Bibliography as of 6/1/2019

Adult and All-Age Studies Italicized; Pediatric Studies

Reviews and Meta-Analyses

Ballard A Khadra C, Adler S, Doyon-Trottier E, Le May S. Efficacy of the Buzzy Device for Pain Management during Needle-Related Procedures: A Systematic Review and Meta-analysis. Clin J Pain. 2019 Feb 28 (N= 1138, pain reduction -1.11; 95% confidence interval [CI]: -1.52 to -0.70; P<0.0001) , anxiety reduction (SMD -1.37; 95% CI: -1.77 to -0.96; P<0.00001)


Lee VY, Caillaud C, Fong J, Edwards KM. Improving vaccine-related pain, distress or fear in healthy children and adolescents-a systematic search of patient-focused interventions. Hum Vaccin Immunother. 2018;14(11):2737-2747 “CONCLUSION: Interventions using coolant and vibration together, as well as a combination of site-specific and patient-led interventions, showed the most consistent effects in reducing self-reported pain, fear or distress.

Ueki S, Yamagami Y, Makimoto K. Effectiveness of vibratory stimulation on needle-related procedural pain in children: a systematic review. JBI Database System Rev Implement Rep. 2019 Apr 23 in press. Included Buzzy, Dental Vibe, Blaine Labs. “The effect size for the BUZZY tended to be higher than that for the other devices.” “Overall, vibratory stimulation was significantly effective: self-rated pain: -0.55, 95% confidence interval [95% CI]: -0.92 to -0.18) observer-rated pain outcomes (SMD: -0.47, 95% CI: -0.76 to -0.18). [With Buzzy] the effect on the child’s anxiety (SMD: -1.03, 95% CI: -1.85 to -0.20) was significant.”
Venipuncture

Abidin, N., Yahya, N., Izaham, A., Mat, W., Zain, J., Zainuddin, M., Mahdi, S. Assessing the Effectiveness of a Thermomechanical Device (Buzzy®) in Reducing Venous Cannulation Pain in Adult Patients [PDF] Middle East Journal of Anesthesiology 2018 Feb 25(1):61-67. (N=184, Lowest w/ Buzzy Pain score 33.92 ± 15.59 (p = 0.016) 81.0% of patients satisfied w/ Buzzy)


Baxter AL, Leong T, Mathew B. External thermomechanical stimulation versus vapocoolant for adult venipuncture pain: pilot data on a novel device. Clin J Pain. 2009 Oct;25(8):705-10. [Buzzy > cold spray, adult][N=31, Reduced Pain (mean 9.9 mm, 95% confidence interval 0.82-19, P=0.035, SD 16) compared to vapocoolant (mean 7.9 mm, 95% confidence interval -1.8-17.7, P=0.1, SD 16.9)]

Baxter AL, Cohen LL, McElvery HL, Lawson ML, von Baeyer CL. An integration of vibration and cold relieves venipuncture pain in a pediatric emergency department. Pediatr Emerg Care. 2011 Dec;27(12):1151-6. (N=81, Pain scores lower with Buzzy(-2; 95% CI, -4 to 0) than with vapocoolant (1; 95% CI, 0-2)Venipuncture success more likely w/ Buzzy (odds ratio, 3.05; 95% CI, 1.03-9.02), pediatric]


Binay Ş, Bilsin E, Gerçeker GÖ, Kahraman A, Bal-Yılmaz H. Comparison of the Effectiveness of Two Different Methods of Decreasing Pain During Phlebotomy in Children: A Randomized Controlled Trial. J Perianesth Nurs. 2019 Feb 20 S1089-9472(18)30414-3 (block randomization, 3-6 y/o, Pain scores were lower in the groups of external cold and vibration, and blowing soap bubbles than the control group.)

