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The Effect of Distraction Technique on the Pain of Dressing Change among 3-6 Year-old Children

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Abstract

Background
Burn dressings, debridement, surgical incisions, skin grafting and physical therapy are some of painful treatments of burn. According to the studies, distraction techniques have a significant effect on patients' pain. The present study was designed and conducted to determine the effect of distraction on pain of dressing change in second degree burn in 3-6 year-old children.

Materials and Methods
This randomized controlled trial study, was conducted on 80 hospitalized children with second degree burn in 2015. Playing a video computer game for children during the dressing change procedure was the intervention for the interventional group. Also the intensity of pain was measured by behavioral pain scale for children (FLCC scale) during dressing. This scale was completed for patients without no intervention in the control group during dressing.

Results
Pain intensity mean in the interventional group (2.575 ± 1.807) had significant changes in comparison with the control group (8.025 ± 1.187) ($P<0.001$). 70% of children in the control group experienced severe pain due to dressing change, but most children in the intervention group (77.5%) had a little pain.

Conclusion
According to the results it seems that distraction intervention has a significant positive effect on the pain of dressing change in children. Further studies are recommended for the development of this technique in health care centers.

Key Words: Burns, Children, Distraction, Pain.

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1- INTRODUCTION

Burn is the most common injury in children under 10 years. According to the World Health Organization and UNICEF (2009) burns from the fire is the cause of 96,000 child deaths per year and the rate of deaths from burns in low and medium-income countries are 11 times more than it in the high-income countries (1). The incidence of burn injury is 6.48 percent of accidents in Iran (2).

Burn injuries and its consequences are health problems in today's society and the main cause of death and disability in children in Iran and other countries, they lead to the imposition of physical, psychological, social and economic injuries to the patient, family and society (3). Burn injuries are often painful and debilitating (4) and the pain caused by severe burns is considered as the worst form of pain. Patients call this pain as a "living hell" or the most fatal pain that they have experienced (5). Burn dressings, debridement, surgical incisions, skin grafting and physical therapy are some of painful treatments of burn (6).

However, the daily care of wounds including dressing removal, debridement (cleaning) and dressing burn again is the main cause of pain in these patients. Numerous physiological, psychological and social risks threat the patients in the absence of pain control (7). Pain relief is the basic need and right of every child and one of the priorities in nursing care (8).

The most common method involves the use of analgesics for pain control with anti-anxiety drugs in the patients. When benzodiazepines are combined with opioids, reduce the pain of burn dressings, but they are usually not sufficient (9).

Narcotics will cause many side effects that the most common ones are constipation, nausea, vomiting and drowsiness while drug-free pain reliever considerations have few side effects and their use is relatively easy and free of charge for the patients; in addition, using them simultaneously with analgesic increases pain relief (10).

According to literature review so far, numerous methods were used for decrease the pain of children. The positive effect of jaw relaxation on pain of dressing changes (11), breathing relaxation technique on burn pain (12) and effect of hypnotherapy on pain (13) were confirmed. But these methods need much experience and presence of experts that have a lot of costs for health units. Distraction is one of the non-pharmacological interventions for pain relief (14).

Playing games is one of the distraction methods to reduce the pain and anxiety associated with hospitalization and medical procedures. Therefore, it appears to be necessary in the children ward of the hospitals. Play therapy is a way to reduce emotional and social stress in children. For 60 years, play therapy has been used as an appropriate method in the treatment of children. One of these games is playing with bubbles-individually or in a group-which is effective in reducing anxiety, anger and stress in children (14).

According to available database, several studies have shown that using distraction techniques including playing games reduce sensory and affective dimensions of pain. These studies included the effect of a distraction method using bubble blowing on the pain of injection practices in school-age children with thalassemia major(15), the effect of play therapy techniques in reducing stress and increasing positive emotions and general compatibility in 9-12 children with leukemia (16), the effect of play therapy on the postoperative pain in school-aged children (7), the effect of distraction methods on the intensity of intravenous cannulation in children with strabismus (17) and the effect of music therapy in reducing the pain associated with painful procedures (18).

But so far any articles about play therapy for children who have been burned have not been published. However, pain management puts the nurses in the burn wards of hospitals under stress and raises the priority of research on burning pain management.

