piskorz and Czub (2018) who reported that age did not correlate in a significant way with either the level of experienced pain or with distress (29).

Concerning the correlation between behavioral distress scores (severity) and the age of the school aged children in no distraction group who received routine hospital care with invasive nursing procedures before, during and after procedure. The present study mentioned that there was negative non significant correlation between children age and severity of behavioral distress before, during and after procedure. This result was matched with Kaur and Sarin (2014) who mentioned that there was inverse relationship between the behavior pain response and the age of the child (21).

Regarding vital signs, there was positive non significant correlation between body temperature, pulse rate, respiratory rate and behavioral distress before and after procedure but this correlation became significantly positive during procedure. This result may be interpreted that those children did not receive any distraction technique just received routine nursing care so they experienced more acute pain and there was a positive significant correlation between pain intensity and vital signs as body temperature, pulse rate and respiratory rate in no distraction group and also there was a positive significant correlation between pain and behavioral distress and as a result there will be positive correlation between behavioral distress and vital signs.

VI. Conclusion

Based on the findings of the present study, it can be concluded that active distraction technique was more effective than passive or no distraction technique in decreasing intensity of pain of school aged children during invasive nursing procedures. Both active and passive distraction techniques had a positive effect in decreasing physiological signs and behavioral distress that occurred during invasive nursing procedures.

Recommendations

Based on the findings of the present study, the following recommendations are suggested:

For children:

- Active distraction technique should be applied for children during painful invasive nursing or medical procedures.
- Pediatric hospitals should be supplied with interactive toys for free to be used during painful invasive procedures.
- Establishment of playing units with interacting toys and provision of employees who can use and demonstrate to children how to use interacting toys.

For pediatric nurses:

- Application of non-pharmacological pain management in hospitals as a routine and daily care.
- An educational training program should be conducted to pediatric nurse about various methods of distraction to control children's pain during invasive nursing procedures
- Application of non-pharmacological pain management in hospitals as a routine and daily care.
- An educational training program should be conducted to pediatric nurse about various methods of distraction to control children's pain during invasive nursing procedures.

References

[1]. Kazemi S, Koosha G, and Besharat S. Music and anxiety in hospitalized children. Journal of Clinical and Diagnostic Research 2012; 6(1): 94-6.

[2]. Michelle L, Czarnecki N, and Turner P. Procedural pain management: a position statement with clinical practice recommendations. Pain Management Nursing 2011; 12 (2): 95-111.

[3]. Basol R. Using research to determine support for a policy on family presence during resuscitation. Dimensions in Critical Care Nursing Journal 2009; 28(5): 237-47.

[4]. Hanrahan K, Marie A, and Kleiber C, Building a computer program to support children, parents, and distraction during healthcare procedures. Computers Informatics Nursing Journal. 2012; 30(10): 554–61

[5]. Birnie K, Noel M, Parker J, et al. Systematic review and meta-analysis of distraction and hypnosis for needle-related pain and distress in children and adolescents. Pediatric Psychol Journal. 2014; 39(8):783–808.

[6]. Thrane S, Wanless S, Cohen S, and Danford C. The Assessment and non-pharmacologic treatment of procedural pain from infancy to school age through a developmental lens: A synthesis of evidence with recommendations. Pediatric Nursing Journal 2016; 31(1): 23–32.

[7]. Moadad N , Kozman K , Shahine R , Ohanian S, Badr LK. Distraction using the buzzy for children during an IV insertion. Pediatric Nursing Journal. 2016; 31(1):64-72.

[8]. Petovello K. Pediatric procedural pain management: A review of the literature. International Journal of Child Youth and Family Studies 2012; 4(1): 569–89.

[9]. Wanga Z , Sun L , and Chena A .The efficacy of non-pharmacological methods of pain management in school age children receiving veinpuncture in a pediatric department: a randomized controlled trial of audiovisual distraction and routine psychological intervention. Swiss Medical Weekly Journal 2008; 138(40): 579 –84.

[10]. Bagheriyan S, Borhani F, and Abbaszadeh A. Analgesic effect of distraction during veinpuncture in children with thalassemia. Iranian Journal of blood and cancer 2013; 5(1): 9-14.

