

Original Research Article

The Effect of Relaxation Training on the Pain after Surgery in 8-12 year old Children admitted to the Surgical Units of Shiraz University of Medical Sciences in 1393-94

Sedigheh Montaseri¹, Nooshin Beheshtipour², Fahimeh Safizadeh³, Giti Setoodeh⁴, Najaf Zare⁵, Hamid Reza Foroutan⁶

¹Department of Pediatrics, Instructor, Academic staff, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran

²Department of Pediatrics, Instructor, Faculty member, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran.

³Nursing (Pediatric) M. A. Student, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran

⁴Department of Psychiatric, Instructor, Academic staff, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran

⁵Department of Statistics, Associate Professor, Academic staff, Shiraz University of Medical Sciences, Shiraz, Iran

⁶Department of Pediatrics, Professor, Academic staff, Shiraz University of Medical Sciences, Shiraz, Iran

***Corresponding author**

Sedigheh Montaseri

Email: sedighmontaseri@yahoo.com

Abstract: Pain is one of the common problems after surgery in children that non-pharmacological methods of pain relief have been useful in some forms of the pain but the impact of these techniques, such as relaxation therapy on postoperative pain in children, is unknown. So the aim of this study was to evaluate the effect of relaxation training on the pain after surgery in children admitted to the surgical units of Shiraz University of Medical Sciences in 2014-2015. The Materials and Methods in This study are a clinical trial, included 104 eight to twelve year old children who underwent surgery and were randomly divided into two groups of control and intervention. Used tools included demographic characteristics questionnaire, a pain rating scale and routine care. The intervention group was trained by Benson relaxation techniques. The control group received routine care. The pain score was measured in both groups, before, one and twelve hours after intervention. The data was collected by SPSS software and analyzed using the chi square test, Fisher's exact test, independent T, one way ANOVA test and Pearson correlation coefficient. The results showed that there was a statistically significant difference in an hour and twelve hours after intervention in both groups. In the intervention group who had received relaxation training in addition to the routine care, reported less pain in comparison with the children in control group who received routine care ($p < 0.05$). In Conclusion the Relaxation can reduce the pain after surgery in the children.

Keywords: Pain, Children, Training, Relaxation

INTRODUCTION

Pain is an unpleasant sensory and emotional experience that is caused by actual or potential tissue damage. Pain is caused by many disorders and treatments. Because the nurses spend more time with patients suffering from the pain than other members of the health care team so they need to understand pathophysiology, physiological and psychological results of the acute and chronic pain and the way to treat them. Pain control is considered as an important part of the care that to

emphasize its importance and increasing awareness of the health team about pain control, America's Pain Society (APS) called it as the fifth vital sign. By calling pain as the fifth vital sign, pain assessment should be examined automatically and like blood pressure and pulse measurement.

The experience of the pain in a person is influenced by several factors, including past experiences of the pain, anxiety, culture, age and the expectations of

the patient from the pain. These factors may influence the increase or decrease of the patient's perception of the pain, reduce or increase the pain tolerance and the pain response [1]. Illness and hospitalization are the first crises that children face during life and due to the changes in natural health and environmental conditions; they are potential to the crisis caused by the disease and hospitalization. [2] The children also experience a lot of the pain that one of them is the pain after surgery [3]. Millions Of patients worldwide are operated each year and most of them report not relieved pain after the surgery [4]. 75 percent of the children have pain in the surgery day, and 40 percent of them experience severe pain [3]. Although significant progress has been made in the care of the children after surgery, but a lot of care for the treatment of illness, traumatic care are painful and uncomfortable. Therefore pain is one of the most important nursing diagnoses in children undergoing surgery and all of the therapists including medical and nursing team should prioritize the pain control [5]. The experience of pain in children is under the influence of age and level of maturity, cause of pain, the nature of pain and the child's ability to express it in a meaningful form and pain is often associated with fear, anxiety [6]. Several factors contribute to inadequate control of pain after surgery that among these, the false beliefs and expectations from the patients and not ongoing review of pain can be mentioned [3]. One of the most important obstacles that cause inadequate pain control in children is the existence of this belief that the children do not feel the pain and that's why one of the problems involved in the pain of the children is the pain control. Fortunately, nowadays increasing information about the physiology of the pain and the knowledge of pharmacology and pharmacodynamics of its controller medications make the pain control easier [7]. Pain relief is a basic need and right of the child that is considered as one of the nursing priorities [2]. Pain relief methods can be classified into two categories of pharmacological and non-pharmacological. One way to reduce pain in children is the use of cognitive behavioral interventions that has low side effects, is cheap and easy to use. These actions include muscular relaxation, illustration, distraction and presentation training that in this regard chosen strategy should be tailored to the child's age and severity of pain. Illustration, distraction, and presentation training that in this regard chosen strategy should be tailored to the child's age and severity of pain [8]. The pain is most associated with fear and anxiety, and many non-pharmacological techniques such as relaxation, guided imagery and skin irritation provide adaptation strategies that would reduce the perception of the pain and make the pain more bearable, reduce the anxiety and increase the analgesic effect and reduce the amount of medication required [9]. Progressive muscle relaxation technique is one of the possible treatments that was introduced and employed in 1983 [10]. This technique is one of the nursing interventions that beside the positive impact, its