Distraction is applicable by games and without the need for special education and with little facilities for children according to their age and interest. The aim of this study was to determine the effect of distraction on the intensity of pain resulting from dressing change in second degree burn in 3-6 year-old children.

2- MATERIALS AND METHODS

2-1. Study design and population

The present study was a single-blind RCT which aims to determine the effect of distraction on the pain intensity of second degree burn dressing change in 3-6 year-old children admitted to Shahid Zareh Hospital, Sari (the Capital of Mazandaran province-North of Iran) in 2015 (May 2015-September 2015). The study population consisted of all children suffering from second degree burns that were treated in the burn ward of Zareh hospital.

According to the study result (14), the sample size was estimated 40 people in two groups. The sample size was estimated based on a study with mean and standard deviation of pain after distraction in the interventional group 10.7± 7.3 and in the control group 18.9 ± 6.8 (17).

It was calculated with statistical power of 95% and confidence level of 99% in each group that, 40 patients were enrolled in each group (Figure.1).

The Childern selected by accessible sampling and 3-6 year-old children were allocated to control group and distraction group based on the table of random numbers. In this study by a 3 years old child it is meant the beginning of 3 third year to 3 years and 11 months and 29 days and by a 4 years old child it is meant the beginning of fourth year to 4 years and 11 months and 29 days and by 5 years old child it is meant the beginning of fifth year to 5 years and 11 months and 29 days.

2-2. Inclusion criteria

Inclusion criteria were:

- the age of child (beginning of third year to the end of sixth year);
- second degree burns;
- 9-35% body surface burns;
- alertness to place;
- time and person;
- having the ability to communicate;
- not having verbal and auditory disorders, absence of acute and chronic diseases and
- the presence of parents with the child.

In the event of a life-threatening emergency, subjects excluded from the study. Upon receiving the permission of ethics committee of Mazandaran University of Medical Sciences (North of Iran) and hospital officials, the samples were selected from among children who had inclusion criteria.

Researcher introduced himself to the research subjects and after explaining the purpose of the study to the subjects and their parents, getting a written consent form from parents in both groups and presented some explanations about research.

