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Evaluation of the effect of distraction in the two groups of inflating the balloon and mother's armson the pain of venipuncture in children aged 3-6

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ABSTRACT

Children get irritable, restless and excited in response to pain. Most children predict the pain induced by injection and prevent it by non-conformist behavior associated with anxiety before injection. They usually spend a lot of time to accept the injection. Thus, the present study aims to evaluate of the effect of distraction in the two groups of inflating the balloon and mother's arms on the pain of venipuncture in children aged 6 -3. This study was conducted in a cross-sectional way. Sampling was performed in an available and random manner from all children admitted to the pediatric ward (44 patients) of Peymanieh hospital of Jahrom. Data tools consisted of three questionnaires: demographic questionnaire, the scale of pain behavioral study in children and numerical scale to assess pain. Information was conducted by descriptive statistics indicators such as percentage and mean and paired T tests. Mann-Whitney test results showed that there was no significant difference between blowing up balloons group and mother's arm group in terms of the scale of pain behavioral study and numerical scale to assess pain (p -value > 0.05). Performing Distraction program reduces pain resulting from medical procedures in children.

Keywords: distraction, pain, venipuncture.

INTRODUCTION

Pain is derived from the Greek word, "Poen", meaning penalty and punishment [1]. From early childhood, children face with events such as cuts, bruises and sore throat caused by tonsillitis so pain is a part of their lives [2]. There is slim information on the epidemiology of pain. But it is stated that, unlike pain in adults that is important due to economic losses caused by lost working days, children's pain does not have any important social repercussions. That is why there are not sufficient incentives to undertake the necessary research on this issue in children. [2]. Children get irritable, restless and excited in response to pain and may suffer from nightmares, sleep and eating disorders [3]. Most children predict the pain induced by injection and prevent it by non-conformist behavior associated with anxiety before injection. They usually spend a lot of time to accept the injection which creates problems for nurses in injections so that they have to firmly hold and immobilize children. This would lead to unpleasant experiences injection and would have an adverse effect on the child's reaction to the next injection [2]. For children undergoing painful procedures for various therapeutic or diagnostic purposes, the use of medications and non-drug strategies

one at a time form the multi-dimensional process of pain [4]. As mentioned earlier, there are medicinal and non-medicinal ways to prevent and relieve pain and using any of these methods has advantages and disadvantages. Distraction is among non-drug methods that includes focusing attention on stimuli other than pain. This method puts one's consciousness on the sidelines. Thus, if you receive adequate sensory input through the brainstem reticular formation, chosen external emotions such as pain are stopped or ignored [5]. Non-drug treatments can be used before and during painful procedures [6]. Several studies, such as Cohen, showed that using distraction has led to the child's obedience and relieving stress and pain caused by vaccination [7]. On the other hand, bubbling is known as a distraction method [8] that is a combination of rhythmic breathing with visual distraction by watching bubbles [4]. Another method that has been accepted as a method of distraction is touch method. The method is based on the gate control theory. According to this theory, peripheral nerve impulses which include pain are transmitted to the central nervous system. Touch and pain are transmitted through the same path, while touch impulses move faster than the pain impulses and close pain control valve. Therefore, fewer pain impulses get into the brain [9]. It has been shown that this method reduces pain and anxiety in older people and decreases the baby's heart rate and respiratory rate as well [10]. On the other hand, based on the study of Parvizi and his colleagues, it has been found that 90% of nurses have received no special training in the field of reasonable methods of distraction and they tend to apply distraction by stroking and talking [10]. In recent years, many children have been exposed to diagnostic or therapeutic measures which create different levels of pain. Circumcision, immunizations, healing, suturing the wound, venipuncture and blood sampling are among painful techniques that are part of the child's everyday experiences [11]. Venipuncture is one of the most painful invasive procedures that are frequently used in hospitalized patients, outpatients and even at homes, because this method is the basis and introduction in the diagnosis and treatment of most diseases [12]. Many clients, especially children, consider this action painful and frightening; because this action includes a forced invasion and threats to physical and mental space of the child [13]. Lack of pain relief during invasive procedures will have serious negative consequences. Especially when the pain is caused by needle insertion, children's memory and recalling painful procedure will lead to severe psychological responses [such as crying, paddling severely and preventing the injection] and physiological responses [e.g., increased heart rate and blood vessel spasms] during the subsequent experiences of the Child [12], which would interfere with the injection and prompt it to frequently be unsuccessful. Most of the time nurses have to limit the child's movements for injections. This intensifies the fear and pain in children and causes unpleasant experience, fear of injections and of hospital and of medical team and will disrupt the relationship between the child and the treatment team [14 and 15]. Sometimes, due to fear of injections, the children do not express his pain and disease for his illness injection or considers injection as the punishment for his mistakes [16]. Therefore, the pain of venipuncture will cause physical and mental stresses and must be relieved. Thus, the present study aims to evaluate of the effect of distraction in the two groups of inflating the balloon and mother's arms on the pain of venipuncture in children aged 6-3.

