



Physiological effects of mandala making in adults with intellectual disability

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ABSTRACT

This study investigated mandala making as an effective physiological stress reducer for individuals with intellectual disability. Stress levels were measured using systolic and diastolic blood pressure and pulse. Participants ($N=15$) engaged in three activities, serving as their own controls: mandala making, free drawing and a neutral control condition. Findings revealed no significant differences in changes in stress measures across the three conditions, however, t -tests of blood pressure change in the mandala making condition indicated a statistically significant reduction in both diastolic and systolic pressure between the first and third reading; similar differences were not found in the other two conditions. These findings suggest that mandala making is an effective stress reducer for those with intellectual disability, however, evidence does not show it is more effective than the control conditions. Suggestions for future research are discussed.

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Individuals with intellectual disability (ID) (also known as mental retardation) are at risk for experiencing psychological stress (Chaney, 1996; Janssen, Schuengel & Stolk, 2002) and physical stress resulting from repeated stress responses (Chaney, 1996; Neumann, Chi & Fleming, 2000). Lunsy and Bramston (2006) raised the possibility that this might be due to the appraisal processes they use when faced with situations they perceive as stressful. If prolonged, these negative perceptions and emotions can jeopardize immune system functioning and increase susceptibility to viruses and diseases as the stress response is activated again and again (Lovallo, 2005).

The “stress response” is elicited by a *stressor*, a term coined by Hans Seyle; it is any agent (or threat) that evokes a stress response (Everly & Lating, 2002; Lovallo, 2005). The *stress response* is the psychophysiological reaction to a stressor and is characterized by a broad range of reactions. Physically, one can experience increased sympathetic activity: elevated blood pressure, heart rate and respiration as well as decreased parasympathetic activity (relaxation response) (Everly & Lating, 2002). In addition, stimulated endocrine response, including increases in epinephrine (adrenaline) and cortisol levels may occur (Everly & Lating, 2002; Lovallo, 2005). Psychologically, negative perceptions of what is occurring (such as a perceived inability to cope) or what could occur can increase negative emotions such as anxiety or depression (Everly & Rosenfeld, 1981), fear or anger (Lovallo, 2005) as well as create feelings of helplessness, loss of control, or failure.

Stress experienced by individuals with ID also could be attributed to socially and psychologically difficult experiences. Research suggests that interpersonal difficulties play a major role in the stress levels of persons with ID (Bramston, Bostock & Tehan, 1993; Bramston, Fogarty & Cummins, 1999; Hartley & MacLean, 2005). This may be related to prolonged negative social conditions including the stigma of their disability, the label of ID, ridicule, rejection, discrimination, restricted opportunities, and ostracism (Reiss & Benson, 1984). Eaton and Menolascino (1982) proposed that due to overall low interpersonal coping abilities and high occurrence of central nervous system impairment, those with ID are at an increased risk for developing associated psychiatric disorders from adjustment disorders to schizophrenia. In a study on the perceptions of stress and coping strategies of adults with mild ID, Hartley and MacLean (2005) found that stress over interpersonal reactions and personal competencies occurred most frequently. They suggested that it is important not only to reduce stress but also to increase perceptions of the capacity to control stress for these individuals.

Chaney (1996) conducted a study on psychological stress with those diagnosed with profound ID and found that when presented with unpleasant stimuli, participants demonstrated elevations in heart rate, blood pressure, respiration rate, as well as core and peripheral body temperature changes. Results showed the greatest negative reactions occurred when participants were stared at during the clinical examination. Chaney attributed these reactions to the “insecurities of people whose disabilities prevent them from adjusting to perceived threats” (p. 305), which suggests that individuals with ID may lack the coping resources necessary to reduce the impact of threats or to remove themselves from perceived

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threats. Janssen et al. (2002) found that those with severe and profound ID appeared more vulnerable to stress and utilized less effective coping strategies. They emphasized that if resources are not available at the time of appraisal of stress, a feeling of helplessness is likely to occur, and the stress may be perceived as uncontrollable.

