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Non-pharmacological Interventions for Needle-related Procedural Anxiety in Children with Thalassemia

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Abstract

Background: The purpose of the present study was to assess the efficacy of non-pharmacological interventions on the anxiety among thalassemic children undergoing venipuncture.

Patients and Methods: This was a clinical trial on 60 thalassemic children aged 6-12 years undergoing venipuncture. Children were randomly divided into three groups: control, bubble making and regular breathing exercise. The anxiety level was assessed by anxiety self-reported scale before and after of catheter insertion. Kruskal-Wallis and Mann-Whitney U tests were used to compare the mean score of anxiety between groups.

Results: The mean anxiety score before venipuncture in control, bubble making, and regular breathing exercise groups was 31.7, 30.78, and 29 respectively. After venipuncture, the mean anxiety score was 41.50, 29.45 and 20.55, respectively. These findings indicated a significant difference in the mean anxiety scores between the three studied groups after the venipuncture. However, there was no significant difference between the mean anxiety score in the two distraction groups (bubble making and regular breathing exercise).

Conclusion: Needle-related procedural anxiety can be significantly reduced by using distraction. Bubble making and regular breathing exercise can be effective on the anxiety during venipuncture and might be considered for other minor invasive procedures in children. These non-pharmacological interventions require minimum effort and time and may be cost-effective and convenient nursing interventions that could be used easily in clinical settings.

Key words: Anxiety, distraction, thalassemia, venipuncture.

Introduction

Thalassemia major is one of the most common genetic disorders with no permanent cure [1]. It is more commonly seen in the Mediterranean basin, Southeast Asia, India and China [2]. Iran is also on the thalassemia belt [1]. As it is a chronic disease, children with thalassemia major should be constantly under treatment using blood injections to survive. The number of patients with thalassemia in Iran is estimated to be 20,000 patients and the carriers are about 3 million people [3].

Getting adapted to the invasive care and treatments is an important issue for children, especially those who have chronic diseases and experience many painful procedures [4]. It has been found that around half of children hospitalized in hospital settings get anxious by seeing needles. They believe that the pain they suffer from the injections is horrifying [5].

Anxiety is an unpleasant vague feeling that can be determined by symptoms such as palpitations, perspiration, shortness of breath, etc.[6]. When confronting treating procedures; children show various degrees of anxiety. The nursing care can be planned for through identification of the anxiety[7]. If the anxiety is not identified, it causes stress in the long run which can bring about harmful consequences for children and reduce their cooperation during the treating process [7, 8].

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To reduce anxiety, different methods such as medications, psychotherapy, distraction, biofeedback and relaxation are used [9]. A non-medical method for reducing stress and anxiety is distraction. Distraction includes getting children involved in a variety of activities which help them concentrate on something other than pain and anxiety [10]. There are some examples of distraction such as listening to music, singing, playing, watching TV, bubble making, and three-dimensional images. Several studies have proved that using different distraction ways as independent nursing functions are effective in reducing the pain and anxiety among children. Dahlquist al. did a research to determine the effect of distraction on reducing the pain and anxiety caused by injection procedures [11]. Their research results suggested that using various distraction techniques such as listening to music could reduce the pain and anxiety in children with different diseases. Rohi et al. performed a study to determine the effect of music on abdominal surgery preoperative anxiety level. The results suggested that listening to music can reduce anxiety [12].

Breathing exercise and bubble making are simple, cheap and harmless distracting methods to reduce anxiety. This study was performed to compare the effects of these two distraction methods on the anxiety caused by the invasive procedure of intravenous catheter placement in thalassemic children between 6 and 12 years old.

Patients and Methods

Sixty 6 to 12 year old children with thalassemia from Kerman province, south east Iran, participated in this clinical trial, convenience sampling was used to choose the samples and they were randomly put in three groups. Inclusion criteria consisted of minimum age of 6 and maximum age of 12, awareness of space, time and person, and the ability to communicate verbally. The exclusion criteria included children with physical problems (verbal, mental, vision and hearing), mental disorders, use of anxiety-reducing drugs before venipuncture and a need for more than once catheter placement.

In order to control the effect of nurses' proficiency level on children's anxiety, only one nurse cooperated in this study. She was skilled in children's venipuncture procedure and worked in the morning shift in our thalassemia center. This research was approved by the research department of Kerman University of Medical Sciences. The children and their parents orally accepted to take part in the research. A demographic information questionnaire was filled by the researcher by interviewing each child.

