

## Reduction of Preoperative Anxiety in Children Using Non-Pharmacological Measures

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### Abstract

Several studies have shown that anxiety in children prior to surgical interventions has a negative effect on post-hospitalization recovery. The objective of the proposed project is to reduce anxiety in children prior to major outpatient surgery using non-pharmacological measures (costumes, games, magic tricks, jokes). These measures are to be used from the moment the children are admitted to hospital (the same morning of the surgery) until anaesthetic induction in the operating room. According to our results, the use of hospital clowns has been proven to reduce psychological discomfort in children in a hospital setting.

**Keywords:** Preoperative anxiety; Children; Hospital clowns

### Introduction

Being hospitalized is an extremely distressing event for a child. Several studies have shown that anxiety in children prior to surgery has a negative effect on post-hospitalization recovery [1]. Distress before surgery has been associated with short- and long-term consequences, including risks of emergence delirium and maladaptive postoperative behaviors such as separation anxiety and eating disorders [2].

Maladaptive postoperative behavior such as enuresis, difficulties in food intake, apathy, introversion and sleep alterations can be consequences of preoperative anxiety [3].

Anxious behavior can be considered a reaction to the varying experiences of children being hospitalized in different services according to their medical diagnosis. Anxious behavior is linked to socialization caused by the child's efforts to avoid the pain of being separated from his/her parents. If a child suffers from a disease, this will cause stress, and the psychological functions that the disease inevitably provokes can influence its development. Children need to experience a wide range of emotions such as happiness and affection. The nervous system is extremely involved in this process. Not only is the nervous system connected to the immune system, it is also essential for appropriate immune function.

Another key factor that associates emotions to the immune system is the influence of hormones that are released due to stress. Catecholamines (adrenaline and noradrenaline) and cortisol, among others, obstruct immune cell function. Stress overrides immunological resistance, supposedly in an attempt to conserve energy and give priority to the immediate emergency in order to survive [4].

Freud as well as Piaget considered playing to be a valuable and important activity as it aids in the relief of tension and in the

expression of feelings such as anger, anxiety or frustration, allowing children to regulate their emotions and communicate using different behaviors, thoughts or needs. Since then, many professionals have used it in different settings using various techniques and theoretical approaches as it constitutes an alternative therapy for children that allows them to express themselves without limits [5].

Therefore, many studies have aimed to relieve anxiety by using various psychological techniques with children about to undergo surgery. These techniques include parental presence during anaesthetic induction, design of behavioral programs, music therapy or acupuncture. [6,7]

Hospital clowns are a current resource being used in Spain and other countries in the reduction of anxiety in children in a healthcare context [8]. The effect of nurses in costumes on preoperative anxiety in children about to undergo an intervention will be studied.

### Background

The worry and fear experienced by children prior to medical procedures has fostered research into factors which trigger such reactions, as well as the design of programs that prevent or minimize the appearance of emotional alterations.

Pharmacological and behavioral measures have been used in hospital settings to reduce emotional discomfort in children. Pharmacological measures refers to the use of medication to reduce levels of such discomfort, however this can lead to unwanted side effects in some cases [3].

During the recovery period at home, children suffering from anxiety took, on average, significantly larger amounts of analgesics than those who did not have anxiety. Children with anxiety also had a higher incidence rate of delirium compared to those with no anxiety (9.7% as opposed to 1.5%), as well as a higher incidence rate of preoperative anxiety and sleep alterations [9].

Therefore, preoperative anxiety in small children who undergo surgery is associated to a more painful postoperative recovery and a higher incidence of sleep alterations among other effects.

Most frequently used behavioral or psychological techniques include surgery preparation programs, parental presence before entering the operating room and the use of music and humour [3].