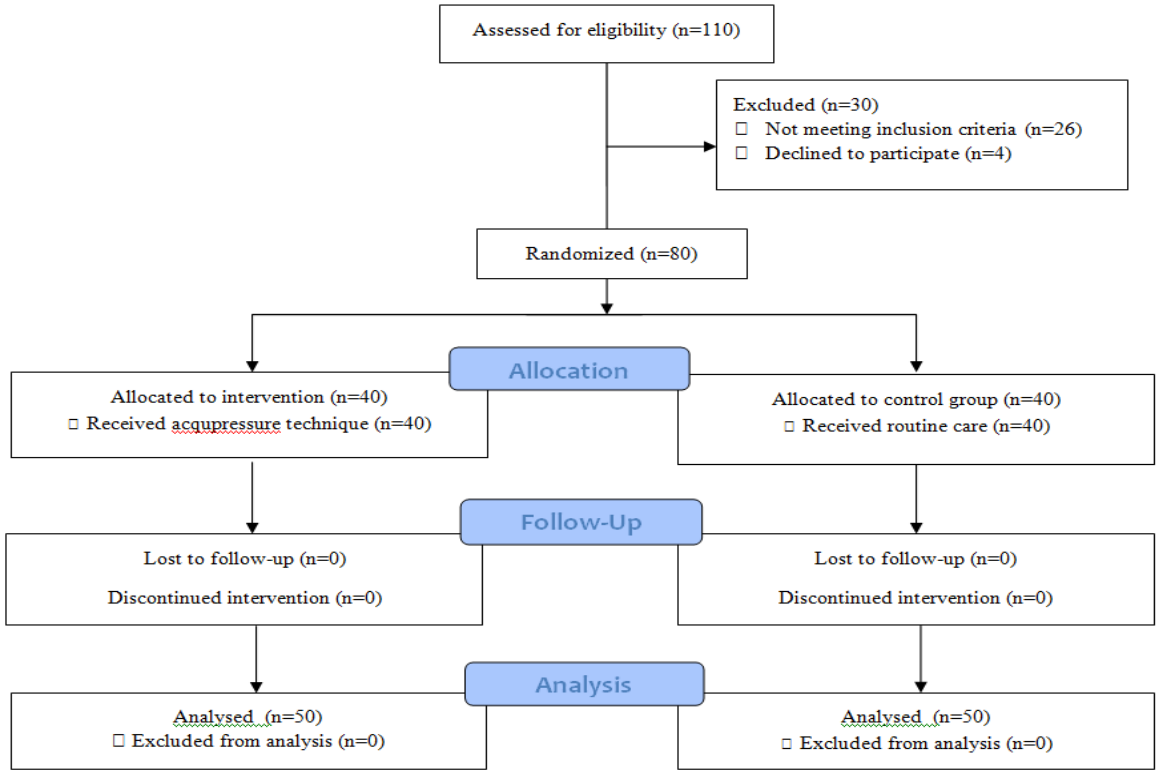

Fig1: Consort diagram

2-2. Clinical Interventions

Dressing changes was usually done during 8 AM-11AM. This procedure was include 3 main phases: 1) Removing clothes 2) Wound debridement 3) Implement of new dressing. For the interventional group, 3 minutes before the dressing (17), distraction started by displaying a game on a portable monitor and continued until the end of dressing change and in the control group, dressing change was done without any intervention. One of the parents attended during the procedure in both groups. Used video was related to Sonic-games that was provided by Sega Company in 2015.

2-3. Instruments

Data collection instruments in this study was demographic and medical information questionnaires (Gender, age, weight, percentage of body burns and the type of burned organ) and behavioral pain scale for children (FLCC scale). Demographic and medical questionnaire was filled out through interviews with one of the parents and patients medical record. Behavioral pain scale for children was observed and recorded from the beginning of dressing change and during dressing in both interventional and control groups. Children's behavioral pain scale is used to determine the severity of pain in children during dressing change based on children's behavioral responses. This scale is composed of 5 sections including face, legs, activity, crying and the ability to relief. Each section accounts for 0-2 scores. Higher scores indicate bigger responses to pain. The score of each section were separately recorded and then were summed to calculate the total score of pain. The range is from 0 to 3 (slight pain), from 4 to 7 (moderate pain) and from 8 to 10 which indicates severe pain (19). The researcher has scored this scale by observing the child's behavior during

the dressing change. Children's behavioral pain scale is a standard instrument and it has been used in several studies, it also is valid (2, 7, 13).

2-4. Ethical consideration

This study was conducted according to the Helsinki Statement (20) and has been approved by the associated university's medical sciences ethics committee. The Iranian Registry of Clinical Trials (IRCT) code of this study is (IRCT2015111425029n1).

2-4. Statistical analysis

Data was analyzed using SPSS- 21.0 (released 2007; SPSS for Windows, SPSS Inc., Chicago, IL, USA). Mean and standard deviation were used to evaluate the quantitative variables (weight, age and the percentage of burns) and absolute and relative frequency was used to evaluate the qualitative variables (gender and the type of burned organ). Independent T-test was used to assess changes in mean pain between the two groups. The chi-square test was used to compare pain intensity between the two groups. In this study, a significant level of $P<0.05$ was considered.

3- RESULTS

The present study was conducted on 80 hospitalized children due to burn with demographic data presented in (Table.1). Age, gender, weight and percentage of burns among children were not significant different in the intervention and control groups ($P>0.05$) (Table.1). Among the children enrolled in the study most of the burn areas were head (12.5 % and 15%, in the intervention and control groups respectively) and front of the chest (12.5 % in both groups).

The mean and standard deviation of the score of behavioral responses to pain in the control and intervention group were 8.025 ± 1.187 and 2.575 ± 1.708, respectively (Table.2). There was a significant difference between the two groups ($P<0.001$). Also, 70% of children in the control group experienced severe pain because of dressing change but most children in the intervention group (77.5%) had a little pain. There was a significant difference found by chi-square test in terms of pain intensity in both groups (Table. 3).

