RESEARCH PAPER

Effect of Face-to-Face Education on Anxiety and Pain in Children with Minor Extremity Injuries Undergoing Outpatient Suturing in Emergency Department

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Received: September 22, 2016; Initial review: February 08, 2017; Accepted: August 31, 2017.

Objective: To assess the effect of face-to-face education on anxiety and pain in children with minor extremity injuries undergoing outpatient suturing. **Methods:** Children in intervention and control groups received face-to-face education (10 minutes) and no specific education, respectively. The anxiety and pain was measured using Modified-Yale Preoperative Anxiety Scale, and pain by Faces Pain Scale–Revised, respectively in 3 stages *viz*, pre-procedure and pre-intervention, post-procedure. **Results:** Children in the intervention group were less anxious than the control at pre-procedure and post-intervention stage (41.1 (13.8) *vs*. 46.3 (19.1), respectively, *P*=0.03) and post-procedure and post-intervention stage (32.3 (17.2) *vs.* 40.2 (12.9), respectively, *P*=0.01). Children in the intervention group experienced less pain than the control at pre-procedure and post-intervention stage (3.9 (3.8) *vs.* 4.9 (3.1), respectively, *P*<0.001) and post-procedure and post-intervention stage (3.1 (1.2) *vs.* 4.0 (2.1), respectively, *P*=0.001). **Conclusions:** Face-to-face education could reduce anxiety and pain in children undergoing suturing in the emergency department.

Keywords: *Intervention, Management, Perioperative, Stress.*

Trial Registration: Iranian Registry of Clinical Trials (IRCT2016020714930N4)

Published online: September 26, 2017. PII:S097475591600094

Most children undergoing outpatient procedures in emergency department (ED) may experience anxiety and pain, which is commonly managed unsatisfactorily [1,2]. The American Academy of Pediatrics suggests that health care professionals create favorable conditions for children to manage these two problems in the ED [3].

Face-to-face education has been shown to be effective for management of adults' anxiety and pain [4,5], but this education is not provided routinely to children, particularly in the ED [6]. Due to limited evidences on the efficacy of face-to-face education on anxiety and pain in children, we assessed the effect of this education on anxiety and pain in children undergoing suturing with local anesthesia in the ED.

Methods

Children were eligible for inclusion if they had one minor injury in upper or lower extremities, which occurred at least 1 hour and maximally 6 hours before admission, and had indication of suturing with local anesthesia. Inclusion criteria were age 6-12 years, lack of any sign of bone fractures, dislocation, amputation, presence of a foreign body, nerve damage, fever and infection, presence of children's parents (either mother or father), lack of using sedative or analgesic before the procedures, lack of developmental, physical or psychological problems, not having previous hospitalization, ED admission or outpatient procedures after 18 months of age, and lack of long-term illness and/or pain that requires special medical care.

This study was approved by Ethic Review Board of Dezful University of Medical Sciences (Khuzestan, Iran). Once a child met the study inclusion criteria, a written informed consent was obtained from the parents. Based on an earlier study [6], the sample size was calculated as 39 subjects considering type I error of 5%, type II error of 20%, and children's anxiety as a key variable. Expecting a 10% dropout rate, we planned 43 subjects in each group. A Random allocation software [7] was used by the

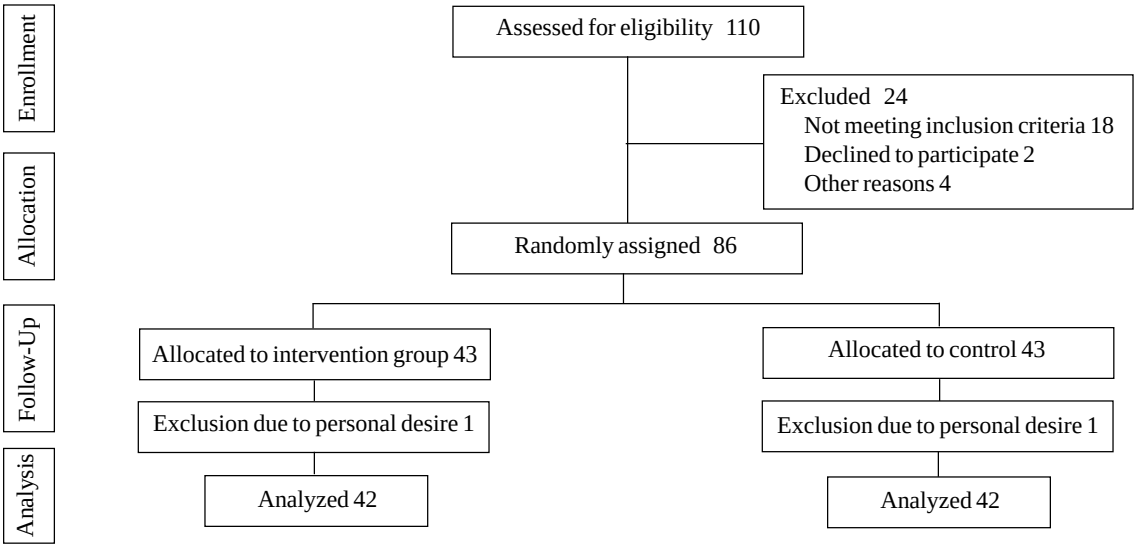

FIG. 1 *Study flow chart.*

first researcher assistant to allocate children, who was the only person with access to the randomization. Block randomization method was used to stratify children into blocks based on injury sites (lower and upper extremities) and age groups (6-9 and 9-12 years).

