

Effect of Active and Passive Distraction on Decreasing Pain Associated with Painful Medical Procedures among School Aged Children

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Abstract: Paediatric patients are often subjected to unexpected medical procedures that cause pain such as intravenous (IV) insertions, intramuscular injections and central venous port access. Distraction is a commonly used non-pharmacologic pain management technique. Distraction is a technique that has been used in hospitals to help children to tolerate painful medical procedures. The current study aimed to assess effect of active and passive distraction on decreasing pain associated with painful medical procedures among school aged children. Subjects and methods: A quasi-experimental research design was utilized to achieve aim of the current study. Research hypotheses: There were 3 research hypotheses which were school aged children who will be exposed to active distraction will experience mean scores of pain less than those will be exposed to passive and no distractions, school aged children who will be exposed to active distraction will be experience intensity of pain less than those will be exposed to passive and no distractions and there will be association between mean scores of pain and selected demographic variables during painful medical procedures among school aged children. Setting: the current study was conducted in medicine wards in 2 of educational pediatric hospitals, Cairo University. Subjects: A convenient sample consists of 75 hospitalized school age children undergoing painful procedure (IV medication) was divided into 3 equal groups, (25 children in active distraction group, 25 children in passive distraction group and 25 children in control group). Tools for Data Collection: There were four tools used in the current study as the following: A structured socio-demographic questionnaire, Numeric Rating Scale (NRS), Wong-Baker FACES Pain Rating Scale and child's pain record. Results: The results of current study revealed that the majority of school age children in both active and no distraction groups were females, while majority of them in passive distraction group was males and the mean age of those school age children in active group was $8.344 \pm .96526$ years whereas in passive group was 8.784 ± 1.1671 years while in no distraction group was 8.308 ± 1.133 years. The results of current study explained that mean scores of pain based on the NRS in active group was 2.98 ± 1.041 and in passive group was 4.44 ± 1.044 whereas in no distraction group was $5.20 \pm .81$. Conclusion: The current study concluded that active distraction is effective in decreasing intensity of pain of school age children greater than in passive or no distraction techniques. And there were statistically significant differences between mean scores of pain, intensity of pain in active, passive and no distraction groups, this proved the hypotheses of the current study. Recommendations: the current study recommended that active distraction should be applied for children with during painful medical procedures, provision of training program for nurses about effectiveness of active distraction in care of children with during painful medical procedures

Key words: Active Distraction • Passive Distraction • School Age Children • Pain

INTRODUCTION

Pain is a complex, multidimensional and subjective experience that consists of physiological, sensory, emotional, cognitive and behavioral components. Pain is an important clinical problem that, if persists, can slow down the healing process.

Pain is described as the fifth vital sign and inadequate pain management is linked to numerous immediate and long-term negative outcomes. Although the experience of pain is unpleasant, it has an adaptive function, its presence indicates that tissue damage is about to occur and it initiates a protective response [1].

Medical procedures are procedures carried out commonly in health care settings today as a means of providing diagnostic information, treatment, or palliation according to child's condition. But unfortunately, many of which produce pain. Any procedure causes actual or potential tissue damage has the potential to cause pain. Therefore, potentially painful procedures can range from simple procedures, such as venipunctures to more invasive procedures, such as lumbar punctures and can occur in a variety of settings in the hospital. Regardless of the procedure or setting, if pain is not anticipated and prevented or treated appropriately, patients may experience numerous harmful effects and pain levels may be higher with subsequent procedures [2].

In a study carried out in inpatient units at eight Canadian paediatrics hospital for children up to 18 years of age, it had been found that out of 3822 children included in the study, 2987 (78.2%) had undergone at least one painful procedure in the 24 hour period preceding data collection for a total of 18929 painful procedures, 78.1% of the children who had a painful procedure, a pain management intervention in the previous 24 hours was documented in the chart. For 84.8% had a pharmacological intervention, 26.1% had a physical intervention, 25% had a psychological intervention and 32.3% had a combination of interventions. Paediatric intensive care units reported the highest proportion of painful procedures and analgesics administered [3].

Paediatric patients are often subjected to unexpected medical procedures that cause pain such as intravenous insertions (IV), intramuscular or subcutaneous injections and central venous port access. The use of topical creams, such as lidocaine and prilocaine, to provide topical anaesthesia has been shown to reduce the pain associated with these procedures. But even when anaesthetics are administered, paediatric patients continue to report procedural related pain [4].

