Supplemental Online Content

Xiang H, Shen J, Wheeler KK, et al. Efficacy of smartphone active and passive virtual reality distraction vs standard care on burn pain among pediatric patients: a randomized clinical trial. *JAMA Netw Open*. 2021;4(6):e2112082. doi:10.1001/jamanetworkopen.2021.12082

This supplemental material has been provided by the authors to give readers additional information about their work.
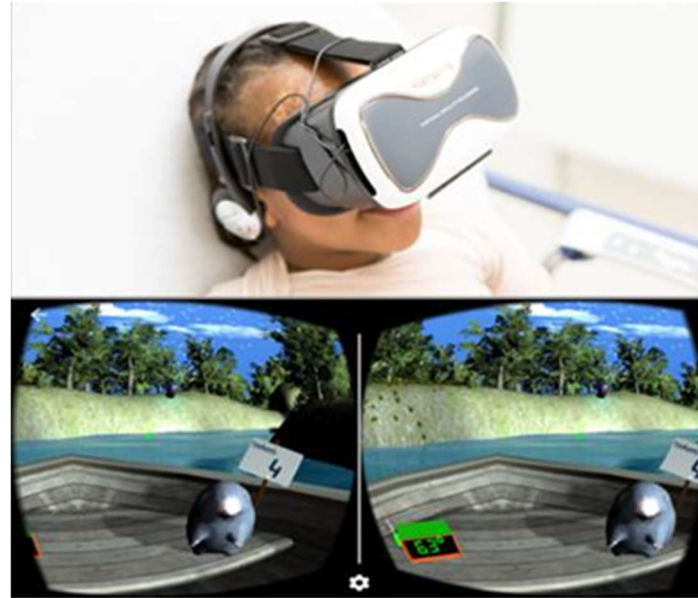
eFigure. Smartphone VR-PAT

eTable 1. Subgroup Analysis: Mean Pain Score by Distraction Type and Race

	Distraction Type						P-value[1]
	Active VR (N=31)		Passive VR (N=30)		Control (N=29)		
	Median	(Q1, Q3)	Median	(Q1, Q3)	Median	(Q1, Q3)	
Observed Pain							
White	10.0	(0.0,20.0)	0.0	(0.0,20.0)	30.0	(0.0,40.0)	0.3
Non-White	5.0	(0.0,30.0)	0.0	(0.0,50.0)	15.0	(10.0,40.0)	0.9
Self-reported Overall Pain							
White	5.0	(0.0,49.0)	8.0	(0.0,70.0)	33.0	(1.0,70.0)	0.4
Non-White	9.0	(0.0,63.0)	10.0	(0.0,60.0)	59.5	(10.0,100)	0.3
Self-reported Worst Pain							
White	11.0	(0.0,53.0)	50.0	(0.0,96.0)	34.0	(1.0,80.0)	0.3
Non-White	13.5	(0.0,48.5)	50.0	(0.0,88.0)	70.0	(0.0,100)	0.2

Note: [1] P-value from ANOVA when comparing the means across the three distraction groups

Q1=first quartile (25th percentile), Q3=third quartile (75th percentile)

eTable 2. Univariate Linear Regression Analysis of Demographic and Burn Characteristics, Pain Medication Prior to Burn Dressing, Child Expectation of VR, and VR Group on Pain Scores, All Children