learning is easy and it can be considered as a complementary therapy [11]. Relaxation is a technique in which a person causes himself to feel comfortable via contraction and then unscrew specific group of muscles in a progressive condition [12], and affects the pain by reducing the demand for tissue oxygenation, reducing the levels of chemicals such as lactic acid, destroying skeletal muscle tension and the release of endorphins [13]. Since the surgery is a stressful event for the child and unrelieved pain increases this tension and due to the vulnerability of the children, their role in the future of the country and that half of the population belongs to this group and providing their health is in fact providing the health of the society and because the nurses as members of the care team have the most important role in pain relief, they should take means or measures to reduce it. With these explanations and due to the lack of adequate pain control after surgery, especially in children and the impact of pain control on patients' lives and since the performed researches were rarely about the children, we decided to perform relaxation training and study its effects on pain relief of 8-12 year old children. It is hoped that this study would take effective steps to reduce the children's pain and spread non-pharmacological treatments in nursing pediatric. And ultimately lead to the development of health in the person, family and the society.

METHOD

This study is a sample of clinical trials, intervention study. The researcher admitted to Namazie hospital and Ghadir, Mother and Child hospital after the approval of the project and obtaining the necessary permission from the Research Department of Shiraz University of Medical Sciences. The statistical population was all children hospitalized in pediatric surgery of these two hospitals. The samples were chosen among all children admitted to Namazie and Ghadir Therapeutic Educational Centers dependent on Shiraz University of Medical Sciences. Sampling is randomly with permutation blocks. So that one number is selected randomly from the random numbers and then 52 blocks made of 2 were selected consecutively as AB (0-4) and BA (5-9). Finally, 104 patients were selected for the present study (52 for the intervention group and 52 for the control group). The sample size was estimated 52 patients in each group according to the objectives and the study type and with reference to the previous studies in this area and NCSS software and with regard to the first type of error 0.5 and the power of 90 percent. Inclusion criteria included: 1. 8-12 years old children, 2. signing of informed consent by parents, 3. lack of a clear mental retardation and mental health problems in parents and children, 4. child is literate, 5. there is no history of surgery, 6. lack of vision and hearing problems in the child; and the reluctance of parents to continue to collaborate in this research and the presence of a disease, or an acute problem that prevents the continuation of

cooperation of the child were the exclusion criteria. Used tools include: Demographic characteristics questionnaire and Visual Analogue Scale (VAS).

Demographic characteristics questionnaire: This form contains information about the age of the child, gender, history of surgery, history of physical disease, history of failing at school, type of surgery, time of surgery, received common drugs, received painkillers and having severe pain before surgery that was completed by parents through interviews and to determine the validity of information, content validity was used. This means that at least two of faculty members studied the demographic data forms and then expressed their opinion about it.