To measure the anxiety, Pierei Anxiety Self-rating Scale was utilized. This instrument consists of 7 painted cartoon faces with a number below each one which makes a numerical scale from 1 to 7. Thereby, subjects are led to choose a face similar to their feelings. It starts with the question "Which one are you?" Children choose a face based on their feelings in the presence of the researcher before and after executing the distraction program. Pierie estimated the reliability of this instrument to be 82% [13], while this was found to be 95% by Ravanipoor et al. [14].

Injection was performed in the first group without any distraction. In the second group, a distraction method (bubble making) was used. A bubble maker toy (a train which moves while whistling and giving out bubbles instead of smoke) was shown to children from two minutes before the venipuncture and continued to the end of the procedure. In the third group, another distraction method (regular breathing exercise) was used. Having been taught the correct way of breathing exercise by the researcher, the children were asked to take a deep breath and whisper the word 'hey' when exhaling. A second time, they were asked

Table 1: The mean anxiety score before and after intervention in three groups of participants..

Mean Score	Group				
	Control	Bubble making	Breathing exercise	Statistical test	Result
The mean anxiety score before intervention	31.72	30.78	29	Kruskal-Wallis	P= 0.8
The mean anxiety score after intervention	41.50	29.45	20.55	Kruskal-Wallis	P= 0.000

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to deeply inhale and while exhaling, whisper the word 'ho' and then repeat it. Children did regular breathing exercises from one minute before the injection and during the venipuncture until the IV cannula was fixed. After venipuncture, children's anxiety was measured by anxiety self-assessment scale. To analyze the data, descriptive statistical tests (mean, standard deviation, percent, etc.) and inferential tests (chi-square, paired t-test, independent t-test, and in case of abnormality of the data, corresponding non-parametric tests) were used.

Results

The average age in the bubble making group was 9.55 years, in breathing exercise group 10.25 years, and in the control group 8.9 years respectively. No significant difference was observed among the studied children in three groups considering their mean age (P=1.27). The three groups were also similar based on the following variables: mother's education, father's education, mother's occupation, father's occupation, birth rank, family income and family size.

The average of anxiety score was 31.72 in control group, 30.78 in bubble making group, and 29 in breath taking exercise group before the start of procedure (P= 0.8). The mean of anxiety score was 41.50 in the control group, 29.45 in the bubble making group, and 20.55 in the breathing exercise group after the intervention. Kruskal-Wallistest test showed a statistically significant difference between the three groups after the intervention (P=0.000) (Table 1).

There was a statistically significant difference between the mean of anxiety level between the control and bubble making groups after the intervention (P= 0.02) (Table 2). The difference between the breathing exercise and control groups was also significant (P=0.01); however, no significant difference was observed between the bubble making and breathing exercise groups (P= 0.954) (Table 3).

Discussion

The results of this study indicated that the mean of anxiety level significantly decreased in children who used the bubble maker machine and breathing exercise in comparison with the control group. Redd et al. in their study, found that the use of distraction during chemotherapy was effective in reducing anxiety in children with cancer [15]. Cohen et al. played a movie for school children who were being vaccinated; which caused their anxiety level to significantly decrease in comparison with the control group [16]. Caprilli et al. indicated that the

Table 2: Comparison of the mean anxiety score before and after intervention between the bubble making and the control group.

Mean Score	Group			
	Bubble making	Control	Statistical test	Result
The mean anxiety level before intervention	30.78	31.72	Mann Whitney	P= 0.53
The mean anxiety level after intervention	29.45	41.50	Mann Whitney	P= 0.02

Table 3: Comparison of the mean anxiety score before and after intervention between the breathing exercise and the control group.

Mean Score	Group			
	Breathing exercise	Control	Statistical test	Result
The mean anxiety level before intervention	29	31.72	Mann Whitney	P= 0.52
The mean anxiety level after intervention	20.55	41.50	Mann Whitney	P= 0.01

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mean of children's anxiety score in the intervention group significantly decreased after distraction [17]. All these studies suggest the positive effect of different distraction methods in reducing the anxiety during various procedures which is in line with our findings.

Although bubble making and regular breathing exercise, both significantly reduced the anxiety caused by venipuncture with no statistically significant difference some children asked for the bubble maker the next time they had venipuncture. If the bubble maker toy is not available, nurses can spend a short time teaching the regular breathing exercise to children and use this method to relieve the anxiety while applying painful procedures.

