

Effect of Pre-Operative Psycho-educational Interventions on Anxiety and Pain in Children Undergoing Tonsillectomy in Shiraz Southern Iran

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Abstract

Background: Excessive anxiety and stress can affect children's physical and psychological health, hinder their ability to cope with surgery, encourage their negative behavior in association with health care, and may also inhibit their post-operative recovery. This study was conducted to determine the effects of pre-operative psycho-educational interventions on post-operative anxiety and pain in children undergoing Day- Case tonsillectomy.

Methods: A quasi-experimental pre-post test follow up control group design was used for 199 children aged 9 to 12 years old who were admitted for Day-Case tonsillectomy unit, along with their parents during a 12-month period. In a randomized method, 100 children were divided into the experimental group receiving psycho-educational interventions, and 99 children who were assigned to the control group receiving routine information preparation. The anxiety level of children was measured using children Spielberger State Anxiety Inventory (SSAI) and the post-operative pain level of the children was assessed by using the Visual Analogue Scale (VAS).

Results: The children in the experimental group reported lower state anxiety scores in 4-time points of post-operative periods. There was no difference in children's post-operative pain between the two groups.

Conclusion: The study provides empirical evidence in support of the effectiveness of using psycho-educational interventions for preparation of children for surgery.

Keywords: Children; Psycho-educational intervention anxiety; Pain; Day-Case tonsillectomy

Introduction

Tonsillectomy is amongst the most commonly reported ear, nose and throat (ENT) operations performed on children. Although this procedure bears only small complication risks, it can be a stressful and anxiety-provoking experience. Children may perceive the need for surgery as punishment for wrongdoing, be intimidated by separation from home and the strange environment, be threatened by masked

physicians, and feel uncomfortable about the uncertainty of "going to sleep". Lumley *et al.* studied pediatric ENT patients and concluded that most of the children were behaviorally and/or physiologically anxious; moreover, 11% of their patients developed relatively severe behaviour problems in the first 2 weeks after the surgery.¹ Excessive anxiety and stress can affect children's physical and psychological health, hinder their ability to cope with surgery, encourage their negative behaviour in association with health care, and may also inhibit their post-operative recovery.

As surgical techniques and anesthetic agents have greatly improved in recent years, pediatric day surgery procedures are increasingly being performed throughout the world. The introduction of day surgery has increased parental responsibility, with re-

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Received: January 10, 2009

Accepted: May 17, 2009

gard to the care of their child during pre – and post-operative periods.²

The review of literature reveals that lack of understanding about the upcoming procedures, unfamiliarity with the hospital environment, and uncertainty about the illness and its treatment are the major factors contributing to parental stress.³ Therefore, parental involvement is important in the pre-operative psycho-educational preparation of their child for surgery.

The provision of short pre-operative information education via brochure is the most common method of preparing children for surgery in Iran. Nevertheless, most pre-operative preparations focus on procedural information for the parents while the children's psychological needs have seldom been taken into consideration.²

During the past decade, there has been an increase in the use of psycho-educational intervention to help children cope with the stress of hospitalization.^{2,4-8} The purpose of the current study was to examine the effect of psycho-educational intervention on the outcome of children undergoing Day- Case tonsillectomy.

Materials and Methods

The study was carried out in the only Day-Case Children Hospital in Shiraz, Fars province, southern Iran. To examine the effects of psycho-educational intervention, we employed a quasi-experimental, pre-post test follow up and control group design. A single-blind technique was used and the research nurses were unaware of the treatment allocation. The eligible participants were randomly assigned into the experimental and control groups, after the pre-intervention baseline measurement undertaken by the research nurses.

All the children admitted to the day surgery unit of the study hospital for elective tonsillectomy and meeting the inclusion criteria for the study were invited to participate in the research. The inclusion criteria were age between 9 and 12, undergoing elective Day-Case tonsillectomy, speaking Persian (both children and their parents being able to speak and read Farsi), children being accompanied by their parents (either mother or father) on the day of surgery, no gross developmental, physical, or psychological problem, not having previous hospitalization or surgery after 18 months of age, and living in a close distance from hospital. In the experimental group, the parents of the children had to be willing and able to come for post-surgery measurement 1 month after the surgery. In order to enhance the

integrity of the study, the interventions and measurements were done by the same person.