Visual Analogue Scale (VAS): It is the numeric scale of pain that is marked from 0 to 10. (0) means that there is no pain and [10] means the most severe pain. We ask the child to choose the number that seems to be his pain. This tool is valid to measure the intensity of pain score for school children and is suitable for the study of pain and nurses can use it easily and quickly [14]. The validity and reliability of Visual Analogue Scale has been confirmed in many studies both inside and outside the country [15]. The children in the intervention group, in addition to routine care which includes analgesics (a dose of 10 mg/kg Apotel and 0.1 mg/kg Petedin) if required, were introduced to the relaxation method that was trained individually during 2 sessions, each session 20 minutes, with an interval of 4 hours a day before surgery along with listening to a CD in which the procedure was explained by the researcher and after each session to ensure the child's learning, 10 minutes for questions and answers was considered. The intervention by the child himself and in the presence of the researcher was conducted for 20 minutes. An hour later from entering the patient to the unit and the pain score of the child was measured before intervention, one hour after intervention and twelve hours after intervention then its impact was measured on the score of the severity of his pain in three above phases. If the VAS is above 4, Apotel and Petedin analgesics were given to the child according to the routine of the unit and he was removed from the experimental group. The control group received routine care and pain assessment was performed at all stages such as the group. At the end to observe ethical principles, the educational CD containing relaxation techniques was also given to the control group.

Common statistical methods in analysis the information were used to analyze the information. The

relationship between qualitative variables was measured with Chi-Square test. Repeated measures test was used in this study to examine the severity of pain score. 0.05 was considered as the level of significance and SPSS data analysis software version 16 was used in the analysis of data.

RESULTS

In This study, 104 children were studied. (52 patients in the intervention group and 52 in the control group) were placed. Most of the participants in the experimental group (56 percent) and in the control group (52 percent) were females. Most of the samples in the intervention group (52 percent) were literate. The average age was 9.9 years in the intervention and control groups. There was no statistically significant difference in terms of demographic characteristics according to the chi-square test, Fisher's exact test and independent t-test ($P > 0.05$). The mean of pain intensity score of the participants in the experimental and control groups by independent t-test had not statistically significant difference before the intervention ($p > 0/05$). According to the findings of Table 1 in the experimental group, the mean of pain intensity score was observed to have 1.7 score decrease an hour after the intervention than before it while in the control group it was observed to have 0.2 score increase an hour after the intervention than before it and this difference is statistically significant ($p < 0.05$).

According to the findings of Table 2 in the experimental group, the mean of pain intensity total score was observed to have 2.28 scores decrease twelve hours after the intervention than before it while in the control group it was observed to have 0.17 scores increase twelve hours after the intervention than before it and this difference is statistically significant ($p < 0.05$).

The results of the present study showed that there is no significant relationship between the pain intensity scores mean before and one hour after the intervention with gender ($P = 0.098$). There is no significant relationship between the pain intensity score mean before and twelve hours after the intervention with gender ($P = 0.109$). There is no significant correlation between the pain intensity score mean before and one hour after the intervention with age ($P = 0.110$). There is no significant correlation between the pain intensity score mean before and after twelve hours from intervention with age ($P = 0.104$).

Table 1: The comparison of patients pain intensity scores mean in the two experimental and control groups before the intervention and one hour after the intervention

| Variable | Time | Before the Intervention | | One Hour after the Intervention | | P-Value | | |
|----------------|------------------|-------------------------|--------------------|---------------------------------|--------------------|---------|-------|------------|
| | Statistics Group | The Mean | Standard Deviation | The Mean | Standard Deviation | Time | Group | Time/Group |
| Pain Intensity | Experimental | 8.7 | 1.1 | 6.9 | 1.6 | 0.041 | 0.033 | 0.046 |
| | Control | 8.8 | 1.1 | 9 | 1.2 | | | |

Table 2: The comparison of patients pain intensity scores mean in the two experimental and control groups before the intervention and twelve hours after the intervention

| Variable | Time | Before the Intervention | | Twelve Hours after the Intervention | | P-Value | | |
|----------------|------------------|-------------------------|--------------------|-------------------------------------|--------------------|---------|--------|------------|
| | Statistics Group | The Mean | Standard Deviation | The Mean | Standard Deviation | Time | Group | Time/Group |
| Pain Intensity | Experimental | 8.7 | 0.1 | 6.4 | 1.5 | 0.0003 | 0.0001 | 0.0002 |
| | Control | 8.8 | 0.1 | 8.6 | 1.0 | | | |

DISCUSSION AND CONCLUSION

Pain is a complex and mental issue. The size of the pain depends on the personal experience, social factors, individual anxiety level, understanding of the person and the person's ability to describe the type and severity; while the emotional aspects of pain also play an important role in controlling it [16]. The children also experience a lot of the pain that one of them is the pain after surgery. [3]Therefore pain is one of the most important nursing diagnoses in children undergoing surgery and all of the therapists including medical and nursing team should prioritize the pain control [5].