MATERIALS AND METHODS

This study was conducted in a cross-sectional way. Sampling was performed in an available and random manner from all children admitted to the pediatric ward of Peymanieh hospital of Jahrom. After obtaining permission from the Vice Chancellor for Research and Ethics Council of Jahrom University of Medical Sciences, the researcher attended in the study environment and explained the research objectives for the authorities and was engaged to carry out the sampling. The study population included all children admitted to the emergency of Peymanieh and Motahari medical centers hospitals in Jahrom. The samples of the study were randomly divided into 2 groups. Group 1: (Mother's arm), Group 2: (inflating balloon). Data tools consisted of three questionnaires: demographic questionnaire including (age, gender), and the questionnaire of the scale of pain behavioral study in children and numerical scale to assess pain.

Criteria for inclusion in and exclusion from the study include:

Inclusion criteria: Age 6-3 years, experiencing the first venipuncture, not feeling pain for venipuncture (it means severe disease-induced pains that the child suffer from: such as severe stomach ache, the pain of fracture, tumor, etc. that interfere with the pain of venipuncture), being unable to communicate and having full consciousness, consciousness to the place, time and person, and

Exclusion criteria: The failure of the first attempt to venipuncture, seizures, any life-threatening emergency situation, receiving painkillers before venipuncture.

Before the study, the consent of the study samples was obtained and they will be notified that there is no need to mention the name on the questionnaire and they were assured that the information obtained from the questionnaires was used only for the purposes of the study.

Demographic questionnaire will be completed by the researcher through an interview with the child or with the child's parent. The scale of pain behavioral study in children will be observed and recorded during procedures in both groups. The scale of pain behavioral study in children will be used to determine the severity of venipuncture pain through the child's behavioral reactions. This scale consists of 5 parts such as the face, legs, activity, crying and the liability of relief. Each part accounts for the 2-0 score. Points higher are a sign of further reaction to pain. The score of each part is recorded separately and then the 5 parts are added together to calculate the total score of pain. The score range will be from zero (i.e., lowest) to 10 (i.e., highest). By observing the child's behavior, the researcher will be scoring this scale. The reliability of this tool was measured in previous research. After completion of venipuncture, the severity of pain was measured by means of numerical pain. This tool was shown to the child and he was asked to choose his pain from numbers 0 to 10. The linear zero-to-10 scale of pain is a standard scale to assess pain. The validity and reliability of this tool have been approved in other studies. The nurse responsible for venipuncture, size, type and the manufacturer of IVC, the area of performing venipuncture and environmental conditions will be identical in all venipuncture.

Information will be conducted by descriptive statistics indicators such as percentage and mean etc. and appropriate statistical tests such as Anova and paired T-test using SPSS software version 21.

RESULTS

In this cross-sectional study, 44 6- to 3-year-old children from Jahrom medical centers participated. Respondents aged 3 to 6 years old. Their average age was 1.14 ± 4.29 . Table 1 shows the age variable frequency.

Table 1: Prevalence of variable age

Minimum	Maximum	Standard Deviation	Mean	
66	3	14.1	29.4	Age

Table 2: Descriptive Indicators Research Groups in the scale of pain behavioral study in children and numerical scale to assess pain

numerical scale to assess pain				scale of pain behavioral study				
Maximum	Minimum	Middle	Mean	Maximum	Minimum	Middle	Mean	Group
9.00	.00	3.00	4.05	5.00	2.00	3.00	3.64	Inflating balloons
8.00	2.00	5.00	4.59	5.00	3.00	4.00	3.86	Mother's arm

Kruskal-Wallis test results show that research groups were the same in terms of age and there was no significant difference between them ($p\text{-value} > 0.05$). Table 3 compares the research groups in terms of age using the Kruskal-Wallis test.

Table 3: Comparing research groups in terms of age using the Kruskal-Wallis test

p-value	Standard deviation	Mean	Number	Group
0.736	1.14	4.18	22	Inflating balloons
	1.14	4.36	22	Mother's arm

Kruskal-Wallis test results also show that the research groups are consistent in terms of gender and there was no difference between them ($p\text{-value} > 0.05$). Table 4 compares the research groups in terms of gender using chi-square test.