Variable	Observed Pain Score			Self-reported Overall Pain Score			Self-reported Worst Pain Score		
	Parameter estimate	95% CI	P-value	Parameter estimate	95% CI	P-value	Parameter estimate	95% CI	P-value
Age	-2.49	(-4.12,-0.85)	<0.01	-2.81	(-5.20,-0.43)	0.02	-2.51	(-5.02,-0.01)	0.05
Gender	4.00	(-7.41,15.41)	0.49	4.60	(-11.73,20.93)	0.58	4.44	(-12.57,21.46)	0.61
Race(White vs.Non-White)	-2.84	(14.3,8.69)	0.62	-10.93	(-27.3,5.41)	0.19	-8.63	(-25.72,8.47)	0.32
STAQI_CH_score	1.72	(-0.09,3.52)	0.06	3.00	(0.45,5.56)	0.02	2.26	(-0.44,4.96)	0.10
TBSA (%)	3.02	(1.67,4.36)	<0.01	1.78	(-0.38,3.94)	0.10	1.99	(-0.27,4.26)	0.08
Burn_degree	30.93	(10.95,50.91)	<0.01	21.56	(-7.97,51.01)	0.15	25.49	(-5.1,56.07)	0.10
Used pain medication within 6 hours of burn dressing	16.25	(4.41,28.07)	<0.01	20.56	(3.65,37.47)	0.02	20.67	(2.95,38.38)	0.02
Active VR vs. Control	-9.04	(-23.01,4.92)	0.20	-22.20	(-41.80,-2.60)	0.03	-21.34	(-41.69,-0.98)	0.04
Passive VR vs. Control	-4.84	(-18.91,9.23)	0.50	-11.34	(-31.09,8.42)	0.26	-0.89	(-21.41,19.63)	0.93
Child expectation of VR fun for dressing	0.45	(0.17,0.72)	<0.01	0.44	(0.03,0.85)	0.04	0.20	(-0.24,0.64)	0.36
Child expectation of helpfulness of VR	-0.11	(-0.31,0.08)	0.26	-0.13	(-0.41,0.16)	0.38	-0.13	(-0.42,0.17)	0.39

STAQI-CH = State-Trait Anxiety Inventory for Children, TBSA (%)=Total body surface area of burn, 95% CI=95% confidence interval

eTable 3. Multivariate Linear Regression Analysis of Demographic and Burn Characteristics, Child Expectation of VR, and VR Group on Pain Scores Among Children Who Did Not Use Pain Medication Within 6 Hours of Burn Dressing

Variable	Observed Pain Score			Self-reported Overall Pain Score			Self-reported Worst Pain Score		
	Parameter estimate	95% CI	P-value	Parameter estimate	95% CI	P-value	Parameter estimate	95% CI	P-value
Age	-0.00	(-1.68,1.68)	0.99	0.13	(-2.92,3.18)	0.93	-0.81	(-4.26,2.64)	0.64
Gender	1.49	(-9.03,12.02)	0.78	7.42	(-11.63,26.46)	0.44	6.88	(-14.67,28.43)	0.52
Race(White vs.Non-White)	-6.70	(-17.24,3.84)	0.21	-22.05	(-41.12,-2.97)	0.02	-17.07	(-38.65,4.52)	0.12
STAQI_CH_score	-0.20	(-1.81,1.42)	0.81	1.06	(-1.87,3.99)	0.47	0.14	(-3.17,3.46)	0.93
TBSA (%)	2.98	(1.26,4.69)	<0.01	2.25	(-0.86,5.36)	0.15	1.93	(-1.59,5.45)	0.28
Burn_degree	-0.25	(-29.36,28.86)	0.98	8.31	(-44.37,60.98)	0.75	7.30	(-52.32,66.90)	0.81
Active VR vs. Control	-7.32	(-20.43,5.79)	0.27	-26.39	(-50.12,-2.67)	0.03	-17.23	(-44.08,9.61)	0.20
Passive VR vs. Control	-6.03	(-18.74,6.69)	0.35	-24.09	(-47.11,-1.09)	0.04	-6.80	(-32.84,19.24)	0.60
Child expectation of VR fun for dressing	0.33	(0.03,0.63)	0.03	0.50	(-0.03,1.05)	0.07	0.24	(-0.37,0.87)	0.43
Child expectation of helpfulness of VR	-0.13	(-0.33,0.06)	0.17	-0.31	(-0.66,0.05)	0.09	-0.31	(-0.71,0.09)	0.13

STAQI-CH = State-Trait Anxiety Inventory for Children, TBSA (%)=Total body surface area of burn, 95% CI=95% confidence interval

eTable 4. Multivariate Linear Regression Analysis of Demographic and Burn Characteristics, Child Expectation of VR, and VR Group on Pain Scores Among Children Who Did Use Pain Medication Within 6 Hours of Burn Dressing