The sample size was calculated to obtain sufficient power to detect differences between the groups. To predict this effect size of differences in the study outcomes between the two groups at a 5% significance level ($p < 0/05$) and a power of 0.80, 199 subjects in both groups were normally required, so, 100 subjects were randomly assigned to the experimental and 99 to the control groups.

In the control group, children and their parents received routine information on the usual care when the children were admitted to the day surgery unit (in the morning of the day of surgery). Routine information preparation comprised of giving a brochure about essential post-operative care at home. The content which consisted of oral explanations about reasons, date and time of the surgery, and post-operative care of the child at home was standardized by day surgery unit personnel.

In the experimental group, beside receiving the usual care, children and their parents received psycho-educational interventions in the morning of the day of surgery. In order to ensure that the interventions would have no effect on the control group, preparation was made separately for the groups. Psycho-educational interventions used in this study consisted of structured activities comprised of showing a 20-minute videotape illustrating the experiences of a rabbit along with a girl hospitalized for tonsillectomy. Its scenario was developed by a multidisciplinary team, including a pediatric psychiatrist, psychologist, psychiatric nurse and ENT surgeon. The scenario shows various events that the rabbit and the girl encounter when they referred for this type of surgery. The scenes include the pre-operative examination, the physician's explanation on why surgery is necessary, admission to the hospital and meeting the nurse, coming to the operating room, waking up and feeling pain after the operation, meeting each other (the rabbit and the girl), having a postoperative examination and discharge from the hospital. The text of scenario was written according to psychosocial and cognitive development of children in a child-adequate language, containing information conveyed to the audience in a supportive and anxiety-reducing manner. After watching the videotape, the researcher answered all the children and their parents' questions and gave the parents a booklet containing additional information such as peri-operative care, alarm signs after tonsillectomy and the emergency telephone numbers and

health-related issues to prepare parents psychologically for care of their children. The whole psycho-educational interventions lasted approximately 1 hour. The psycho-educational interventions were implemented in small groups of six children with their parents.

In order to ensure consistency and eliminate any discrepancies in the study, only one surgeon did all the operations with the same procedural technique (cold dissection and bipod cattery legation) and anesthetic method.

The state anxiety level of children was measured, using children Spielberger State Anxiety Inventory (SSAI) consisting of 20 items, scored from 1 to 3, with the total possible scores ranging from 20 to 60. Higher scores indicated greater anxiety. The SSAI is an international accepted measure which has been used in a range of comparable studies for assessing the level of children's state anxiety.^{2,3,9} State anxiety can be described as a temporal and transient emotional state with a changing intensity. Elevations in state anxiety are normally evoked when the child is exposed to stressful situation. This scale was used after consultation with a psychologist.

The test-retest reliability coefficient for the SSAI was 0.68 for boys and 0.65 for girls. The internal consistency of the scale was 0.93 in Persian children aged 9-12 years.¹⁰

The children's post-operative pain level was assessed, using the Visual Analogue Scale (VAS). The VAS is a valid and reliable instrument used for school-age children and adolescents.¹¹ The VAS consists of a horizontal 10 cm line on a piece of paper having descriptive words such as "no pain" at one end and "worst pain" at the other end. The VAS is one of the most widely used pain measurement tools¹² because it is easy to administer, and is a valid method for measuring subjective feelings. Several studies have reported the VAS as a sensitive measure of and change in pain.^{12,13} It has also been shown to be valid when used concurrently with McGill pain questionnaire scores, which is a well-established measure of pain.¹⁴ In this study, the VAS was completed by the mothers, who were looking at their children's faces at specific times (after breakfast, lunch, dinner and also before sleep).

Approval for the study was obtained from the Ethics Committee of Shiraz University of Medical Sciences. Written consent was obtained from the parents, after they were informed on the purpose of the study. The children and their parents were informed that they had the right to go out of the study at any time

and were assured of the confidentiality of the study.

