

The effect of virtual reality glasses against the fear of circumcision: A randomized controlled trial

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AIM: Circumcision is an invasive operation that male children undergo in our country and some others. During this process, the child can experience fear, anxiety, and pain simultaneously. As a randomized controlled VR study, this research was conducted to determine the effect of virtual reality (VR) glasses on reducing fear/anxiety and pain during circumcision in children.

METHODS: The study was conducted on 125 children (6-11 years old). The same healthcare team performed the circumcision of the children in both groups. The children were randomly split into VR and control groups. The children in the VR group, just before the circumcision, watched their preferred cartoon film via VR glasses. No additional procedure was applied to the children in the control group except for ordinary procedures in the hospital. The fear and pain status measured by Wong-Baker Faces Pain Rating Scale and Children Fair Scale of all the children were evaluated before and after the operation by the child, parents, and the observer. Descriptive statistics, chi-square, and t-tests analyzed the data.

RESULTS: There was no significant difference between the groups regarding demographic characteristics such as age, BMI, previous hospitalization, and anesthetic drug used before the procedure of the children included in the study. Preoperative (VR = 1.03 (0.18), control = 1.05 (0.22)) and pre-procedural (VR = 2.61 (1.02), control = 2.33 (1.22)) fear levels were also similar ($P > 0.05$). After the procedure, it was determined that the mean duration of the procedure (365.36 (64.73) sec), crying time (21.31 (41.74) sec), and fear scores (0.36 (0.68)) of the children in the VR group were lower ($P < 0.001$). However, pain mean scores were similar ($P > 0.05$).

Table 1: Distribution of children by demographic characteristics (n = 125)

	VR group (n = 64)		Control group (n = 61)		t	P-value
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
Child's age (year)	7.03 (1.41)	7.08 (1.43)	7.03 (1.41)	7.08 (1.43)	0.199	0.842
BMI	18.76 (1.99)	18.32 (1.85)	18.76 (1.99)	18.32 (1.85)	-1.236	0.219
The preoperative child's fear levels	1.03 (0.18)	1.05 (0.22)	1.03 (0.18)	1.05 (0.22)	0.508	0.614
The pre-circumcision child's fear levels						
According to the child	2.61 (1.02)	2.33 (1.22)	2.61 (1.02)	2.33 (1.22)	-1.03	0.163
According to the parent	3.34 (0.72)	3.30 (0.86)	3.34 (0.72)	3.30 (0.86)	-0.343	-0.732
According to the first observer	3.47 (0.59)	3.34 (0.77)	3.47 (0.59)	3.34 (0.77)	-1.016	0.312
According to the second observer	3.45 (0.73)	3.41 (0.78)	3.45 (0.73)	3.41 (0.78)	-0.319	0.750

Table 2: Distribution according to children's hospital experience and analgesic agent applied in circumcision (n = 125)

	VR group (n = 64)		Control group (n = 61)		χ^2	P-value
	n	%	n	%		
	Have you been hospitalized before?					
Yes	7	10.9	9	14.8	0.408	0.523
No	57	89.1	52	85.2		
Name and dose of analgesic applied in the circumcision						
Marcaine* 3 cc, Citanest** 3 cc	29	45.3	27	44.3	0.018	0.991
Marcaine 3 cc, Citanest 4 cc	27	42.2	26	42.6		
Marcaine 4 cc, Citanest 4 cc	8	12.5	8	13.1		

* Marcain: The active ingredient is bupivacaine hydrochloride. ** Citanest: The active ingredient is Prilocaine hydrochloride.

Table 3: Distribution according to groups in terms of the duration of circumcision operation and crying of the child (n = 125)

	VR group (n = 64)		Control group (n = 61)		t	P-value
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
Duration of application (sec) (Min-Max)	365.36 (64.73) (254-522)	538.66 (179.79) (280-1200)	365.36 (64.73)	538.66 (179.79)	7.236	<0.001
Child's crying time (sec) (Min-Max)	21.31 (41.74) (0-190)	322.21 (188.86) (20-860)	21.31 (41.74)	322.21 (188.86)	12.434	<0.001
Child's fear after circumcision (according to the child)	0.36 (0.68)	3.51 (0.67)	0.36 (0.68)	3.51 (0.67)	26.085	<0.001
Child's fear after circumcision (according to the parent)	0.39 (0.70)	3.48 (0.72)	0.39 (0.70)	3.48 (0.72)	24.195	<0.001
Child's fear after circumcision (according to the observer)	0.38 (0.70)	3.54 (0.79)	0.38 (0.70)	3.54 (0.79)	23.770	<0.001
Pain levels after circumcision (according to the child)	0.28 (1.00)	0.56 (2.04)	0.28 (1.00)	0.56 (2.04)	0.969	0.334
Pain levels after circumcision (according to the parent)	0.22 (0.72)	0.46 (1.80)	0.22 (0.72)	0.46 (1.80)	0.986	0.326
Pain levels after circumcision (according to the observer)	0.28 (0.93)	0.46 (1.73)	0.28 (0.93)	0.46 (1.73)	0.720	0.473

CONCLUSION: It can be stated that using distraction through VR cartoon films highly reduces the fear emerging in children during circumcision. Furthermore, it significantly decreases the duration of the operation, thus, rendering this operation no more a traumatic event for the child. It was also determined that this method did not influence the pain felt during this operation. The children display more comfortable behaviors after the operation can be attributed to the fact that circumcision is a fear-focused process rather than a pain. Accordingly, the VR method is a non-initiative, non-traumatic, and non-pharmacologic, effective method that reduces the fear and decreases the duration of the process. Therefore, it is suggested that the VR method is used during the circumcision process, particularly for children between 6-11 years old.

CLINICAL IMPLICATIONS: In circumcision, a method should be used to reduce and prevent anxiety, fear, and pain in the child. For example, having children watch cartoon movies during the circumcision operations is highly effective in reducing the fear, shortening the duration of the crying children, and conducting the procedure faster. Therefore, during circumcision, distraction through VR glasses can be applied to children between 6-11 years old. During interventional procedures in children, VR glasses are an easy-to-use, economical, safe, and practical method that will reduce or prevent fear/anxiety and pain and reduce application time.