Regardless of the illness or reason for the medical procedures or intervention, it is widely recognized that even the most minor procedures can cause significant pain. Common procedures such as needle injections for drawing blood, intravenous cannulation, or intramuscular medications tend to be the most frequent, painful and dreaded procedures that children encounter [5]. Paediatric pain from painful medical procedures results in short term suffering, but there are recent data to indicate that there are also long term detrimental effects. Specifically, early

painful insults might have lasting negative effects on neuronal development, pain threshold and sensitivity, coping strategies, emotionality and pain perceptions [6].

Distraction in paediatrics is often defined as a strategy whether cognitive or behavioural that draws a child's attention away from noxious pain stimuli [1]. Distraction is a technique that has been used in hospitals to help children to tolerate painful medical procedures. Distraction is important because discomfort or pain from medical procedures can last anywhere from 5 to 45 minutes and sometimes longer [7]. Distraction is a commonly used non pharmacologic pain management technique used by both health care professionals and parents to attenuate procedural pain. Distraction operates on the assumption that by shifting a child's focuses to something engaging and attractive his or her capacity to attend to painful stimuli is hindered, thereby reducing pain [1].

Distraction techniques can be broadly classified into two types: active and passive. Active forms of distraction include interactive toys or electronic games, virtual reality, controlled breathing, guided imagery and relaxation. Active techniques distract the child by involving him or her in some activity during a procedure. Passive forms of distraction are used when the child needs to remain calm and quiet during a procedure. Listening to music and watching television are used as passive forms of distraction [2].

Although distraction is widely recognized as an effective acute pain management strategy for children, recent researches suggest that certain types of distraction tasks may be more effective than others. For example, some studies have demonstrated that interactive distraction, which requires the child to cognitively engage with the distracting stimulus, is more effective than passive distraction, which only requires the child visually or auditory observes the distracting stimulus [8].

Nurses have an ethical obligation to relieve a child's suffering not only because of the consequences of unrelieved pain but also because appropriate pain management may have benefits such as earlier mobilization, shortened hospital stays and reduced costs. To provide effective nursing management of children in pain, anticipate the presence of pain and recognize the child's right to pain control.

Nursing management involves the following actions to increase and maintain patient comfort: pharmacologic intervention; complementary therapy; monitoring,

evaluating and documenting the effectiveness of pain-control measures to provide optimal comfort; and patient education [9].

Significance of Study: Children being cared for in hospital undergo numerous painful medical procedures; recent research found that 78% of hospitalized children had at least one painful procedure in the last 24 hours. Healthy children also experience numerous painful procedures as part of routine medical care [3]. Nurses reported that pain signs in 50% of the inpatients hospitalized children which were detected during clinical procedures. Nurses reported that pain was managed in 78% inpatients by using pharmacological and non-pharmacological interventions. Researches findings provide evidence of the high prevalence of pain in pediatric inpatients and the under recognition of pain by health professionals [10]

Children often experience unpredictable and severe procedures related to 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 procedures. Medical procedures, particularly needle insertions, are among the most feared experiences reported by children [11].

Painful medical procedures can cause short-term and long term effects. These effects consist of a variety of physical, emotional, behavioural, cognitive and psychological manifestations, including fear, anxiety, anger, aggressive behaviour, inability to concentrate, embarrassment, refusal to consent to further procedures and distrust of the health care team and may affect overall economic, social and spiritual well-being [9].

Diversional therapy has been used successfully as an intervention to decrease children's pain during painful procedures, diversional therapy protocols differ in various ways, most notably in the attention required by the participant to engage in the distraction [6]. Many studies have proved effectiveness of active distraction than passive distraction in adult, based upon this the current study aimed to assess the effectiveness of active distraction, in comparison to a passive distraction to increase children's pain tolerance during painful medical procedures and achieve children comfort as much as possible.

Conceptual Definition: Painful medical procedure is any procedure that causes pain to hospitalized child and makes the child suffers physically.

Operational Definition: In the current study painful procedure which used was I.V. medication.

Passive Distraction: In the current study cartoon game in cell phone was used as a passive distraction.

Active Distraction: In the current study active game in cell phone which requires engaging or sharing from the child in the game was used as an active distraction.

Aim of the Study: The current study aims to assess effect of active and passive distraction on decreasing pain associated with painful medical procedures among school aged children.

