The Effect of Music Distraction on Dental Anxiety – A Meta-analysis

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BACKGROUND

Dental anxiety and Odontophobia are troubling problems for children and adults alike, which may result in significant problems with oral hygiene and dental health. The music distraction offers an effective and side-effect-free solution to improve anxiety and increase the acceptability of dental treatment. Our meta-analysis aim is to assess the efficacy of music distraction on patient anxiety during dental painful procedures.

METHOD

PubMed and EMBASE databases up to March 2022 were searched to identify clinical controlled trials with the keywords “music” and “dental anxiety”. The primary outcome was self-reported anxiety. The Modified Jadad score was used to evaluate study quality. The standardized mean differences (SMDs) were estimated for meta-analysis with a random-effects model. Subgroup analysis was conducted by including different age groups and music style preferences.

Keywords: music distraction; dental anxiety; meta-analysis

RESULT

Study or Subgroup	Music Mean	Music SD	Music Total	Control Mean	Control SD	Control Total	Weight	Std. Mean Difference IV, Random, 95% CI
Aitken 2002-relaxing music	2	3	15	2	2.9	7	6.6%	0.00 [-0.90, 0.90]
Aitken 2002-upbeat music	1.6	2	15	2	2.9	8	6.7%	-0.16 [-1.02, 0.69]
Aravena 2020-432 Hz	8.7	2.67	15	17.2	4.6	6	5.1%	-2.48 [-3.74, -1.22]
Aravena 2020-440 Hz	8.4	2.84	15	17.2	4.6	6	5.1%	-2.49 [-3.75, -1.23]
Dixit 2020-Indian classical music	0.65	0.7	40	0.65	0.92	40	8.5%	0.00 [-0.44, 0.44]
Gupta 2017-relaxing music	2.2	3.6	20	2.7	3	10	7.2%	-0.14 [-0.90, 0.62]
Gupta 2017-upbeat music	2.6	2.7	20	2.7	3	10	7.2%	-0.03 [-0.79, 0.72]
Jindal 2011-favorite songs	4.38	0.885	15	5.07	0.73	15	7.2%	-0.83 [-1.58, -0.08]
Kim 2011-favorite songs	13.12	3.24	106	13.51	3.11	113	9.0%	-0.12 [-0.39, 0.14]
Lahmann 2008-favorite songs	36.8	9.8	28	40.5	11.2	30	8.2%	-0.35 [-0.87, 0.17]
Navit 2015-instrumental music	2.2	1.06	30	2.43	1.25	10	7.4%	-0.20 [-0.92, 0.51]
Navit 2015-movie songs	2.13	0.94	30	2.43	1.25	10	7.3%	-0.29 [-1.01, 0.43]
Navit 2015-nursery rhymes	2	0.91	30	2.43	1.25	10	7.3%	-0.42 [-1.14, 0.30]
Singh 2014-favorite songs	1.83	1.68	30	6.33	1.45	30	7.3%	-2.83 [-3.56, -2.10]
Total (95% CI)			**409**			**305**	**100.0%**	**-0.65 [-1.07, -0.23]**

Heterogeneity: Tau² = 0.49; Chi² = 75.17, df = 13 (P < 0.00001); I² = 83%
Test for overall effect: Z = 3.03 (P = 0.002)

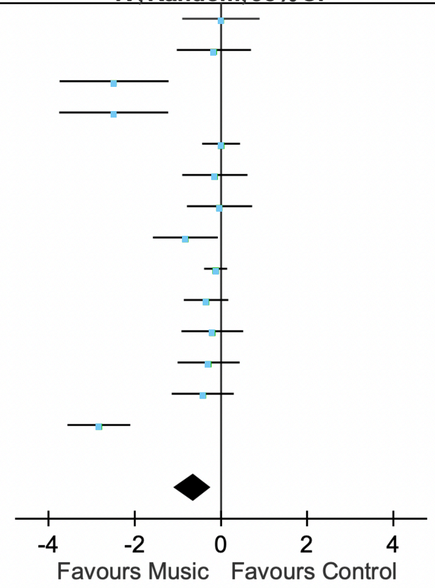

Figure 2. Forest plots of Music for dental anxiety.

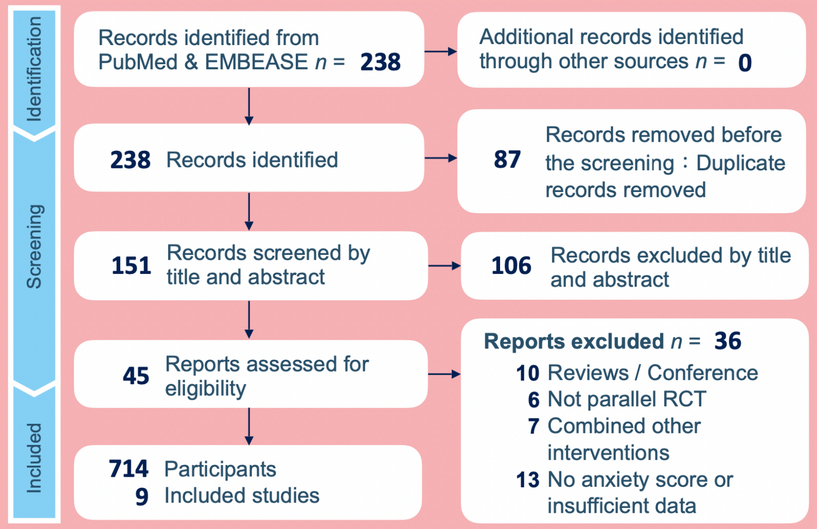

Figure 1. Flowchart of the selection strategy and inclusion and exclusion criteria for this meta-analysis.

Subgroup	*k*	Effect size (SMD)	95% confidence interval	*p*
Age group				
Adults	4	-1.14	-2.07 to -0.20	0.02
Children	10	-0.49	-1.02 to 0.04	0.07
Music selected				
Participant-preferred	4	-1.00	-2.04 to 0.04	0.06
Researcher-selected	10	-0.46	-0.88 to -0.04	0.03

***Note* /** SMD: Standardized mean difference; k: number studies

Table Subgroup analysis of age group and music selected.

CONCLUSION

Our meta-analysis provides evidence supporting that musical distraction improves dental anxiety in adults and children during dental pain procedures, independent of musical style preference.