Variable	Observed Pain Score			Self-reported Overall Pain Score			Self-reported Worst Pain Score		
	Parameter estimate	95% CI	P-value	Parameter estimate	95% CI	P-value	Parameter estimate	95% CI	P-value
Age	-2.72	(-6.22,0.78)	0.12	-5.45	(-10.23,-0.66)	0.03	-4.67	(-10.21,0.86)	0.09
Gender	-11.90	(-34.54,10.74)	0.29	10.92	(-20.03,41.89)	0.47	10.11	(-25.71,45.92)	0.56
Race(White vs.Non-White)	-1.14	(-33.74,31.46)	0.94	6.48	(-38.09,51.06)	0.76	26.72	(-24.85,78.29)	0.29
STAQI_CH_score	2.40	(-2.34,7.14)	0.30	5.46	(-1.01,11.94)	0.09	6.85	(-0.64,14.34)	0.07
TBSA (%)	3.25	(-1.29,7.80)	0.15	-2.43	(-8.65,3.78)	0.43	-0.55	(-7.75,6.63)	0.87
Burn_degree	-14.85	(-60.95,31.24)	0.51	-18.69	(-81.73,44.35)	0.54	-27.28	(-100.21,45.64)	0.44
Active VR vs. Control	22.24	(-6.36,50.85)	0.12	-14.83	(-53.95,24.29)	0.43	-37.85	(-83.10,7.40)	0.09
Passive VR vs. Control	14.93	(-11.47,41.33)	0.25	22.11	(-13.98,58.21)	0.22	21.30	(-20.45,63.06)	0.30
Child expectation of VR need for dressing	0.79	(0.12,1.45)	0.02	-0.36	(-1.27.0.54)	0.41	-0.67	(-1.72,0.38)	0.20
Child expectation of helpfulness of VR	-0.25	(-0.71,0.21)	0.26	0.18	(-0.44,0.80)	0.55	0.45	(-0.26,1.18)	0.20

STAQI-CH = State-Trait Anxiety Inventory for Children, TBSA (%)=Total body surface area of burn, 95% CI=95% confidence interval

eTable 5. Pediatric Patients With Burns Reported VR Experiences

	Distraction type	
	Active VR (N=31)	**Passive VR (N=30)**
	Mean (95% CI)	**Mean (95% CI)**
Fun (0-100, the higher the better)	85.7 (76.6,94.7)	77.3 (65.6,89.0)
Engaging (0-100, the higher the better)	78.9 (68.5,89.3)	72.7 (59.9,85.5)
Realistic (0-100, the higher the better)	73.1 (62.3,83.8)	59.1 (44.7,73.5)

95% CI=95% confidence interval

eTable 6. Secondary Outcomes of VR Game Experience of Pediatric Patients With Burns

	Distraction type		
	Active VR (N=31)	Passive VR (N=30)	Control (N=29)
Child reported game satisfaction [1]			
Happy with the VR game	30(97%)	27(90%)	-
Would use it again in future dressing changes	29(94%)	27(90%)	-
Caregiver reported game satisfaction [1]			
Happy with the VR game	31(100%)	29(97%)	-
Would use it again in future dressing changes	30(97%)	29(97%)	-
	Mean (95% CI)	Mean (95%CI)	Mean (95% CI)
Child report – Time spent thinking about pain (0 to 100) [2,3]	20.3 (8.9,31.8)	34.6 (20.2,49.0)	36.5 (20.8,52.2)
Clinician reported utility [1]			
Helpfulness (0-100, higher better)	84.2 (74.5,93.8)	76.9 (65.2,88.7)	-
Easiness (0-100, higher better)	94.8 (91.8,97.8)	96.0 (92.9,99.1)	-
Length of dressing change (minutes) [3]	5.2 (4.0,6.4)	4.5 (3.2,5.7)	3.3 (1.9,4.7)
Simulation sickness (0-60, lower better)	19.3(17.5,21.1)	19.5(17.6,21.5)	

[1] These questions were not asked for children in the control group

[2] Scale = 0-not at all to 100-very much

[3] Differences in the means by three groups were not statistically significant

95% CI=95% confidence interval