MATERIALS AND METHODS

Research Design: A quasi-experimental research design was utilized to achieve aim of the current study.

Research Hypotheses:

- School aged children who will be exposed to active distraction will experience mean scores of pain less than those will be exposed to passive and no distractions.
- School aged children who will be exposed to active distraction will experience intensity of pain less than those will exposed to passive and no distractions.
- There will be association between mean scores of pain and selected demographic variables during painful medical procedures among school aged children.

Setting: The current study was conducted in all medicine wards in 2 of educational pediatric hospitals, Cairo University, these hospitals provide care for all children patients from all over Egypt and free.

Subjects: A convenient sample consisted of 75 of hospitalized school age children undergoing painful medical procedure which in the current study was IV medication divided into 3 equal groups, (25 children in active distraction group, 25 children in passive distraction group and 25 children in control group). Determination of sample size was calculated according to statistical

procedure known as power analysis of the sample. According to power analysis and admission rate of school age children in the 2 hospital which was about 300 school age child in 2013, the size of the sample which resulted was 75 of hospitalized school age children undergoing IV medication. School age children were included in the study after fulfilling the inclusion criteria which were:

- Children of both sexes
- Children age for 8-12 years.
- Children able to count numbers.
- Children submitted to the same IV medication (antibiotic)
- There is no cause of pain except painful medical procedure (IV medication).

Tools for Data Collection: There were four tools used in the current study as the following:

1. A structured socio-demographic questionnaire: this tool was developed by research investigator after reviewing the related recent literature and 5 experts in pediatrics nursing to collect socio-demographic data of hospitalized school age children, it included 6 questions, those questions were related to age, sex, level of education, residence and diagnosis and duration of disease.. Questions were in the form of closed ended questions.
2. Numeric Rating Scale (NRS): It was adopted from Wong and Hockenberry [12], it is used to assess intensity of pain numerically, in which the child is asked to rate pain on a scale of 11 points from 0 to 10. NRS is used to measure a child's pain intensity in school age children 8 years and older. Children verbally rate the intensity of pain on a scale from (0) no pain to (10) worst pain possible; most hurt possible.
3. Wong-Baker FACES Pain Rating Scale (WBFS): which adopted from Wong & Hockenberry [12], it used to determine intensity of pain, it included 5 faces, in which each face is for a child who feels happy because he has no pain (no hurt) or sad because he has some or a lot of pain. Face (0) is very happy because he does not hurt at all. Face (1) hurts just a little bit. Face (2) hurts a little more. Face 3 hurts even more. Face (4) hurts a whole lot. Face (5) hurts as much as child can imagine, although the child does not have to be crying to feel this bad. The

child is asked to choose the face that best describes how he is feeling. WBFS is recommended for children age 3 years and older.

- A structured child's pain record: It was developed by research investigator to record intensity of child's pain during painful medical procedure.

Procedure: An official permission was obtained from the directors of educational pediatric hospitals after an explanation of aim of the study. Oral and written consents were obtained from parents of school age children who were included in the study after an explanation of the aim, tools, benefits and the duration of the study. Research investigator for ethical considerations dealt with active distraction group first, then with passive distraction group and lastly with no distraction group. First the research investigator met each school age child in medicine ward after being admitted and being hospitalized and started to be submitted to IV medications, then research investigator started to collect socio-demographic data of school age children in active distraction group by using a structured socio-demographic questionnaire and this took about 10-15 minutes for each child.

Once finishing form collecting socio-demographic data research investigator started to collect data regarding to measuring pain intensity and the steps of procedure were explained to each child. Each child in active distraction group was asked to interact with an active game in cell phone before time of IV medication about 5-10 minutes and during giving IV medication research investigator measured intensity of pain by using NRS as each child was asked to rate intensity of his/her pain by him/her self during IV medication by using NRS, this step took about 2-3 minutes for each child. After that each child was asked to report intensity of pain by using WBFS this step took about 2-3 minutes for each child. Intensity of pain which was measured by NRS and by WBFS was recorded in the child's pain record.

The same steps carried out with each school age child in active distraction group had done with each school age child in passive distraction group except each school age child in passive distraction group was exposed during IV medication to passive game which was cartoon film in cell phone. The same steps carried out with each school age child in active distraction and passive distraction groups had done with each school age child in no distraction group except each school age child in no distraction group was not exposed during IV medication to any active or passive game in cell phone.