In other studies questionnaires were used as well as the IPAT-AS Anxiety Scale (Institute of Personality and Ability Testing-Anxiety Scale). These studies showed that there were socioeconomic and educational differences between those parents who accompanied their children of their own accord, those who telephoned and those who did not join in the preoperative program. Those parents who had expectations of the

program shown the highest differences on the reduction of anxiety. The anxiety scale revealed that the anxiety of those mothers who did not take part in the preoperative preparation program was the highest of the three groups. [10]

## Justification

At present, humour and laughter are behavioral techniques frequently used to reduce fear, stress and anxiety in a hospital setting. The use of hospital clowns is an example of programs being used which are based on humour to reduce psychological discomfort in children in a hospital setting. There has been a considerable increase of hospital clowns in healthcare settings in recent years, especially in paediatrics.

The following is a list of clown associations in Spain that work in hospitals[1]:

- La sonrisa médica (Mallorca)
- Payasospital (Valencia)
- Saniclow (Madrid)
- Pallapupas (Barcelona)
- Tiritas (Granada)
- Pupaclowns (Murcia)

Our hospital does not use such associations; our aim is to assess whether nurses who use games and humour techniques are able to reduce preoperative anxiety in children about to undergo major outpatient surgery.

The specialities responsible for programmed surgery in children at the La Inmaculada hospital in Huércal-Overa, Almería, are otorhinolaryngology and urology. According to our hospital information system 113 children underwent surgery in 2010.

- Of these, 93.8% where surgical otorhinolaryngology interventions with 89.6% of these being tonsils and adenoids.
- The urology service was responsible for 6.2%, with 85.7% of these being circumcisions.

We believe that this study can be relevant for the scientific knowledge of this population group and for its preoperative requirements. We are aware that this approach is novel in our hospital setting and presents a challenge for the research team; one which we take on board with great interest.

## Problem statement

Preoperative anxiety (anxiety regarding the imminent experience of surgery) in children is a common phenomenon which is associated

with negative behavior that occurs during surgery (for example, agitation, crying, spontaneous urination and the need for physical restraint during anaesthetic induction). This anxiety is also associated with the appearance of maladaptive behavior following surgery including postoperative pain, sleep disorders, conflicts in the parent/child relationship and separation anxiety. These reasons have led to research in the treatment or prevention of child preoperative anxiety and, possibly, the reduction of negative behavior after surgery.

## Methodology

### Working hypothesis

The use of nurses employing non pharmacological measures reduces preoperative anxiety in children.

### Objectives

General: To reduce anxiety in children prior to major outpatient surgery using non-pharmacological measures.

Specific: To determine whether there are differences as regards to age or gender.

### Design

This is a quasi-experimental study.

The sample size was 30 children aged between 3 and 12 years, who had undergone elective surgery. Of these, 15 took part in the program carried out by nurses prior to surgery (experimental group) and 15 did not (control group). The study included children aged between 3 and 12 who were in the anaesthesia room for otorhinolaryngology and urology services.

The following were excluded from the study:

- Children who had difficulties understanding the questionnaire due to mental or physical disabilities.
- Children aged over 12 months who had been admitted and/or undergone surgery in the past, in order to exclude those who may have increased sensitivity or previous negative experiences.
- Children undergoing pharmacological treatments which may alter perception or sensitivity.

In the experimental group, two nurses carried out non-pharmacological techniques (costumes, games, magic tricks, jokes) from the moment the children were admitted to hospital (the same morning of the surgery) until anaesthetic induction in the operating room. In the control group, the children were not visited by the nurses involved in the study and the usual protocol was followed.

Prior to entering the operating room, both groups underwent a preoperative anxiety assessment carried out by a research team nurse using the modified Yale observational scale (EAPY-m Yale Preoperative Anxiety Scale Modified, Kain and colleagues 2006) In this scale, rankings below 30 indicate that there is no anxiety.