Canbulat N, Ayhan F, Inal S. Effectiveness of external cold and vibration for procedural pain relief during peripheral intravenous cannulation in pediatric patients. Pain Manag Nurs. 2015 Feb;16(1):33-9. (N=176, 7-12 y/o, significantly lower anxiety and pain in group using Buzzy.)

Cozzi G, Crevatin F, Dri V, Bertossa G, Rizzitelli P, Matassi D, Minute M, Ronfani L, Barbi E. Distraction Using Buzzy or Handheld Computers During Venipuncture. Pediatr Emerg Care. 2018 Dec 27 (N=200, Mean age=8, Buzzy = to handheld computer distraction, both statistically significantly less pain than control.)

García-Aracil N, Ramos-Pichardo JD, Castejón-de la Encina ME, José-Alcaide L, Julió-Sanchis R, Sanjuan-Quiles Á. Effectiveness of non-pharmacological measures for reducing pain and fear in children during venipuncture in the emergency department: a vibrating cold devices versus distraction.
Emergencias. 2018 Jun;30(3):182-185 (3 study groups, Reduced pain and fear in adults, Reduced pain in children)

Gerçeker GÖ, Binay Ş, Bilsin E, Kahraman A, Yılmaz HB. Effects of Virtual Reality and External Cold and Vibration on Pain in 7- to 12-year-old Children During Phlebotomy: A Randomized Controlled trial. J Perianesth Nurs. 2018 Mar 17. (N=121, Buzzy = VR, both statistically significantly less pain than control.)

Inal S., Kelleci M. The Effect of External Thermomechanical Stimulation and Distraction on Reducing Pain Experienced by Children During Blood Drawing. Pediatr Emerg Care. 2017 Sep 5. In press (N=218, All groups using Buzzy had significantly reduced pain (P < 0.001), Lowest pain measured w/ Buzzy in combination w/ DistrAction Cards)

Inal S, Kelleci M. Relief of pain during blood specimen collection in pediatric patients. MCN Am J Matern Child Nurs. 2012 Sep;37(5):339-45. [Buzzy v. control, pediatric] (N=120, 6-12y/o, Lower pain (p < .001) and anxiety (p < .001) w/ Buzzy)


Küçük Alemdar D1, Yaman Aktaş Y2. The use of the Buzzy, Jet lidocaine, bubble-blowing and aromatherapy for reducing pediatric pain, stress and fear associated with phlebotomy. J Pediatr Nurs. 2019 Jan 30 S0882-5963(18)30352-X (N=195, 5-10 y/o, Significant difference in intervention and control groups, Buzzy made the most impact on fear and pain (p < 0.05))


Potts, D., Davis KF, Fein J. A Vibrating Cold Device to Reduce Pain in the Pediatric Emergency Department: A Randomized Clinical Trial. Pediatr Emerg Care. 2017 Jan 24 doi: 10.1097/PEC.0000000000001041. (N=224, 4-18y/o, Buzzy equivalent to LMX for pain, satisfaction patients, satisfaction nurses. Time for IV procedure completion significantly shorter in group using Buzzy.)


Schreiber S, Cozzi G, Rutigliano R, Assandro P, Tubaro M, Cortellazzo Wiel L, Ronfani L, Barbi E. Analgesia by cooling vibration during venipuncture in children with cognitive difficulties. Acta Paediatr. 2016 Jan;105(1):e12-6. [N=70, pediatric, severe cognitive impairment, “reported no or mild procedural pain in 32 cases (91.4%) in the Buzzy group and in 22 cases (61.1%) in the no-intervention group (p = 0.003).”]

Tork HM Comparison of the Effectiveness of Buzzy, Distracting Cards and Balloon Inflating on Mitigating Pain and Anxiety During Venipuncture in a Pediatric Emergency Department. Am J Nursing Science 2017 Feb;6(2):26-32 (N=180, Pediatric, Lowest pain scores with Buzzy (1.90±1.34) vs Distracting cards (3.17 ±2.13) vs Balloon inflating (2.83 ±1.41) vs control (4.15±1.29), (p=0.012), Buzzy and distraction card groups had the greatest reduction in anxiety.)