The distraction instrument which used in active and passive distraction groups was cell phone, which was used in two ways as an active and passive distraction. Cell phone was used as a passive distraction with passive distractive group by showing the child a cartoon game. Cell phone was used in the procedure as an active distraction with active distractive group by engaging the child in a game that was programmed on the cell phone. Whereas control group nothing used with them and left to hospital routine.

Before time of I.V. medication about 5-10 minutes each child was seated at his/her bed where the cell phone was setup for both active and passive distraction groups and each child asked to engaged in activity as in active group and watch cartoon film as in passive group and being asked to assess intensity of pain during time of I.V. medication. Time of engaged activity in the cell phone was predetermined and was equal in time for all children active distraction group. Time of cartoon game was determined before and was equal for children in passive distractive group. The study took about 4 months, as it started from June, 2014 to end of September, 2014.

Pilot Study: An initial pilot study was done on 10% hospitalized school age children to evaluate the content of tools, its objectivity and feasibility and to explain any discrepancies in the tools. The results of pilot study were included in the study.

Validity of Tools:

Construct Validity NRS:

Convergent Validity of NRS was $t = 3.41$, $P < .01$.

Reliability of NRS: The test-retest reliability analysis found an interclass correlation coefficient of 0.83 ($P < 0.001$).

Validity of WBFS: Concurrent validity of Wong-Baker FACES Pain Rating Scale proved was visual analog scale and it was excellent ($r = 0.90$).

Reliability of WBFS: Reliability has been proved by the use of "test and retest" ($r > 0.5$).

Ethical Considerations: Parents of hospitalized school age children were informed about the purpose, tools and duration of the study after explaining to them the benefits of the study. Oral and written consents of the hospitalized school age children and their parents were gained. The

research investigator assured parents of hospitalized school age children about confidentiality of the data which were gathered from them during the study. During the study the researcher investigator informed parents of hospitalized school age children about their right to withdraw from the study at any time without any effect on the care provided for them and hospitalized school age children were assured about nothing would done to them.

Statistical Analysis: Data was analyzed using SPSS statistical package version 20. Numerical data were expressed as Mean \pm standard deviation. Qualitative data were expressed as frequency percentage. Chi-square test was used to examine the relation between qualitative variables; ANOVA test was used for comparison between means of the 3 groups. Pearson (r) Correlation was used to test correlation between variables, P -value = 0.05 was considered significant.

RESULTS

Table 1 explains that the more than half of school age children in both active and no distraction groups (56% & 52% respectively), were females, while three thirds of school age children in passive distraction group (60%) was males school age children. The same table represents that the mean age of school age children in active group was 8.3440 ± 0.96526 years whereas in passive group was 8.7840 ± 1.1671 years and in no distraction group was 8.3080 ± 1.133 years. Regarding to residence table 1 indicates that the highest percentage of school age children in active, passive and no distraction groups (52% & 60% & 56% respectively), were from urban areas. In relation to level of education table 1 shows that 28% of school age children in active group was in the second level of primary education, while the highest percentage of school age children in both passive and no distraction groups (32% & 40% respectively) were in 3rd level of primary education.

Table 1 presents that the highest percentage (44%) of school age children was in active group diagnosed as have enlargement of spleen whereas the highest percentage of school age in both passive and no distraction groups (28% & 24% respectively), was diagnosed as have enlargement of liver. Table 1 refers that the mean duration of hospitalization of school age children in active group was 4.80 ± 1.871 days, in passive group was 3.84 ± 1.344 days whereas in no distraction group was 3.88 ± 1.563 days. It is clear that from table 1 that

there were no statistically significant differences between active, passive and no distraction groups regarding sex, age, residence, diagnosis and duration of hospitalization as $p > 0.05$, whereas there was a statistically significant difference between active, passive and no distraction groups regarding level of education ($\chi^2=28.495, p=.005$).

As regards to intensity of pain based NRS, table 2 indicates that mean scores of pain intensity in active group was 2.98 ± 1.041 , but in passive group was 4.44 ± 1.044 , whereas mean scores of pain in no distraction group was 5.20 ± 0.816 . It is obvious from table 2 that there was a statistically significant difference between active, passive and no distraction groups regarding main scores of pain intensity based on NRS (F. test=9.732, $p=.000$). It is clear that table 2 proved the first hypothesis of the study.