The primary outcome was anxiety, which was evaluated with Modified-Yale Preoperative Anxiety Scale (M-YPAS) scoring from 23-100, with higher scores showing greater anxiety [6]. As secondry outcome, we used Faces Pain Scale–Revised (FPS-R) to measure pain. FPS-R is on a metric scale of 0 to 10. Zero denoted no pain, and 10 denoted the most severe pain [8]. Scales were completed at three stages *viz.*, pre-procedure and pre-intervention (30 min before the procedure), pre-procedure and post-intervention (immediately after the end of the intervention and 15 min before the procedure), and post-procedure (15 and 30 min after the end of the procedure for M-YPAS and FPS-R, respectively).

Children in the control group received standard care by hospital staff, while the intervention group received standard care plus education. All educational interventions were provided in a consultation room by the same research assistant on a one-to-one basis for duration of 10 minutes, about 15 minutes before the procedure. Based on children's desire for perioperative information [9] and viewpoints of an independent group of expert pediatric nurses and two anesthesia consultants, the children were trained in a simple way about the ED environment, family support, feeling of anxiety and pain (including whether they would experience these, how long these would last, and how bad these would be), and procedural information (time, potential complications, anesthesia, and what to expect during and after the procedure). In all cases, suturing and local anesthesia (with Lidocaine 2% using an insulin syringe) were performed by the same staff with the same technique. During the procedure, parents in both groups were asked to be present next to their child. The decision as to which parent would accompany the child was left to them.

Statistical analysis: To examine group differences, independent sample t-test and chi-square test were used for quantitative and qualitative variables, respectively. Repeated measures ANOVA were applied to assess variables over time. Statistical analysis was done by SPSS software version 18 (SPSS, Inc. Chicago, IL, USA). *P* value <0.05 was considered as significant.

RESULTS

One hundred and ten children admitted to ED of Dezful Ganjavian Hospital, Khuzestan, Iran, from December 20, 2015 through February 14, 2016, were recruited (***Fig.*** **1**). Both groups were not significantly different pertaining to demographic and clinical characteristics (***Table*** **I**).

Except in the first stage, in others stages children in the intervention group experienced significantly lower anxiety and pain. Both variables significantly differed between the two groups and over time, and an interaction of time and group was observed (***Table*** **II).** Comparison of anxiety and pain during various stages is shown in ***WebFig.*** **1**.

TABLE I CHARACTERISTICS OF THE CHILDREN UNDERGOING OUTPATIENT SUTURING (*N*=84)

Variables	*Intervention (n=42)*	*Control (n=42)*
Age (6-9 years); *n* (%)	30 (71.3)	28 (66.7)
Gender (Male); *n* (%)	28 (66.7)	25 (59.5)
Kind of parent (both mother and father); *n* (%)	18 (42.9)	20 (47.6)
Site of injury and sutures, No. (%)		
Upper extremity [*] (right)	14 (33.4)	14 (33.4)
Lower extremity [#] (left)	16 (38.1)	17 (40.4)
[$]Size of injury ($cm^2$)	93.3 (4.2)	89.6 (3.3)
[$]Time spent in suturing (min)	8.1 (1.6)	7.5 (1.2)
Kind of sutures, No. (%)		
Simple interrupted	36 (85.7)	33 (78.6)
Simple vertical mattress (far and near)	6 (14.3)	9 (21.4)

[*]Including finger, wrist, lower arm, elbow, and upper arm; [#]Including toe, foot, ankle, lower leg, knee, upper leg, and lower trunk; P<0.05 for all comparison; [$]mean (SD).

TABLE II COMPARISON OF ANXIETY AND PAIN IN THE INTERVENTION GROUP (*N*=42) AND CONTROL GROUP (*N*=42)

Stages	*Intervention group*	*Control group*
Anxiety (M-YPAS), mean (SD)		
Pre-intervention (baseline)	45.4 (16.7)	47.6 (12.8)
Post-intervention	41.1 (13.8)	46.3 (19.1)
*Post-procedure	32.3 (17.2)	40.2 (12.9)
Pain (FPS-R), mean (SD)		
Pre-intervention (baseline)	4.9 (0.2)	5.1 (1.2)
[#]Post-intervention	3.9 (3.8)	4.9 (3.1)
[$]Post-procedure	3.1 (1.2)	4.0 (2.1)

M-YPAS: Modified Yale Preoperative Anxiety Scale; FPS-R: Faces Pain Scale–Revised; [*]P=0.001;[#]P<0.001; [$]P=0.011.