*In Progress/Recruiting: Clark J. DHHS Buzzy for IV access pain relief in adults with cognitive difficulties.


*In Progress/Completed: Stein K. Buzzy Use for IV access in Dentistry. University of Iowa College of Dentistry. NCT03619135

**Injections**


Canbulat Sahiner N, Turkmen AS, Acikgoz et al. Effectiveness of Two Different Methods for Pain Reduction During Insulin Injection in Children with Type 1 Diabetes: Buzzy and Shotblocker. Worldviews Evid Based Nurs 2018 Oct 11. Epub ahead of print. (N=60, Buzzy and Shotblocker both reduced pain compared to control.)

Redfern RE, Chen JT2, Sibrel S3. Effects of Thermomechanical Stimulation during Vaccination on Anxiety, Pain, and Satisfaction in Pediatric Patients: A Randomized Controlled Trial. J Pediatr Nurs. 2018 Jan-Feb;38:1-7 [N=50, pain significantly less (3.56 vs 5.92, p=0.015), pediatric]

Redfern RE, Micham J, Seegert S, Chen JT. Influencing Vaccinations: A Buzzy Approach to Ease the Discomfort of a Needle Stick – a Prospective, Randomized Controlled Trial. Pain Management Nursing, 2018 Nov 10 p1-9. (N=497 pain 0.87 v 1.12 p=.035, better than previous experiences 62% Buzzy 23.9% control p<.0001.)

Rundell JD, Sebag JA, Kihm CA, Herpen RW, Vlahovic TC. Use of an external vibratory device as a pain management adjunct for injections to the foot and ankle. The Foot and Ankle Online Journal 2016 9 (4): 6 (N=108, 31.3% decrease in pain associated w/ injections in treatment vs control group)

Sahin M. Effect of Buzzy® application on pain and injection satisfaction in adult patients receiving intramuscular injections. Pain Management Nurs 2018 Dec:19(6):645. Diclofenac, (N=65, average age 52, Pain 74% reduced, satisfaction 95 v. 84. P<.001 both)


In Progress: Katia L, Joret I. Nantes University Hospital, France. Efficacy of the Buzzy® Device on the Prevention of Health Care Induced Pediatric Pain in a Vaccination Center (DOLVAX) NCT03220555

*In Progress: Mesterman R. Pain Perception of Children and Youth Receiving Non-sedated Botulinum Toxin-A Injections Using the Buzzy®. NCT02273284


*In Progress: Feasibility, Acceptability and Satisfaction of a New Device (Buzzy®) for Pediatric Procedural Pain and Anxiety Management During SQ, IV, and IM Needle-Related Procedures: A Pilot Study. NCT02771600

*In Progress: Steiner SJ, Riley Children’s Hospital. Buzzy for patients with IBD – improvement of treatment with Humira or Remicade. Presentation at ImproveCareNow.


*In Progress: Marcio Boniatti, Hospital Nossa Senhora da Conceicao Rio Grande Do Sul, Brazil, Minimizing pain during childhood vaccination. Infants, outcome crying in seconds NCT03540589

Lab Values and pharmacokinetic considerations


Baxter AL, Lawson ML. Concerns with the methodology, analysis and discussion of the Buzzy® and transillumination comparison article Blood Transfus. 2014 Jan; 12(Suppl 1): s3–s5


Itching

Musculoskeletal

Dental


DistrACTION Cards


Sahiner NC, Turkmen AS. The effect of DistrACTION Cards on reducing pain and anxiety during intramuscular injection in children. Worldviews on Evidence-Based Nursing 2019;1-6. (N=120, self-reported pain cards 5.67+/-3.5 v. control 7.65 +/- 2.77, p=.001. Anxiety Parent-reported cards 1.73 v. control 2.53 p=.003.)