In relation to intensity of pain based on WBFS, table 3 represents that two thirds of (40%) school age children in active group reported that painful medical procedure hurts just a little bit, while the highest score of school age children in passive distraction group (32%) reported hurts a whole lot whereas 64% of school age children in no distraction group reported hurts as much as child can imagine. It is clear from table 3 that there was a statistically significant difference between active, passive and no distraction groups regarding to intensity of pain based on WBFS ($\chi^2=39.097, p=.000$). It is obvious that table 3 proved the second hypothesis of the study.

Regarding intensity of pain based on NRS table 4 shows that there was no statistically significant relation between child's age and mean score of pain based on NRS in active, passive and no distraction groups ($r=0.18, p=.875$) and also there was no a statistically significant relation between child's age and intensity of pain in active, passive, no distraction groups based on WBFS ($r=.042, p=.722$).

It is clear that the same table represents that there were statistically significant relation between child's sex, residence, level of education, diagnosis and mean scores of pain based on NRS in active, passive and no distraction groups ($r=4.346, r=52.980, r=60.331, r=59.352, p<.05$, respectively). There were statistically significant differences between child's sex, residence, level of education, diagnosis and intensity of pain based on WBFS in active, passive and no distraction groups ($r=23.566, r=11.694, r =60.932, r=51.702, p<.05$, respectively).

Table 4 proved the third hypothesis of the study.

DISCUSSION

Children who are hospitalized are often subject to multiple medical procedures that can be stressful and painful, all of which can have a negative effect upon hospitalized children including emotional trauma associated with medical interventions. Despite improvements in pain medication, effective pain control continues to be a challenge for many patients and health care professionals. Distraction has emerged as an effective non-pharmaceutical technique for pain control. Psychological approaches such as distraction may be particularly useful when patients find pharmaceutical treatments inadequate, when medication has negative side effects or as an adjunct therapy. Technological based distraction has been demonstrated to have a positive impact on children's pain tolerance during medical procedures [13].

The results of current study revealed that more than half of school age children in both active and no distraction groups were females, while three thirds of them in passive distraction group were males and the mean age of those school age children in active group was 8.344 ± 0.96526 years whereas in passive group was 8.784 ± 1.1671 years while in no distraction group was 8.308 ± 1.133 years. There were no statistically significant differences between active, passive and no distraction groups regarding sex and mean of age.

The results of current study is contradicted with the results of study done by Bagheriyan *et al.* [14] who found in their study that the majority of subjects was males children and minority was females, the mean age of study group was 10.25 ± 1.33 years and in the control group was 9.90 ± 2.38 years, there was no significant difference seen between these two groups regarding various variables such as gender and age.

From points' of view of research investigator the majority of school age children were females this reflects improvement and raising awareness of many people in caring of their females children and seeking appropriate care for them rather than seeking alternative medicine and popular therapists for them as had done in the previous times in the Egyptians' villages.

Regarding to residence, the results of present study indicated that the highest percentage of school age children in active, passive and no distraction groups were from urban areas. In relation to level of education the results of current study showed that the majority of school age children in active distraction group were in the second level of primary education, while majority of them

in both passive and no distraction groups were in third level of primary education. In relation to diagnosis, the majority of school age children in active distraction group complained of enlargement of spleen while majority of them in both passive and no distraction groups complained of enlargement of liver. Mean duration of hospitalization of school age children in active group was 4.80 ± 1.871 days, in passive group was 3.84 ± 1.344 days whereas in no distraction group was 3.88 ± 1.563 days. There were no statistically significant differences between active, passive and no distraction groups regarding residence, diagnosis and duration of hospitalization but there was a statistically significant difference between 3 groups regarding to level of education.

From points' of view of research investigator that the majority of school age children were from urban areas this reflects the bad effect of living in urban areas than rural areas and unhealthy weather, unhealthy food and faulty attitude of living in urban areas, in the other side, it indicates to appropriateness of caring services in pediatric hospitals, Cairo university which well known by availability of better equipment, apparatus, specialized physicians, nurses and providing appropriate care although those hospitals are governmental and teaching hospitals, which in turn attract people from all over Egypt for treatment of their children's diseases.