The data collection for the study was mainly divided into four phases: on the day of surgery before operation (pre intervention), one day, ten days and one month after surgery. On the day of surgery before operation, demographic data and state anxiety scores of children (baseline data) were collected. One day, ten days and one month after the surgery, the state anxiety level of the children was assessed. The pain levels were collected continuously from the day after the surgery to the tenth day after the surgery, and intermittently on the 28th, 29th and 30th days after the surgery, each day in 4 stages: after breakfast, lunch, dinner, and before sleep.

The statistical package for social sciences (SPSS) software, version 11.5 for windows (Chicago, IL, USA) was used for data analysis. The homogeneity of the experimental and control groups was assessed, using inferential statistics (independent t-test and χ^2). Independent t-test was used to determine any difference in the mean scores of the children's state anxiety and post-operative pain between the experimental and control groups. The impact of demographic and clinical variables was tested with the use of various analyses for the children's level of anxiety and pain. Repeated Measurement Design was conducted on the variables of anxiety and pain. A *p*-value of <0.05 was considered significant.

Results

Information on the demographic and baseline characteristics (pre-operative anxiety scores) of the experimental and control groups is presented in Table 1. The results revealed that the experimental and control groups were similar with respect to the age and gender of children, educational level of the parents, economic status of family and baseline state anxiety scores for children, suggesting a high level of homogeneity of variance between the two groups in this study.

The mean and standard deviation of the state anxiety scores in children across the three time periods after operation (post intervention) are shown in Table 2.

The results indicated that there was a statistically significant difference between the two groups after the operation. According to Tables 1 and 2, from pre to post-operation there was a statistically significant reduction in the anxiety level in the experimental groups, while the anxiety level of the control group

Table 1: Comparison of experimental and control groups on demographic and baseline characteristics (n=199)

	Experimented (n=100)	Control (n=99)	P value
Gender of children			
Male	42	51	>0.123
Female	58	48	
Education attainment (father)			
< 12 school years	68	68	0.084
≥ 12 school years	32	31	
Education attainment (mother)			
< 12 school years	72	74	>0.571
≥ 12 school years	28	25	
Economic status			
Upper	19	17	0.833
Medium	74	71	
Lower	7	11	
	Mean (S.D.)		
	Experimental(n= 100)	Control(n= 99)	
Age of children	10.26 (1.14)	10.39 (1.24)	>0.424
Children's state anxiety scores (before surgery)	42.5 (7.76)	41.6 (6.95)	>0.382

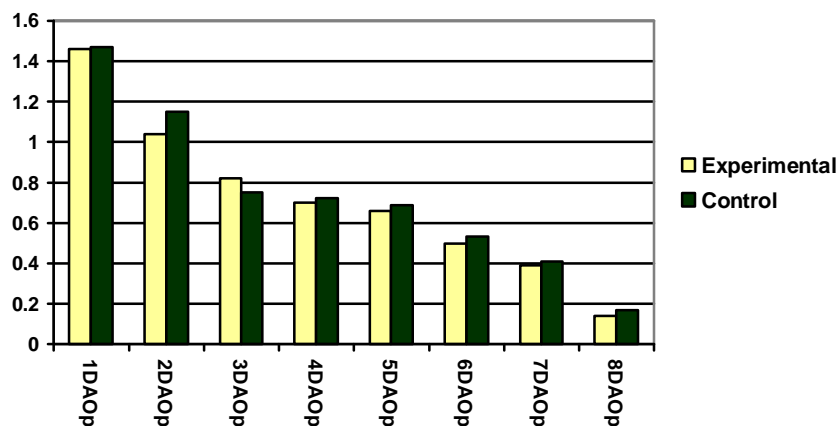
Table 2: The mean anxiety scores in children across the 3- time periods after tonsillectomy (n=199)

	Mean (S.D)		P value
	Experimental (n=100)	Control (n=99)	
1 day after surgery	37.22 (6.37)	46.60 (8.24)	<0.001
10 day after surgery	32.28 (5.68)	41.17 (6.74)	<0.001
1 month after surgery	29.28 (6.16)	38.35 (6.29)	<0.001

significantly increased after surgery. Pain ratings on the Visual Analogue Scale decreased from day to day post-operation. Neither the pair wise tests nor the ANOVA showed any significant group differences (Figure 1).

