Research in Autism Spectrum Disorders 3 (2009) 390–400

Contents lists available at ScienceDirect

Research in Autism Spectrum Disorders

Journal homepage: http://ees.elsevier.com/RASD/default.asp

Effects of vibroacoustic music on challenging behaviors in individuals with autism and developmental disabilities

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ARTICLE INFO

Article history:
Received 13 August 2008
Accepted 13 August 2008

Keywords:
Vibroacoustic music
Self-injurious behavior (SIB)
Stereotypic behavior (SB)
Aggressive destructive behavior (ADB)
Autism

ABSTRACT

Vibroacoustic music has been proposed to be an effective treatment for individuals with developmental disorders and challenging behaviors. The present study experimentally tested the effects of vibroacoustic music on self-injurious, stereotypical, and aggressive destructive behaviors in 20 individuals with autism spectrum disorders and developmental disabilities. The participants were randomized into two groups in a randomized controlled trial evaluation. The first group received 10–20 min sessions with vibroacoustic music treatment for 5 weeks. Then the second group received the same treatment during the next 5 weeks. Behavior was assessed using the Behavior Problems Inventory in all participants before the treatment, after the first group had completed their treatment, and again after the second group had completed their treatment. In order to evaluate each session, the accompanying assistants assessed behavior on different scales after each session. In addition, the sessions were videotaped and analyzed minute by minute for challenging behaviors. The results revealed that vibroacoustic music reduced self-injurious, stereotypic, and aggressive destructive behaviors in the participants. In addition, the results indicated that the effect of vibroacoustic music was to some extent dependent on the participants' diagnosis. Implications for vibroacoustic music theory and practice are discussed.

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doi:10.1016/j.rasd.2008.08.005

Self-injurious, stereotypical, and aggressive destructive behaviors are among the most challenging behavior problems in individuals with developmental disabilities (Schroeder, Oster-Granite, & Thompson, 2002). About 10–20% of individuals with developmental disabilities (Holden, & Gitlesen, 2006) and as many as 30–40% of those living in institutions (Deb, Thomas, & Bright, 2001b; Rojahn, Matson, Lott, Esbensen, & Smalls, 2001) show these behaviors. Challenging behaviors are most frequent in persons diagnosed with autism spectrum disorders (ASD) and tend to increase with severity of mental disability (Holden, & Gitlesen, 2006; Rojahn et al., 2001).

Chiefly, self-injurious and aggressive destructive behaviors can cause serious problems for the person and there is considerable discussion about the best way to treat these behaviors (Weiss, 2002). Among the abundance of intervention approaches, music therapy has been recommended as an effective treatment believed to be beneficial to individuals with developmental disorders and challenging behaviors (Wigram, & Gold, 2006). Music therapy involving vibrations, i.e., vibroacoustic music, may be especially effective. In vibroacoustic music, use is made of specially designed speakers built into a chair, bed, or other equipment to administer low frequency sound vibrations that enable the listener to hear and physically feel the music. Vibroacoustic music technologies originated in Scandinavia in 1970s (Skille, 1989) and have since enjoyed widespread use in hospitals, health care facilities, and wellness programs.

Music alone evokes genuine emotion in listeners (Lundqvist, Carlsson, Hilmersson, & Juslin, in press) and in combination with low frequency sound vibrations, vibroacoustic music is believed to enhance the emotional reaction to music. Vibroacoustic music has been found to reduce muscle tone and spasms (Skille & Wigram, 1995; Wigram, 1993a, 1993b) as well as pain (Michel & Chesky, 1995). Moreover, vibroacoustic music has been reported to reduce anxiety (Ruutel, Ratnik, Tamm, & Zilensk, 2004; Wigram, 1993a) and autonomic nervous system activity, as indicated by decreased blood pressure or heart rate (Skille & Wigram, 1995; Wigram, 1996) and increased finger temperature (Standley, 1991, 1992). Therefore, vibroacoustic music may enhance the relaxing effect induced by music, and has been shown to have curative effects on diverse clinical groups (Skille & Wigram, 1995).

Individuals with intellectual disability may experience symptoms of anxiety at a greater level compared with the general population (Deb, Thomas, & Bright, 2001a) and this is observed early in life (Emerson, 2003). Anxiety has been reported to be more prevalent in those exhibiting challenging behavior (Moss et al., 2000) and in individuals with ASD (Gillberg & Coleman, 2000; Kim, Szatmari, Bryson, Streiner, & Wilson, 2000). In addition, many individuals with ASD show symptoms of autonomic dysfunction (van Engeland, 1984) and children with ASD may use overt behavior to control a malfunctioning autonomic nervous system (Hirstein, Iversen, & Ramachandran, 2001).

Therefore, based on the evidence that vibroacoustic music affects autonomic activity and reduces anxiety, vibroacoustic music has the potential to benefit individuals with challenging behaviors. In fact, vibroacoustic music was early proposed to have positive effect in this regard (Wigram, 1997). However, only a few studies have addressed this issue empirically (Wigram, 1993a, 1993b). These studies indicate positive results with vibroacoustic music; the results are, however, based on only a few participants. In addition, thorough reviews reveal the lack of randomized studies evaluating vibroacoustic music (Gold, Wigram, & Elefant, 2006; Wigram & Gold, 2006). Therefore, the present study was performed in order to more systematically investigate the proposed effects of vibroacoustic music on self-injurious, stereotypical, and aggressive destructive behaviors in individuals with ASD and developmental disabilities.

1. Method

1.1. Participants

Twenty persons, 13 men and 7 women, with developmental disabilities participated in the study. Their ages ranged from 22 to 57 years (M = 37 years, S.D. = 9.9). Participants were recruited from ten public residential units for mentally disabled people. All participants had been diagnosed with mental retardation (mild = seven, moderate = five, and severe = eight). Ten of the participants had been diagnosed with ASD. The participants displayed 3–42 behavioral problems (M = 18.9, S.D. = 12.2). According to baseline Behavior Problems Inventory (BPI) measures, 13 participants displayed self-