Regarding to diagnosis of school age children the majority of them were diagnosed as having enlargement of spleen and liver. From points' of view of research investigator this indicates to increased number of children patients suffering from liver and spleen diseases to the extent it became endemic in Egypt and indicates needs for further researches to determine causes of increased liver and spleen diseases among Egyptians' children especially in urban areas not only rural as was previously well known.

The results of current study explained that mean scores of pain based on the NRS in active group was 2.98 ± 1.041 and in passive group was 4.44 ± 1.044 whereas in no distraction group was 5.20 ± 0.816 and there were statistically significant differences between active, passive and no distraction groups regarding main scores of pain based on NRS. The results of the current study showed that the mean of pain scores of active distraction group is less than both the mean of pain scores of passive and no distraction groups which means effectiveness of active distraction in decreasing pain intensity more than in passive and no distraction techniques.

The result of current study is supported by Greco [11] who found in his study that active distraction helped

children to tolerate discomfort for the longest amount of time than passive and/or no distraction groups. The results of present study match with results of a study carried out by Wohlheiter and Dahlquist [8] who reported in their study that both younger and older preschool/early elementary school aged children demonstrated greater pain tolerance scores during the interactive distraction group, compared with the passive distraction group.

The result of present study is compatible with results of study done by Goldman *et al.* [15] who presented in their study that more children in the active group had a successful first attempt to insert an IV and tolerate its pain compared to the passive group and active child participation in the distraction procedure during angiocath insertion appears to be more effective than passive forms of distraction.

But these results are contradicted with Bellien *et al.* [16] who stated that a passive strategy such as watching TV might be more effective than an active one such as distraction with an interactive toy for decreasing the pain of venipuncture because the child distress interfered with their ability to interact with the distractor.

From points' of view of research investigator this may be related to the school age children in active distraction focused their attention in the activity which they involved in it and being preoccupied by it and pay little attention to painful procedures, vice versa had done in passive group being just viewer and nothing had done with in no distraction group and consequently children in no distraction group were being completely focused on painful procedures.

Regarding to intensity of pain based on WBFS scale the results of present study revealed that there were statistically significant differences between active, passive and no distraction groups in relation to intensity of pain.

This result is supported by Jameson, Trevena and Swain [17] who reported in their study that participants in both experiments had a significantly higher pain tolerance and reported less pain with the active distraction compared with passive or no distraction. They also had greater reduction in pain with active distraction than with passive. The result matched with Dahlquist *et al.* [18] who found in his study that although both distraction conditions were effective in pain threshold and pain tolerance, the interactive distraction condition was significantly more effective.

But this result is contradicted with what was reported by Weiss, Dahlquist [19] who presented in their study that interactive and passive video game distraction appear

to be effective for preschool-aged children during laboratory pain exposure but the two distraction conditions did not differ. These results are also contradicted with Esmaili *et al.* [20] who reported in their study that compared two methods of breathing exercise and listening to music on pain of catheterization at the time of blood transfusion and found that although both methods reduced children's pain significantly, the effect of music was more than breathing exercise.

The results of current study explained that there was no a statistically significant relation between child's age and mean scores of pain based on NRS in active, passive and no distraction groups. The results of current study explained that there was no statistically significant relation between active, passive and no distraction groups regarding child's age and intensity of pain.

The results of current study are in agreement with Wohlheiter and Dahlquist [8] who mentioned in their study that although older children had higher pain tolerance scores overall, there was not a differential response to interactive versus passive distraction based on age. This result is supported by McGrath [21], who reported in his study that the behavior of children during invasive procedures is widely individual and dependent on degree of perceived pain. But this result is contradicted with what was found by Bagheriyan *et al.* [14] who reported in their study that there was a significant correlation between the increase of age and NRS scores

From points' of view of research investigator this may be related to children at any age feel pain of the same painful procedure with different intensity of pain, this difference depends on time of painful procedures, type and duration of painful and past experience of painful procedures.

The results of current study explained that there were statistically significant relations between child's sex, residence, level of education, diagnosis and mean scores of pain based on NRS in active, passive and no distraction groups.

This result is supported with what was found by Bagheriyan, *et al.*, [14] who found in their study that the mean scores of pain based on numerical pain scale in girls was higher than boys.

The current study revealed that there were statistically significant relations between child's sex, residence, level of education, diagnosis and intensity of pain in active, passive and no distraction groups based on WBFS.