Table1: Demographic characteristics of children in control (n=40) and interventional (n=40) groups

Variables	Interventional Group N (%) or Mean(SD)	Control Group N (%) or Mean(SD)	test	P- value
Gender				
Male	22 (48.9%)	23 (51.1%)	$X^2=0.51$	0.822
Female	18 (51.4%)	17 (48.6%)		
Age				
3 years	19 (59.4%)	13 (40.6%)		
4 years	14 (48.3%)	15 (51.7%)	$X^2=5.51$	0.472
5 years	5 (38.5%)	8 (61.5%)		
6 years	2 (33.3%)	4 (66.7%)		
Weight				
	14.25±1.66	13.73±1.69	t=1.4	0.166
Percent of burn				
	13.03±3.76	13.08±2.96	t=0.06	0.948

Table 2: Comparison the pain mean during the intervention in control and interventional groups

Variable	Mean (SD)	t-test	P- value
Control group	8.025 (1.187)	16.57	0.001
Interventional group	2.575 (1.708)		

Table 3: Comparison the categorical pain intensity during the intervention in control and interventional groups

Variables	Control group	Interventional group	X^2	P- value
	N (%)	N (%)		
Low (0-3)	0	31 (77.5%)		
Average (4-7)	12 (30%)	9 (22.5%)	59.429	0.001
High (8-10)	28 (70%)	0		

4- DISCUSSION

This study showed that distraction techniques had effect on the intensity of pain in children with burn. Pain of burns is very cumbersome. It postpones the repair and healing of the wounds leads to several physiological complications such as ulcers and psychological changes (21). Numerous studies have confirmed positive effects of distraction techniques on Pain caused by a variety of procedures. In a study of adults undergoing flexible bronchoscopy (FB), the effect of environments sounds on reducing the pain of this procedure was confirmed (22). If, when performing painful procedures are not applied appropriate palliative measures, children will imagine all nursing activities and care as being painful and will have this fear with them till adulthood (23). In another study on the adolescents with cancer, a significant reduction in pain and anxiety was reported following the use of distraction techniques (24). Consistent with this study, in another research on children with burns, distraction had a significant impact on reducing the pain of dressing change (25).

Pain in children is not only unpleasant and annoying feeling, but due to lack of ability to predict and understand the causes of pain. Children when faced with pain are confused and do not show proper responses. They may even conceal pain and cause a lack of adequate control of pain by their caregivers (26). In a review article concluded that distraction can have significant effects on the pain of complex medical interventions (27) that is consistent with the present study. The study conducted on burned children. 13 children with the age of 4-12 years were allocated in 2 groups. In interventional group during 6 sessions, a Cartoon video was shown during dressing changes. Children have right to choose between 2 models of cartoons. Also in both groups, 1 hour before the intervention, children have been used Codeine phosphate drug (3 Mg/Kg). According to results, it does not seem that procedures such as cartoons broadcast have powerful and effective impact on the pain of dressing change (28). It seems that factors such as differences in the age range of the two studies, small sample size, taking sedative drug before the intervention and choose different cartoons video are the possible causes of the conflict. Yoo and colleagues investigated the effects of distraction through animation using laptop on the pain of intravenous cannulation in 20 young children, they showed that pain intensity

reported by the children, behavioral responses to pain, cortisol and blood glucose were significantly different in interventional and control groups (29). Windich-Biermeier and colleagues in a study investigated the effects of distraction that is chosen by the children themselves (Like bubble making, exciting books, music, manual video game) on the pain and fear caused by venipuncture of 50 children and adolescents with cancer, pain significantly decreased in the intervention group but there was no significant differences between the groups (30) which the result is countercurrent with the present study. Possible causes of this paradox can be the difference in age (children 5 to 18 years with a mean age of 9.9 years) and type of the toll creating distraction. However in both studies effect on pain was confirmed. In line with the Wang and colleagues (31) reported the effect of watching cartoon movies on the pain of venipuncture in children, he stated that distraction using the five senses in addition to pain reduces the stress caused by medical procedures. Distraction techniques such as the use of toys, bubble machine, playing music and video games are as effective as analgesics and even better than them (32).

4-1. Limitations of the study

The most important limitation of this study was inability to control the children's personality and socio-cultural background that can have effect on experience of pain in children.

5- CONCLUSION

The results indicate that distraction technique used in this study had a good effect on the severity of pain in the studied children. Given the need for pain control and its effects on the course of treatment, further studies are needed to be done. So that non-pharmacological approaches to pain are a viable alternative to analgesic medications in medical centers.

6- CONFLICT OF INTEREST

The authors had not any financial or personal relationships with other people or organizations during the study. So there was no conflict of interests in this article.

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