Children were admitted in the study in the anaesthesia room, in order of arrival and only if they fulfilled all inclusion criteria. A nurse explained to parents the process of the study being carried out, providing information on the techniques to be used in the experimental group. As the children were minors, all parents who agreed to take part in the study were given an informed consent and were asked to fill out a questionnaire on their child's preferences and

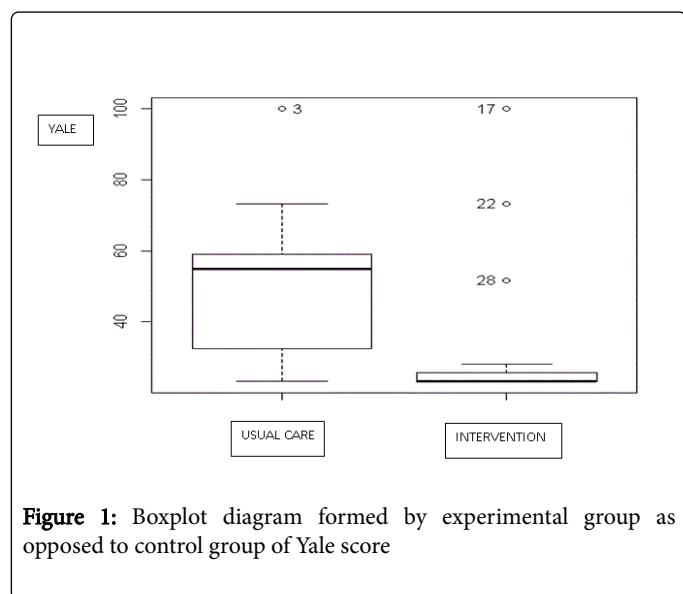
fears in order to determine the best way of approaching each child during the entire process. Parents were asked not to say anything about the study to their child in order to avoid bias and so that their child could belong to either group. The children were entertained by another member of the research team while parents were being informed about the study.

The first 15 children admitted formed the control group and the following 15 formed the experimental group.

This study has followed the ethical principles of the Declaration of Helsinki and has at all times respected participants' rights to protect their integrity. Precautions were taken to protect the intimacy and confidentiality of patient information. Participants volunteered of their own accord and the treatment of those not wishing to take part was uninfluenced by their decision.

## Results

The modified Yale scale showed that in the control group (where there was no psychological intervention on behalf of the nurses) there were 11 children with anxiety and 4 without. On the other hand in the experimental group (with nurse intervention) there were only 3 children with anxiety and 12 without (Figure 1).



With this scale in percentages we found that 73.3 % of the control group presented anxiety while 26.7 % did not. On the other hand, in the experimental group the percentages are inverted and only 20% presented anxiety while 80% did not. (Chi-squared,  $p = 0.003415$ ).

If we calculate the odds ratio of not carrying out the psychological intervention it equals 12, that is, the risk of experiencing preoperative anxiety increases by 12 fold in the control group.

By using a multiple linear regression model we can conclude that the only explicative variable of the model is the psychological intervention, adjusting results by the variables of age and gender (Table 1).

	Estimator	Error	t-value	Significance
	58.225	13.178	4.418	0.000156***

Sex [t. BOY]	13.546	7.7	1.759	0.090312
Age	-2.787	1.983	-1.405	0.171807
Intervention [t. YES ]	-15.616	7.695	-2.029	0.052764***

**Table 1:** Multiple linear regression model Preoperative anxiety measured by the Yale scale versus remaining variables.

## Discussion

Preoperative anxiety (anxiety regarding an imminent surgical experience) in children is a common phenomenon which is associated with negative behavior that occurs during surgery (agitation, crying, spontaneous urination and the need for physical restraint during anaesthetic induction).

Various factors may influence preoperative anxiety in the child: anticipation of pain, fear of separation from parents, loss of control, unfamiliar routines, hospital procedures, and surgical instruments [11].

According to other studies [12], we found that the presence of clowns was an effective intervention to improve the management of child's anxiety during the preoperative period. Based in our results, the use of hospital clowns has been proven to reduce psychological discomfort in children in a hospital setting.

## Conclusion

- The studied psychological intervention is associated with a reduction in levels of anxiety in children about to undergo a programmed surgery.
- The intervention shows similar efficacy in all ages and in both genders.

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