The effects of virtual reality glasses and external cold and vibration on procedural pain and anxiety in children during venous phlebotomy: randomized controlled trial

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AIM: Needle-related procedures are among the most feared and painful experiences reported by children and their parent. For this reason, use of effective methods of pain relief is very important during phlebotomy procedures in children. The aim of this study is to research two different distraction methods (external cold and vibration-Buzzy + virtual reality) on relief of procedural pain and anxiety in children during phlebotomy.

METHODS: This study is a prospective, randomized and controlled trial. Sample of the study consisted of a total of 119 children who met the sample selection criteria. Children aged 7 to 12 years who required phlebotomy were divided into three groups: buzzy (n = 40), virtual reality (n = 40), and control (n = 39). Data were collected using the information form, Wong–Baker FACES Pain Rating Scale, and Children's Fear Scale. In the study, 119 children [girls n = 59 (49.6%), boys n = 60 (50.4%)] were included. The children's pain levels were assessed and reported by the parents and observers and the children themselves who self-reported using Wong–Baker FACES. The children's anxiety levels were also assessed using the Children's Fear Scale.

RESULTS: significant difference was found between the groups in terms of the parent-reported and observer-reported assessments ($p < 0.05$). In the self-reported assessment, the pain levels of the VR and Buzzy group were lower than the control group, but were not statistically significant ($p > 0.05$). According to the parent-reported and observer-reported assessments, a significant difference was found between procedural anxiety levels.

CONCLUSION: VR is more effective than external cold and vibration-Buzzy in reducing pain during phlebotomy and should be preferred as the first choice.

Table 1 Baseline characteristics and pre-procedural anxiety scores of the study groups

	Buzzy group-1 ($n=40$)	VR group-2 ($n=40$)	Control group-3 ($n=39$)	χ^2	P
Sex					
Female	20 (50)	20 (50)	19 (49)	.050	.975
Male	20 (50)	20 (50)	20 (51)		
	Buzzy Group-1 ($n=40$)	VR Group-2 ($n=40$)	Control Group-3 ($n=39$)	F	P
Age	9.21 ± 1.90	9.87 ± 1.95	10.17 ± 2.56	2.085	.129
BMI	18.12 ± 4.57	18.98 ± 4.58	19.15 ± 4.87	.843	.433
Pre-procedural anxiety levels					
Self-reported	2.17 ± 1.39	2.00 ± 1.39	2.07 ± 1.26	0.175	.840
Parent-reported	2.09 ± 1.20	1.82 ± 1.27	2.10 ± 1.25	0.652	.523
Observer-reported	2.00 ± 1.18	1.85 ± 1.29	2.10 ± 1.25	0.409	.665

Data are represented as number (percentage) or mean ± standard deviation, where appropriate

BMI: Body Mass Index

Table 2 Comparison of procedural pain scores of the study groups

Procedural Pain Scores According to WB-FACES	Buzzy Group-1 ($n=40$)	VR Group-2 ($n=40$)	Control Group-3 ($n=39$)	F	p	Group 1–2	Group 1–3	Group 2–3
Self-reported	2.82 ± 2.93	2.10 ± 2.47	3.58 ± 2.60	3.049	0.051	0.242	0.083	**0.005**
Parent-reported	2.92 ± 2.96	1.70 ± 2.15	3.58 ± 2.47	5.559	**0.005***	**0.033**	0.087	**0.000**
Observer-reported	2.82 ± 2.89	1.65 ± 2.11	3.58 ± 2.47	5.944	**0.003***	**0.038**	0.069	**0.000**

Bold values indicate statistical significance ($p < 0.05$)

Data are represented as mean ± standard deviation. WB-FACES, Wong–Baker Faces

*In the Bonferroni advanced analysis, it was determined that the control group was the group making the difference

Table 3 Comparison of procedural anxiety scores of the study groups

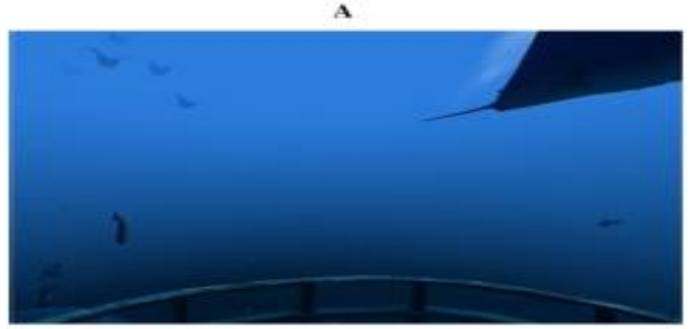
Procedural Anxiety Scores	Buzzy Group-1 ($n=40$)	VR Group-2 ($n=40$)	Control Group-3 ($n=39$)	F	p	Group 1–2	Group 1–3	Group 2–3
Parent-reported	0.95 ± 0.94	0.75 ± 1.03	1.51 ± 1.16	5.581	**0.005***	0.208	**0.029**	**0.002**
Observer-reported	0.95 ± 0.94	0.67 ± 0.99	1.51 ± 1.16	6.650	**0.002***	0.100	**0.029**	**0.001**

Bold values indicate statistical significance ($p < 0.05$)

Data are represented as mean ± standard deviation

*In the Bonferroni advanced analysis, it was determined that the control group was the group making the difference

A



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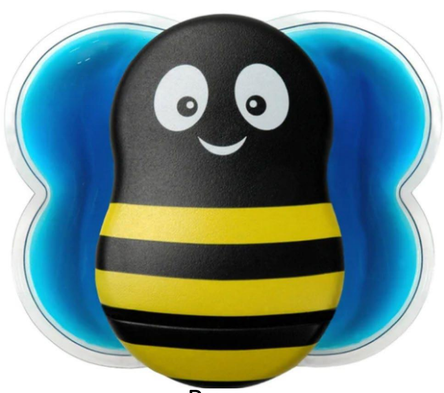

Buzzy

Virtual reality

Yilmaz, D., & Canbulat Sahiner, N. (2023). The effects of virtual reality glasses and external cold and vibration on procedural pain and anxiety in children during venous phlebotomy: randomized controlled trial. *Virtual Reality*, *27*(4), 3393-3401.