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Effects of music and essential oil inhalation on cardiac autonomic balance in healthy individuals

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Abstract

Objective: The purpose of the present study was to investigate the effect of listening to soft music or inhaling Citrus bergamia aroma on autonomic nervous system activity in young healthy individuals. STUDY DESIGN, LOCATION, AND SUBJECTS: This single-institution study was an open-label randomized controlled trial carried out on 114 healthy undergraduate students at a university located in south Taiwan.

Intervention: Participants were randomly allocated to one of four study groups including (1) a music group, (2) an aroma group, (3) a combined music and aroma group, and (4) a control group. Participants in the music group were asked to listen to preselected soft music for 15 minutes, and those in the aroma group were asked to inhale Citrus bergamia essential oil vapor generated from an ultrasonic atomizer for 15 minutes.

Outcome measure: The outcome measure involved heart rate variability (HRV) indices measured before and after the intervention. The low frequency (LF) and high frequency (HF) components of the HRV were used to quantify modulation of the sympathetic and parasympathetic branches of the autonomic nervous system.

Results: The percentage changes of normalized LF ($p = 0.003$), normalized HF ($p = 0.001$), and the ratio of LF to HF ($p < 0.001$) were significantly different among the four groups. Tukey's post hoc analysis revealed that the percentage change of normalized LF and HF were significantly different between the control group and the music group. For the percentage change of the ratio of LF to HF, the negative change in the music group, the aroma group, and the combined group was significantly different from that of the increase in the control group. In addition, no significant differences were found in the percentage changes in systolic blood pressure, diastolic blood pressure, and mean heart rate in the four groups.

Conclusions: Listening to soft music and inhaling Citrus bergamia essential oil was found to be an effective method of relaxation, as indicated by a shift of the autonomic balance toward parasympathetic activity in young healthy individuals.

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