Conclusion

Needle-related procedural anxiety can be significantly reduced by using distraction. Bubble making and regular breathing exercise can be effective on the anxiety during venipuncture and might be considered for other minor invasive procedures in children. These non-pharmacological interventions require minimum effort and time and may be cost-effective and convenient nursing interventions that could be used easily in clinical settings.

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References

1. Bagheriyan S, Borhani F, Abbaszadeh A, Ranjbar H. The effects of regular breathing exercise and making bubbles on the pain of catheter insertion in school age children. Iran J Nurs Midwifery Res. 2011;16(2):174-80.
2. Low LC. Growth of children with beta-thalassemia major. Indian J Pediatr. 2005;72(2):159-64.
3. Alavi A, Zargham A, Abd Yazdan Z. Nam nabati M. The comparison of distraction and EMLA cream effects on pain intensity due to intravenus catheters in 5-12 years old thalassemic children. Journal of Shahrekord University of Medical Sciences. 2005; 7(30): 15-9.
4. Uman LS, Chambers CT, McGrath PJ, Kisely S. A systematic review of randomized controlled trials examining psychological interventions for needle-related procedural pain and distress in children and adolescents: an abbreviated cochrane review. J Pediatr Psychol. 2008;33(8):842-54.
5. Hasanpour M, Tootoonchi M, Aein F, Yadegafar G. The effect of two non-pharmacologic pain management methods for intramuscular injection pain in children. Acute Pain 2006; 8(1): 7-12.
6. Amir M, Bandura A, Barlow D, Anxiety Disorder. In: Kaplan A, Sadok B. Comprehensive Text Book of Psychiatry. 7th ed. Philadelphia: Lippincott, 1999:812-818.
7. Kapnoullas J. Nursing interventions for the relief of preoperative anxiety. Aust J Adv Nurs. 1988;5(2):8-15.
8. Swindale JE. The nurse's role in giving pre-operative information to reduce anxiety in patients admitted to hospital for elective minor surgery. J Adv Nurs. 1989;14(11):899-905.
9. Christensen J, Fatchett D. Promoting parental use of distraction and relaxation in pediatric oncology patients during invasive procedures. J Pediatr Oncol Nurs. 2002;19(4):127-32.
10. Wong DL, Hockenberry MJ, Wilson DA. Wong's nursing care of infants and children. 8th ed. St. Louis, Mo.: Mosby/Elsevier; 2007, P. 220.
11. Dahlquist LM, Busby SM, Slifer KJ, Tucker CL, Eischen S, Hilley L, et al. Distraction for children of different ages who undergo repeated needle sticks. J Pediatr Oncol Nurs. 2002;19(1):22-34.
12. Rohi GH, Rahmani H, Abdolahi A, Mahmodi GH. The Effect of Music on Anxiety and Physiological Variable of Patient before Abdominal Surgery. Journal of Gorgan University of Medical Science 2005; 7(1):75-78.
13. 13- Kain ZN, Mayes LC, Caldwell-Andrews AA, Karas DE, McClain BC. Preoperative anxiety, postoperative pain, and behavioral recovery in young children undergoing surgery. Pediatrics. 2006;118(2):651-8.
14. Ravanipour M, Pour Esmail Z, Memarian R. Ravanipour M, Pour Esmaeil Z, Memarian R. Effects of therapeutic touch before venipuncture on anxiety of school age children in medical centers of Bushehr city in academic year 1998-9. Modarres Journal of Medical Sciences 2003;6(2): 74-65.
15. Redd WH, Jacobsen PB, Die-Trill M, Dermatis H, McEvoy M, Holland JC. Cognitive/attentional distraction in the control of conditioned nausea in

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pediatric cancer patients receiving chemotherapy. J Consult Clin Psychol. 1987;55(3):391-5.
16. Cohen LL, Blount RL, Cohen RJ, Schaen ER, Zaff JF. Comparative study of distraction versus topical anesthesia for pediatric pain management during immunizations. Health Psychol. 1999;18(6):591-8.
17. Caprilli S, Anastasi F, Grotto RP, Scollo Abeti M, Messeri A. Interactive music as a treatment for pain and stress in children during venipuncture: a randomized prospective study. J Dev Behav Pediatr. 2007;28(5):399-403.

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