[11]. Ahmed H . Effect of active and passive distraction on decreasing pain associated with painful medical procedures among school aged children. World Journal of Nursing Sciences 2015; 2 (1): 13-23.

[12]. Kaheni S, Bagheri-Nesami M, Goudarzian A, and Rezai M. The effect of video game play technique on pain of veinpuncture in children. International Journal of Pediatric 2016; 5(4):1795–802.

[13]. Barbara L, and Nickil P. Pediatric Nursing Caring for Children and their Families. 3rd ed., USA: Mandleco Co., 2012; 522-35.

[14]. Bagnasco E , Pezzi F, Rosa L, and Fornoni L. Distraction techniques in children during vein puncture: an Italian experience. Journal of Preventive Medical Hygiene 2012; 53(1): 44-48.

[15]. Hossein A, Jafari A, and Bagheri-Nesami M. The effect of distraction techniques on the pain of veinpuncture in children: A Systematic Review. Journal of Pediatric Review 2016; 9(4):4-6.

[16]. Maghsoudi S, Zahra Z, and Behnam H. Comparison of the effects of play dough and bubble making distraction techniques on veinpuncture pain intensity in children. Evidence Based Care Journal 2016; 5 (4): 25-32.

[17]. Bellieni C, Cordelli D, Raffaelli M, Ricci B, Morgese G, and Buonocore G. Analgesic effect of watching TV during veinpuncture. Journal of Child Psychology 2006; 91(12):1015–7.

[18]. Vetri C , Angelino F , and Sansoni J . Distraction as a technique to control pain in pediatric patients during veinpuncture. A narrative review of literature. Pub med 68(1):52-62.

[19]. Abd Elmoniem S, Mahmoud S. Comparative evaluation of passive, active, and passive-active distraction techniques on pain perception during local anesthesia administration in children. Journal of Advanced Research 2015; 10(6):2-6.

[20]. Lindsay L, Meredith G, and Vandana L. Pediatric Evidence: The Practice-Changing Studies. 1st ed., China: Lippincott Williams & Wilkins Co., 2016; 22-4.

[21]. Kaur B, Sarin Y, and Kumar Y. Effectiveness of cartoon distraction on pain perception and distress in children during intravenous injection. Journal of Nursing and Health Science 2014; 3(3): 8-12.

[22]. Abd Allah H, Mohamed A, and Fikry A. Effect of distraction techniques on minimizing pain associated with burn dressing changes among preschool children. Journal of Nursing and Health Science 2018; 7(2): 64-78.

[23]. Kaheni S, Rezai MS, Nesami MB and Goudarzian AH. The effect of distraction technique on the pain of dressing change among 3-6 year-old children. International Journal of Pediatric 2016; 4(28): 1603-10.

[24]. Mokbel R. Effect of distraction on preschool children's postoperative pain, Unpublished Master Thesis. Faculty of Nursing, Banha University.2011.

[25]. Tufekci F, Kucukoglu S, and Aytekin A. A new distraction intervention to reduce veinpuncture pain in school-age children: different colored flashlights; an experimental study with control group. Ata International Journal of Caring Sciences 2017; 10(1): 354.

[26]. Shivcharan S , Deshpande J, Borude S . Effectiveness of cartoon movies as distracter on pain among children undergoing veinpuncture. International Journal of Science and Research 2016; 5(6): 2241-42.

[27]. El Sayed H, Ahmed A, and Alalo F. Intensity after an ice pack application prior to veinpuncture among school-age children: An Experimental Study. Journal of Education and Practice 2016; 36(7): 16-25.

[28]. Vosoghi N, Chehrzad M, Abotalebi G and Atrkar R. Effects of distraction on physiologic indices and pain intensity in children aged 3-6 undergoing IV injection. Journal of Faculty of Nursing & Midwifery, Tehran University of Medical Science 2011; 16 (3):105-12

[29]. Piskorz J, and Czub M. Effectiveness of a virtual reality intervention to minimize pediatric stress and pain intensity during veinpuncture. Journal of Special Pediatric Nursing 2018; 23 (1): 2201.

Zeinab Elsayed Hafez Elsayed. "Effect of Active versus Passive Distraction Technique on Controlling Pain Associated with Invasive Nursing Procedures among School Aged Children. " IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 7, no.6 , 2018, pp. 70-81.