



Does experience of music enhance olfaction: music as a potential nutrition intervention?

G. Ellender¹, P. Moynihan¹ and G. Koehne²

¹Dental School, Faculty of Health and Medical Sciences, The University of Adelaide, Adelaide, South Australia, Australia, 5000

²The Elder Conservatorium, Faculty of Arts, Business, Law and Economics, The University of Adelaide, Adelaide, South Australia, Australia, 5000

Olfaction, the sense of smell, is under recognised and underappreciated despite being vital in wellbeing. It confers a major influence on the feeding process being the major contributor of flavour and has a direct involvement in the cephalic phase responses. Along with its influence on food and nutrition, olfaction is directly associated with cognitive function and impacts social communication and safety⁽¹⁾. Loss of olfactory acuity, commonly occurring in aging and frailty, significantly influences dietary behaviour and food selection⁽²⁾. Unlike the senses of vision and audition, interventions are lacking. We propose in a proof-of-concept that crossmodal integration of olfaction and audition could inhibit olfactory decline in lifelong musicians through encouraging neuroplasticity of the olfactory brain centres. Ethical approval was obtained from The University of Adelaide Human Research Ethics Committee. Male musicians with a lifetime experience of music (ME) and naïve non-musicians (NM) aged 55 years and over were recruited through music organisations and controls through the Australian Men's Shed network. The initial target sample size was twenty per cohort. Olfactory acuity was assessed with Sniffin' sticks® (Odofin, Groningen, The Netherlands), a well validated system of a battery of three tests regimes. Sniffin' sticks represent 'felt tipped pens' impregnated with odourants presented 20mm below the nose of participants who were then prompted to 'sniff'. Assays determined participant 'Threshold', 'Discrimination' and 'Identification' of test odours⁽³⁾. Measurement of Threshold and Discrimination were undertaken in triplet fifteen seconds apart with eyes closed; measurement of Threshold being conducted in an ascending 'staircase' to detect lowest odour concentration detectable, whereas measurement of Discrimination selected the 'odd-man-out' of a triplet comprising two identical and one different odour. Measurement of Identification, with eyes open, selected the odour of a single 'pen' from a prompt list of four. All tests demanded selection. Each of the test batteries were scored out of sixteen along with total aggregate of Threshold, Discrimination, and Identification (TDI). Twenty-six participants completed the study (18 ME and 8 NM); numbers were limited owing to active COVID-19. Mean and standard deviations (SD) of Threshold, Discrimination, Identification and TDI were derived and compared between groups using 't'-test. For ME, Threshold, Discrimination, and Identification values were 6.2 (SD ± 3.7), 10.6 (SD ± 1.9), and 12.9 (SD ± 1.6). The respective values for NM were 5.0 (SD ± 2.3), 8.8(SD ± 2.9), and 10.8 (SD ± 2.5). The ME group showed a significantly higher Discrimination ($p=0.164$). Significant differences were not seen for Threshold, Identification, and overall TDI scores, however the small sample size may have accounted for this. Based on this proof-of-concept, further exploration of music is warranted as an intervention to enhance olfactory acuity to potentially improve the intake of food and nutrition, and enrich pleasure of eating and drinking, and quality of life.

Keywords: olfactory acuity; music; nutrition

Ethics Declaration

Yes

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References

1. Boesveldt S & Parma V (2021) *Cell and Tissue Res* **383**, 559–67.
2. Toussaint N, de Roon M, van Campen JP *et al.* (2015) *Chem Senses* **40**(3),197–203.
3. Rumeau C, Nguyen D & Jankowski R (2016) *Eur Ann Otorhinolaryngol Head Neck Dis* **133**(3), 203–6.