Table 4: Comparison of research groups in terms of gender using chi-square test

p-value	Gender				Group
	Female		Male		
	Percent	Number	Percent	Number	
0.814	59.1%	13	40.9%	9	Inflating balloons
	54.5%	12	45.5%	10	Mother's arm

Mann-Whitney test results showed that there was no significant difference between blowing up balloons group and mother's arm group in terms of the scale of pain behavioral study and numerical scale to assess pain ($p\text{-value} > 0.05$).

Table 5 shows the comparison between the inflating balloons group and the mother's arm group in terms of behavioral pain scale and numerical scale.

Table 5: Comparison between the inflating balloons group and the mother's arm group in terms of behavioral pain scale and numerical scale

p-value	numerical scale to assess pain			p-value	scale of pain behavioral study			Group
	Middle	Standard Deviation	Mean		Middle	Standard Deviation	Mean	
0.181	3.00	2.38	4.05	0.400	3.00	1.09	3.64	Inflating balloons
	5.00	1.47	4.59		4.00	0.64	3.86	Mother's arm

DISCUSSION

the present study has aimed to evaluate of the effect of distraction in the two groups of inflating the balloon and mother's arms on the pain of venipuncture in children aged 6 -3. In this chapter, the results of data analysis are discussed and possible explanations for the results presented. Then, some limitations and suggestions are offered for future research. Distraction is a technique for pain relief and should be considered due to applicability, ease of use and ease of implementation and be used for other pediatric patients who require frequent injections. According to the findings, there was no statistically significant difference between pain and gender. In Sparks' research that was conducted on children aged 4 to 6 (17), it was shown that small children and females reported more pain than older children and males during the administration of DPT vaccine. However, ANOVA test between pain and age and gender of pain and pain intensity showed no statistically significant difference. To confirm the findings, in the study also Alavi *et al.*, no statistically significant difference was observed between age and severity of pain associated with venipuncture (18). Clipper and his colleagues in their study in 2002 on 7- to 13-year-old children found that there is a significant relationship between numerical pain intensity with numeric scale and gender (19). Perhaps, one reason for the difference in the results of various studies has been the type of age groups that have been studied. In the present study, there was no significant difference between the blowing up balloons group and mother's arm group in terms of the scale of pain behavioral study and numerical scale to assess pain. According to the results of Sparks' research named "Removing Opps from children injection" adapted using distraction (touch and bubble) to reduce the pain of children and showed that both distraction methods had significant reductions in pain intensity. Based on his results, there was no statistically significant difference between the two groups, but the difference between the intervention group and control group was statistically significant (17). In another study conducted by Tanabe, it was showed that distraction, in comparison to ibuprofen and the standardized treatment, has led to higher reduction of pain in patients (20). The study of Kalani tehrani in Shiraz with the aim of determining the effect of EMLA cream and distraction (music) on the severity of pain in thalassemia children showed that distraction (music) and EMLA cream had an influence on the balance of physiological parameters (respiration and pulse), but had no significant effect on blood pressure in children. And he concluded that, because distraction costs much less than EMLA cream and because this cream is not available to public in pediatric wards, distraction can be a good alternative to EMLA cream (21). Vince Gill and colleagues in their study concluded that: using toys as a distraction is more effective in reducing mild to moderate pain during venipuncture, since children have difficulty concentrating with severe pain (22). The results of the study of Caprilli and colleagues in Italy that was conducted on the effect of music on children's stress and pain when blood samples were taken, suggest that pain in the experimental group, compared with the control group, was significantly lower (23). Vessey *et al* (1998) also conducted a study in order to examine the effect of distraction technique on children during venipuncture. Their study showed that distraction technique significantly reduces pain during venous blood sampling, compared to the control group (12). In their study, Vosoughi *et al* (1389) examined the effects of bubbling distraction on physiological parameters and pain intensity of intravenous venipuncture in children aged 6-3 years. They concluded that distraction through bubbling decreases physiological responses and pain intensity of intravenous venipuncture in children aged 6-3 years. Mac Lal *et al.* (2001) in their study exploring the background effect of distraction on pain of intravenous venipuncture in children who had received placebo or EMLA cream, showed that distraction was effective on pain and heart rate and that children under the intervention distraction have less heart rate and less pain (25). The study of Hassanpour and his colleagues in Isfahan to determine the effects of the two non-pharmacological methods of pain control, *i.e.*, cold therapy and distraction, on pain severity in children and physiological parameters, showed similar results in terms of breathing and heart rate. It means distraction was more effective in adjusting physiologic indices and in reducing pain reduction (26).

CONCLUSION

The results of research conducted in the field of distraction show that performing a distraction program reduces pain resulting from medical procedures in children. Therefore, we can reduce the effects of a destructive experience of painful and stressful procedures with a variety of methods of distraction in children who experience a lot of pain during painful procedures at diagnosis, treatment and control of their illness.

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