DISCUSSION

Children's anxiety and pain were significantly lower in the intervention group. We used a single-blind technique and only the investigator was blinded, as it was not possible to blind the children, parents, staffs and the educator nurse. However, to ensure that the intervention would have no effect on the control group, preparation was made separately for the groups and we asked nursing staffs to not provide information for children and their parents. In the present study, a homogenous sample of children aged 6-12 years was recruited. Therefore it is not clear whether children below this age range can also benefit from the intervention as younger children are more vulnerable to anxiety and pain [10,11]. Moreover, all the data were collected in one setting and only children undergoing outpatient suturing with local anesthesia were included. This might limit the ability to generalize the results.

Previous studies have either evaluated other educational interventions, or have been conducted in the operating room during general anesthesia [12,13]. Among children undergoing outpatient surgical procedures under general anesthesia, it was shown that preoperative education (simple explanations with a focus on separation anxiety, reassurance, the use of dolls and positive behavior reinforcement) reduced overall anxiety but group differences were not significant, while education significantly reduced children's postoperative pain [12]. In another trial, it was demonstrated that perioperative information and dialogue with children undergoing outpatient surgical procedures requiring general anesthesia was associated with significantly lower anxiety on the day of surgery and postoperatively compared to control but no significant differences were observed in pain scores [13]. The discrepancy may be due to differences in the age of children, educational interventions, procedures, anesthesia, and setting.

Based on our results, face-to-face education may be effective for anxiety- and pain-reduction in children undergoing outpatient suturing with local anesthesia. Further trials are recommended in different settings, clinical procedures, and age-range to extend this research.

Acknowledgments: Research Deputy vice-chancellor for research affairs of Dezful University of Medical Sciences, Iran, for technical support as well as valuable assistance.
Contributors: All authors contributed equally to the concept, design, data collection, acquisition of data, analysis and interpretation of data and drafting the manuscript. All authors read and approved the study.
Funding: Dezful University of Medical Sciences, Iran (grant number: DUMS.REC.1394.16).
Competing interests: None stated.

WHAT THIS STUDY ADDS?

- Face-to-face education is effective for pain-relief and anxiety-reduction in children undergoing outpatient suturing in the emergency department.

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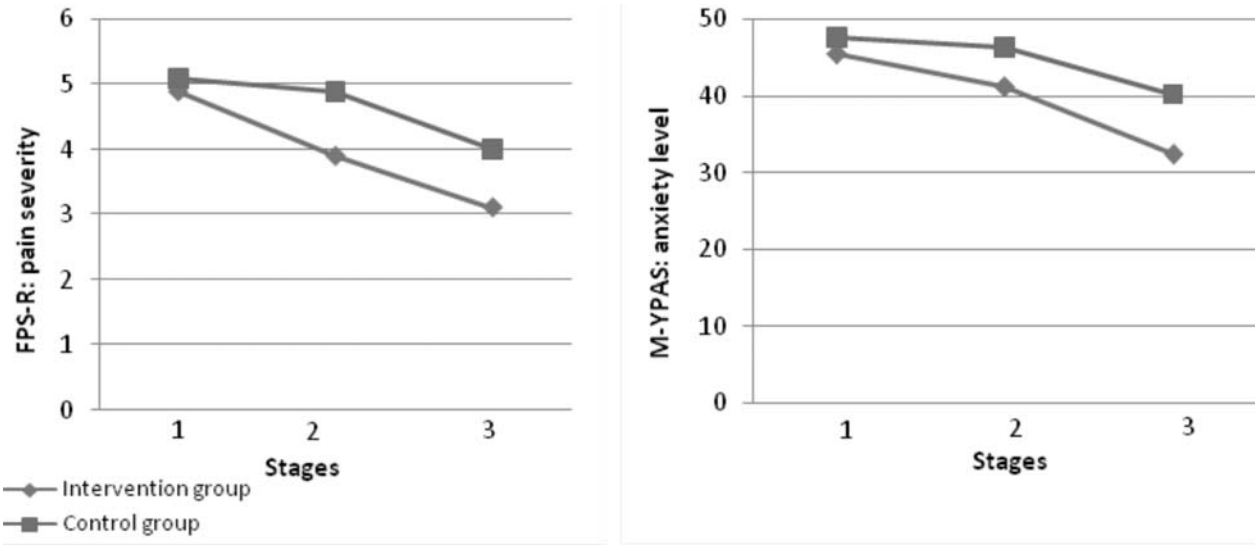
Erratum

In the article entitled "Prevalence of Nonalcoholic Fatty Liver Disease in Normal-weight and Overweight Preadolescent Children in Haryana, India" published in December 2017 issue of Indian Pediatrics on page no. 1012-1016, authors' name should be read as follows:

MANOJA KUMAR DAS, [#]VIDYUT BHATIA, [#]ANUPAM SIBAL, [*]ABHA GUPTA, [#]SARATH GOPALAN, [‡]RAMAN SARDANA, [$]REETI SAHNI, [#]ANKUR ROY AND NARENDRA K ARORA



WEB FIG. 1 *Comparison of anxiety and pain during three stages in control and intervention groups.*
FPS-R: Faces Pain Scale–Revised, M-YPAS: Modified Yale Preoperative Anxiety Scale, Data were collected at three stages: (1) pre-procedure and pre-intervention, (2) pre-procedure and post-intervention, (3) post-procedure.