This study was performed to evaluate the effect of relaxation training on the children intensity of pain after surgery. The results indicate the effect of relaxation training on reducing the pain intensity score mean after surgery. In the study of Huth *et al.*; which aims to determine the effect of positive imaginations before and after Tonsillectomy in children 7 to 12 year old, patients who have received interventions reported less pain after surgery? These findings are in line with our results in the present study [17].

Bassam Pour in a study showed that indoctrination, embodiment and talking as three methods of relaxation methods has been effective in reducing the anxiety of patients before and after use [18]. The results of the study of Barati *et al.*; (1388-89) suggested a positive effect of play therapy as a nursing intervention, in pain relief after surgery in school age children [19].

The results of the study of Ghamari Givi *et al.*; (1391) also showed that two methods of distraction and relaxation can be used as non-pharmacological methods besides other pediatric pain control methods and make the

children to be more compromise with the pain [20]. Gupta *et al.*; pointed out that using distraction by a musical ball can reduce the pain of venipuncture in school-age children under elective surgery [21].

A study was conducted by Blin *et al.*; in Italy to examine the effects of distraction and deactivate during venipuncture in 69 6-12 years old children. These children were randomly divided into three groups of control, active distraction (in which the mothers performed the active distraction) and inactive distraction (in which the children spent watching television) and the amount of the pain was reported by the child after the intervention. The mean of the amount of reported pain in the control group, active distraction and inactive distraction were respectively 23.04, 17.39 and 8.91. Scores reported by children revealed that the method of distraction by watching television was more effective in reducing the pain in children than two other groups which is in line with the present study [22]. Also in the study of Farrokhnia *et al.*; which was done in 1389 under the title: the survey of the effect of cognitive interventions in reducing the intensity of pain, distress and improving the quality of life of children with cancer in Tehran, the results showed that cognitive interventions and distraction, were effective in reduction the reported pain in children with cancer, that is in line with the present study [23]. In the study of Breyer *et al.*; which was performed on children under went tonsillectomy, analysis of the data by repeated measures design revealed that the average score of anxiety were significant only with the intervention [24]. It seems that the reason for harmonization of this finding with previous findings is the effect of relaxation training to control pain on children's pain relief after surgery. The usage of results of this study is for allpediatric hospitals. It seems that by

doing relaxation, Individual perception from the pain changes and the intensity of feeling reduces. The results of these researches expand the nursing activity area in connection with the children's pain relief and add on the quality of nursing care. In total, according to the findings of this study it can be said that designing and implementing relaxation educational programs based on the needs of children can be effective in improving the intensity of children's pain after surgery. Relaxation techniques to relieve the patient's pain provides pain relief, helps achieve greater energy and reduces the limitation of movement in patients [25]. The results of this study show the importance of patients' relaxation training in the health care system. Therefore nursing managers can promote these programs by further planning and they can train some people to implement these programs better so that they can provide relaxation training to patients to reduce the pain. It is suggested that other studies can be done in future to compare the effectiveness of relaxation training on other age groups, to evaluate the effect of this treatment on other children's mental components, to evaluate the relaxation training effects on pain relief of patients with long-term follow-up period or to evaluate the effect of this type of treatment and compare it with other therapies.

ACKNOWLEDGEMENT

The researchers express their heartfelt thanks to the personnel and officials of Namazie hospital and Ghadir, Mother and Child hospital who assisted us in the implementation of the project and also the Research Department of Shiraz University of Medical Sciences for their financial support of the project.