Discussion

The current study showed that the psycho-educational interventions are effective in improving post-operative outcomes of children. The results showed



Aop = after operation

Fig. 1: The comparison of the mean post-operative pain scores for children in the experimental and control groups

that psycho-educational interventions before Day-Case tonsillectomy reduced post-operative anxiety in the experimental group. The result of this study indicates that children receiving therapeutic interventions reported less negative emotional behaviors identical to Li and Lopez study, 2006,² supporting also another research stating that preoperative preparation reduces children's anxiety.¹⁵

Early research showed that lack of control over upcoming medical procedures was one of the major sources of stress for children undergoing surgery.^{16,17} Besides, according to the theory of cognitive appraisal, stress and coping,¹⁸ the individual's evaluation of the threat is influenced by his/her perception of control over a potential threat. Therefore, it was reasoned that if a child believed that he/she had adequate control over the upcoming surgery, the perception of threat would decrease. The major objective of psycho-educational interventions in this study was to enhance children's personal control. It was believed that through familiarizing the child with personnel and the setting such as recovery and operating room and ENT ward, using a doll (rabbit), he/she would have fun, be desensitized to potential stressful situations, be able to alleviate his/her anxiety towards threatening procedures, and also get instilled with a sense of control over the situation in which he/she was involved. This could probably explain why children in the experimental group of this study had statistically significant lower state anxiety scores during post-operative periods.

Oral analgesics were prescribed for children post-operatively on request. Children were encouraged to ask for analgesics whenever they felt pain. The results of the study showed that the post-operative pain level in children ranged from mild to moderate in the first day after surgery. Although children in the experimental group had lower pain scores than those in the control group, the result was not statistically significant. One possible explanation lies in the difficulty in determining whether children's post-operative pain could be expected to respond to psycho-educational interventions. The results showed that psycho-educational interventions had more effect on the psychological outcome (anxiety level), while the outcome measures of post-operative pain may be less responsive to these psychological interventions.

Another possible reason is that the surgery for children scheduled in day surgery units is generally regarded as a minor surgery when compared with children that required prolonged hospital stay. Children having major or more invasive surgeries usually

experienced more pain post-operatively due to the presence of a larger operative wound. On the other hand, most children having minor surgery in day surgery units may only experience minor to moderate pain in their post-operative period. As a result, the pre-operative nursing interventions effect on the post-operative pain scores of children may be comparatively low. In addition, the perception of pain is susceptible to extensive cultural factors. Tsoi and Pryde,¹⁹ highlighted that Chinese children were influenced by socio-cultural values, such as obedience and social conformity, and inhibition of self-expression. Consequently, Chinese children might suppress frank and free expression of pain. The result of the current study was in contrast with that of the study conducted by LaMontage *et al.* (2001);⁹ who found that post-operative pain of children undergoing orthopedic surgery was decreased with their anxiety reduction. So the relationship between pre-operative and post-operative anxiety and pain needs further explorations.

The limitation of this study was that all the data were collected in one setting, and only Day-Case Tonsillectomy was included. This might limit the ability to generalize the results. Another limitation is that a homogenous sample of children aged 9-12 years was recruited in this study. It is, therefore, not clear whether children below this age range can also benefit from the psycho-educational interventions as younger children are particularly vulnerable to the stress of surgery. So different age groups are recommended for further studies.

Notwithstanding the potential limitations, this study has addressed a gap in the literature by systematically researching the effects of psycho-educational interventions on the outcomes of children undergoing Day-Case tonsillectomy and has extended the data collection to one month after the child was discharged home. The most important contributions of this study are the empirical evidence to support the effectiveness of psycho-educational interventions of children for surgery.

The results of the present study provide empirical evidence of the benefits of incorporating psycho-educational interventions in the pre-operative periods, thereby charting a path towards promoting holistic and quality care. It is anticipated that the findings will not only contribute to promoting the nurses' accountability and responsibility for caring their patients through evidence-based practice, but will also facilitate the development of more autonomy in the advancement of nursing practice.

Acknowledgments

This study was supported financially by Shiraz University of Medical Sciences. The authors would like

to thank the nursing staff at Dastgheib Children Hospital for their valuable help and cooperation.

Conflict of interest: None declared.

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