

Distraction therapies for office-based Otolaryngology procedures performed on the upper airway

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Abstract

Objective: To assess the effectiveness of auditory and visual distraction interventions on patient discomfort, pain and anxiety during office-based Otolaryngologic upper airway procedures. **Data Sources:** Literature searches were done through Cochrane Central Register of Controlled Trials, Lilacs, MEDLINE, Embase, PsycINFO, and Cumulative Index to Nursing and Allied Health Literature. **Review Methods:** The protocol was registered in PROSPERO on August 17th 2022, under Registration number CRD42020204354. **Results:** We identified 138 records; two randomized controlled trials using virtual reality as a distraction technique in adults and one in children were included. All studies had some concerns regarding risk of bias. In adults, anxiety was lower in the virtual reality group than in the standard of care, (mean difference -16.72, 95% CI -27.19 to -6.24, $p=0.002$, $I^2=0\%$). There was no difference in procedure related pain between groups, (mean difference -0.28, 95% CI -1.24 to 0.68, $p=0.57$, $I^2=10\%$). There was no difference in satisfaction between groups (Standardized mean difference 0.18, 95% CI -0.22 to 0.58, $p = 0.37$, $I^2=0\%$). Only one Pediatric study was included hence no meta-analysis was done. Anxiety and pain were lower and satisfaction was higher in the group using virtual reality. **Conclusions:** The use of virtual reality distraction in addition to standard analgesia during office-based Otolaryngology upper airway procedures reduced anxiety in adults. It did not decrease pain or increase the level of patient satisfaction. In the paediatric population, there is a reported benefit for procedural anxiety, pain and satisfaction.

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Figure 1. PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only

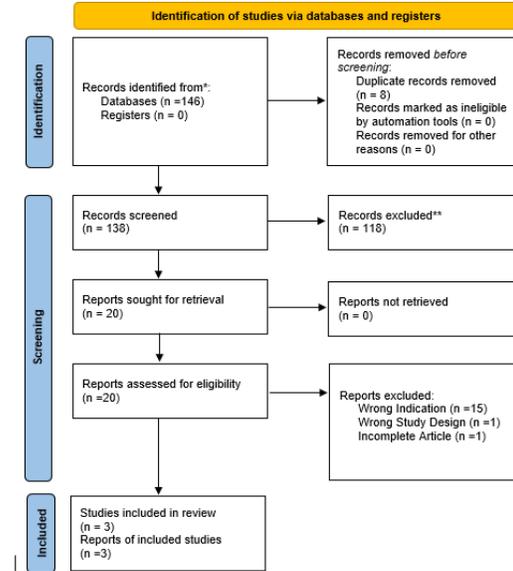


Figure 2. Risk of Bias Summary

Study ID	D1	D2	D3	D4	D5	Overall
Chang 2021						
Gray 2021						
Lui 2021						

D1 Randomisation process
D2 Deviations from the intended interventions
D3 Missing outcome data
D4 Measurement of the outcome
D5 Selection of the reported result

Low risk
 Some concerns
 High risk

Figure 3. Meta-analysis of the effect of virtual reality as a distraction intervention for anxiety during in-office otolaryngology procedures.

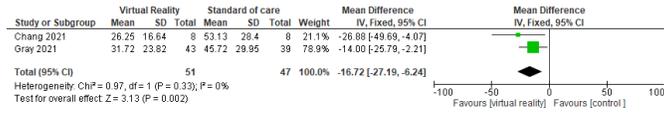


Figure 4. Meta-analysis of the effect of virtual reality as a distraction intervention for pain during in-office otolaryngology procedures.

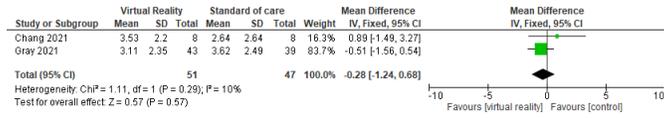


Figure 5. Meta-analysis of the effect of virtual reality as a distraction intervention on satisfaction with in-office otolaryngology procedures.

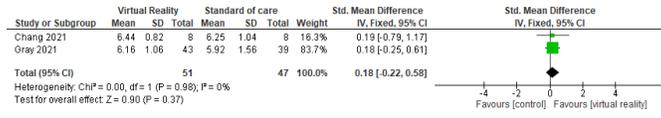


Table 1. Characteristics of Included Studies

Study ID	Design	Participants	Intervention	Control	Procedures	Device
Chang 2021	Parallel RCT	Adults (18-85)	Passive Virtual Reality VR by Corsights platform. Patients were immersed in a relaxing virtual environment on a beach with the sound of waves crashing onto a shore playing during the experience + standard local anesthesia	<ul style="list-style-type: none"> • 4 mL of 4% lidocaine applied directly onto the vocal folds through a channeled laryngoscope for laser ablation, vocal fold biopsy and BOTOX injections. • 4 mL of 4% lidocaine via a transthyroid approach in the injection laryngoplasty procedures 	<ul style="list-style-type: none"> • Vocal fold injection • Injection laryngoplasty • Intralesional steroid injection for airway stenosis • Vocal fold biopsy Laser ablation of vocal cord lesions 	Samsung Gear VR goggles with a Galaxy S9 smartphone connected via micro-USB port to provide audiovisual content.
Gray 2021	Cross-over RCT	Adults (18-65)	Active Virtual Reality - Space Burgers™ (JunoVR) game + standard local anesthesia	Topical analgesia (2 atomizer sprays, nasal phenylephrine (Neo-Synephrine) and lidocaine)	(Nasal endoscopy and debridement after FESS or endoscopic skull base surgery)	Oculus Go VR goggles and a hand-held controller
Liy 2021	Parallel RCT	Children (0-17)	Active Virtual Reality - Space Burgers™ (JunoVR) game + standard local anesthesia	Standard topical analgesia (4% lidocaine spray and nasal Neo-Synephrine)	Flexible or rigid endoscopy	Oculus Go VR goggles and a hand-held controller

VR= Virtual Reality. FESS=Functional Endoscopic Sinus Surgery. RCT= Randomized Controlled Trial.