From the points' of view of research investigator regarding to sex this may be due to males school age children feel they are stronger than females and they have to endure painful medical procedures and have not to express their feeling of pain. In relation to residence, school age children in rural areas are raised on being more stronger than those in urban areas, this return to nature of the village and in addition, parents of children in these areas raised children to be strong like an adult and should not express their feeling of pain and they have to be like an adult whatever intensity of pain they suffer from.

CONCLUSIONS

The current study concluded that active distraction is effective in decreasing intensity of pain of school age children greater than in passive or no distraction techniques and there were statistically significant differences between mean scores of pain, intensity of pain among active, passive and no distraction groups, this proved the hypotheses of the current study and achieved aim of the current study.

Recommendations: Based on the results of the current study, the following recommendations were reached:

For Children:

- Active distraction technique should be applied for children during painful medical procedures.
- Ministry of industry and ministry of health should provide interactive toys for pediatric hospitals for free to be used during painful procedures.
- Establishment of playing units with interacting toys and provision of employees who can use and demonstrate to children how to use interacting toys and games.

For Nurses:

- Provision of training program for nurses about effectiveness of active distraction in care of children during painful medical procedures.

For Research:

- Replication of such study on a larger and different age group of children to be able to generalize the results of current study.

Table 1: Socio-Demographic Characteristics of School Age Children in Active, Passive and No Distraction Groups (No=75).

Item I	Active distraction group (No=25)		Passive distraction Group (No=25)		No distraction Group (No=25)		F. test	x ²	p. value
	No.	%	No.	%	No.	%			
Sex of infant:									
- Male	11	44	15	60	12	48		2.244	.326
- Female	14	56	10	40	13	52			
Age of children:									
X ±SD	8.344±.96526		8.784±1.1671		8.308±1.133		1.472		.236
-Residence:									
-Urban	13	52	15	60	14	56		.108	.948
-Rural	12	48	10	40	11	44			
-Level of education									
1-1 st level	5	20	5	20	1	4		28.495	.005*
2- 2 nd level	7	28	6	24	5	20			
3-3 rd level	5	20	8	32	10	40			
4-4 th level	4	16	0	0	6	24			
5-5 th level	4	16	2	8	0	0			
6-6 th level	0	0	4	16	0	0			
7-does not go school	0	0	0	0	3	12			
-Diagnosis									
-Renal diseases	5	20	4	16	4	16		.161	.166
-Heart diseases	2	8	5	20	4	16			
-Respiratory diseases	0	0	0	0	3	12			
-Liver diseases	4	16	7	28	6	24			
-Spleen disease	11	44	4	16	4	16			
-Other diseases	3	12	5	20	4	16			
-Duration Of hospitalization:	4.80±1.871		3.84±1.344		3.88±1.563		2.854		.064

* p<0.05

Table 2: Comparison of Mean Scores of Pain on NRS between Active, Passive and no Distraction Groups (No=75)

Item	Active group (No=25) x ± SD	Passive group (No=25) x ± SD	No Distraction group (No=25) x ± SD	F.test	p-value
Mean Scores of Pain (NRS)	2.98 ± 1.041	4.44 ± 1.044	5.20 ± .816	9.732	.000*

* p<0.05

Table 3: Comparison of Intensity of Pain on WBFS between Active, Passive and no Distraction Groups (No=75)

Item	Active group (No=25)		Passive group (No=25)		No Distraction group (No=25)		x ²	p-value
	No.	%	No.	%	No.	%		
Intensity of Pain (WBFS)								
hurts just a little bit	10	40	4	16	0	0	39.097	.000**
hurts a little more	8	32	3	12	2	8		
hurts even more	3	12	6	24	0	0		
hurts a whole lot	4	20	8	32	7	28		
hurts as much as child can imagine	0	0	4	16	16	64		

* p<0.05

Table 4: Correlation between Intensity of Pain on NRS, Intensity of Pain on WBFS and Social Background of Children in Active, Passive and no Distraction Groups (No=75).

Item	Numeric Rating Scale Pain Scores (NRS)	Intensity of Pain on WBFS
Child's age	R=.018 p=.875	R=.042 p=.722
Child's sex	R= 4.346 p=.002*	R= 23.566 p=.000*
Child's residence	R=52.980 p=.000*	R= 11.694 p=.020*
Child's level of education	R= 60.331 p=.000*	R= 60.932 p=.000*
Child's diagnosis	R= 59.352 p=.000*	R= 51.702 p=.000*

* p≤0.05

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