A Review on Music-Evoked Emotional Processing in the Brain: Bridging Neuroscience Perspectives to Music Therapy in Children with ASD

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Rationale

Music-Evoked Emotional Processing

- The awareness of physical sensations may be activated through the diencephalon (thalamus and hypothalamus) and brainstem.
- With regard to music listening, the neurons of the auditory nervous system process the signals from the cochlea to the primary auditory cortex of the brain.

Current Literature and Research

- The brain structures and functions involved in emotional processing
- The brain structures and functions involved in emotional processing of children with ASD
- Music therapy and children with ASD

References


Rationale

- How music therapists apply the knowledge of neuroscience to facilitate the emotional processing in individuals with ASD
- Music therapy can facilitate emotional processing and social communication

Findings

- Both positive and negative emotional valences of emotional processing evoke amygdala and hippocampus.
- The stimuli that combine auditory and visual stimuli may increase the activation of amygdala and hippocampus.
- The nucleus accumbens can be evoked by listening to pleasant music.

Expression of emotion toward music

Recommendations

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<th>Methods/Techniques</th>
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<td>Create a musical portrait of the child’s resistant behavior by changing the child’s variations in the music, which crosses the threshold into communicative, physical, and musical gestures</td>
<td>Transform the emotional route of feeling anxious to positive emotions in the limbic system, motor and premotor cortices</td>
<td>Improvise and adapt music to meet a child’s repetitive behavior so the child hears music that matches the behavior. This can lead the child’s orientation to the music and transform the behavior into a music experience, such as the pitch of humming, the rhythm pattern of a repetitive movement</td>
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Expression of emotion toward music

- The brain structures involved in this step include: (1) the auditory cortex, (2) the orbito-frontal cortex, (3) the ventral medial prefrontal cortex, (4) the insula, (5) the inferior frontal gyrus, and (6) the cingulate gyrus.

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