REFERENCES

1. Brunner LS, Smeltzer SCC, Bare BG, Hinkle JL, Cheever KH; Brunner & Suddarth's textbook of medical-surgical nursing: Lippincott Williams & Wilkins; 2010.
2. Hockenberry MJ, Wilson D, Wong DL; Wong's Essentials of Pediatric Nursing9: Wong's Essentials of Pediatric Nursing: Elsevier Health Sciences; 2012.
3. Kokki H; Current management of pediatric postoperative pain. 2004.
4. Paice JA, Ferrell B; The management of cancer pain. CA: a cancer journal for clinicians. 2011;61(3):157-82.
5. Ball JW, Bindler RC, Cowen K; Child health nursing: Prentice Hall; 2013.
6. Hockenberry MJ, Wilson D; Wong's Nursing Care of Infants and Children Multimedia Enhanced Version: Elsevier Health Sciences; 2013.
7. Kehlet H, Wilmore DW; Evidence-based surgical care and the evolution of fast-track surgery. Annals of surgery. 2008;248(2):189-98
8. Cohen LL, MacLaren JE, Fortson BL, Friedman A, DeMore M, Lim CS, *et al.*; Randomized

- clinical trial of distraction for infant immunization pain. Pain. 2006;125(1):165-71.
9. Perry SE, Hockenberry MJ, Lowdermilk DL, Wilson D; Maternal child nursing care: Elsevier Health Sciences; 2014.
10. Sutherland G, Andersen MB, Morris T; Relaxation and health-related quality of life in multiple sclerosis: the example of autogenic training. Journal of behavioral medicine. 2005;28(3):249-56.
11. Conrad A, Roth WT; Muscle relaxation therapy for anxiety disorders: It works but how? Journal of anxiety disorders. 2007;21(3):243-64
12. Dayapoğlu N, Tan M; Evaluation of the effect of progressive relaxation exercises on fatigue and sleep quality in patients with multiple sclerosis. The Journal of Alternative and Complementary Medicine. 2012;18(10):983-7.
13. Kwekkeboom KL, Gretarsdottir E; Systematic review of relaxation interventions for pain. Journal of Nursing Scholarship. 2006;38(3):269-77.
14. Coll AM, Ameen JR, Mead D; Postoperative pain assessment tools in day surgery: literature review. Journal of advanced nursing. 2004;46(2):124-33.
15. Hojjati H, Aghamolai M, Fayazi S, Dehghani A; comparison the effect of two methods, patient controlled analgesia and intramuscular injection after abdominal surgery in patients to Amir Al Momenin hospital in Ahwaz. edical Surgical Nursing Journal. 2012;1(2).
16. Scheuber K, Becke K; outpatient anesthesia for children. Anesthesiol Intensivmed Notfallmed Schmerzther 2012; 48(3): 192-9.
17. Huth MM, Broome ME, Good M; Imagery reduces children's post-operative pain. Pain. 2004;110(1):439-48.
18. Bassampoor S; The effect of relaxation techniques on anxiety of patients with myocardial infarction. Qazvin Uni Medic Sci J (JQUMS). 2005;9:1-2.
19. Barati F; Evaluate the effectiveness of play therapy on postoperative pain in school-age children admitted to children Hospital for surgery. Martyr Beheshti University of Medical Science and Health Service. 2011;72(73).
20. Ghamari Givi H, Sharee A, Rick Mohammadipoor N, Abolghasemi A, MN; the evaluation Efficacy of relaxation techniques and distraction to reduce pain in children in general hospital Magazine culture, Counseling and Psychoterapy. 2011;1.
21. Gupta D, Agarwal A, Dhiraaj S, Tandon M, Kumar M, Singh RS, *et al.*; An evaluation of efficacy of ballon inflation on venous cannulation pain in children: a prospective, randomized, controlled study. Anesth Analg. 2006; 102(5):1372-5.
22. Bellieni CV, Cordelli DM, Raffaelli M, Ricci B, Morgese G, Buonocore G; Analgesic effect of

- watching TV during venipuncture. Archives of disease in childhood. 2006; 91(12):1015-1017.
23. Farrokhnia M, Shahidi SH, Fath abadi J; Study of Cognitive Invention Effect in Redusing pain intensity, Distress and Improvement of Situation-Related life quality of children with cancer. 2011; 3(2): 35-42. .
 24. Brewer S, Gleditsch Shl, Syblik D, Tietjens ME, Vacik H.W; Pediatric anxiety : child life intervention in day surgery, Journal of pediatric Nursing, 2006; 21(1): 13-22.
 25. Sutherland G, Andersen MB, Morris T; Relaxation and health-related quality of life in multiple sclerosis: the example of autogenic training. Journal of behavioral medicine. 2005;28(3):249-56.