Studies on the use of art therapy for stress reduction suggest it is an effective alternative therapy (Bell & Robbins, 2007; DeLue, 1999; Henderson, Rosen & Mascaro, 2007; Kuchta, 2008), though no research was found specifically linking art therapy with stress reduction in persons with ID. Benefits of art therapy for this population have been noted by a few authors including Segal (1991) who observed that expressive therapies, including art therapy, could help elderly persons with ID expand their communication and social skills, resulting in reduced social isolation and withdrawal. Harlan (1991) created a pilot art therapy program for persons with ID and observed that it positively impacted self-esteem, attention span and positive expression of emotions, including anger or sadness over loss. Participants also experienced increases in autonomous functioning, better fine motor coordination, and a reduction of self-injurious behaviors as a result of making art. Bowen and Rosal (1989) reported a case study of art therapy treatment that helped a client with ID experience a sense of accomplishment and internal control, lessen feelings of helplessness, and reduce behavioral difficulties in a social setting. Wilson (1977) similarly reported a case study in which the client's perseverance in art making provided a pleasurable release of tension.

More broadly, art making has been considered by many art therapists to be a relaxing activity, capable of reducing tension and anxiety (DeLue, 1999). Rubin (1999) suggested that there has been a long held belief among art therapists that making art can reduce stress and improve mood. Bell and Robbins (2007) indirectly tested this long held belief in the form of a randomized, controlled trial; their findings revealed significant reductions in negative mood and anxiety in an art-making group compared to a control group who viewed a series of art prints. Other studies have shown the effectiveness of specific art therapy interventions, including coloring mandalas, for reducing anxiety (Curry & Kasser, 2005) and depression levels (Gilroy, 2006) in general populations.

Studies have begun to suggest the effectiveness of mandala making for reducing stress and other symptoms (Curry & Kasser, 2005; DeLue, 1999; Henderson et al., 2007; Kuchta, 2008). Mandalas are art forms created using a circular format. In Sanskrit, the word mandala means "whole world" or "healing circle" (Goodwin, 1993), and the term is used to describe circular art used traditionally in various Eastern cultures for meditation (Storr, 1983). Carl Jung was the first to utilize mandala making personally and professionally for the purpose of psychotherapy (DeLue, 1999). He used mandala making as a way of producing "a calming or centering effect on its creator" (Jung, as cited in DeLue, 1999, p. 47). When speaking about the experiences of his patients, Jung highlighted their emphasis on the positive or "soothing effects" (Jung, 1936–1955/1969, p. 361) they experienced when creating a mandala.

Curry and Kasser (2005) investigated the impact of coloring mandalas on anxiety, examining anxiety levels pre- and post-coloring a mandala, a plaid form, or drawing on a blank piece of paper. They found that anxiety levels declined in both the mandala and plaid-coloring groups, suggesting that coloring of geometric patterns may induce a meditative state, benefiting those who experience anxiety.

Henderson et al. (2007) examined the effectiveness of mandala creation versus writing in aiding the processing of traumatic events for individuals with symptoms of post traumatic stress disorder (PTSD). PTSD symptoms, depression, anxiety, spiritual meaning and frequency of physical symptoms and illnesses were measured prior to drawing a representation of emotions related to an experience

of trauma within a circle. The control group was assigned to draw a specific object such as a cup or bottle. Findings revealed that at one-month follow up there was a significantly greater reduction of PTSD symptoms for the mandala group.

Two studies used physiological measures to test whether mandala making might induce relaxation. DeLue (1999) tested the effects of mandala making on physiological changes in children five to ten years old by measuring changes in heart rate and skin temperature pre- and post-intervention. Her work sought to substantiate Jung's assertion that mandala creation has "a calming or centering effect on its creator" (Jung, as cited in DeLue, 1999, p. 47), and thus elicit a parasympathetic or relaxation response. Results revealed a statistically significant decrease in heart rate, but no significant change in skin temperature, post mandala making, providing preliminary evidence for the hypothesis that mandalas can induce a relaxation response.

Kuchta (2008) examined physiological and psychological effects of mandala making for cardiac rehabilitation patients. She measured heart rate variability and mood pre- and post-mandala making versus a control condition. Those in the mandala condition had significantly increased heart rate variability, suggesting they experienced a greater relaxation response than those in the control group. There was also significant positive mood response with the mandala group compared to the control.

The extant research suggests that mandala making may promote relaxation and decrease stress levels. We investigated whether mandala making would reduce stress for individuals with ID as indicated by two physiological stress measures: blood pressure and pulse. It was hypothesized that participation in mandala making would significantly reduce both physiological measures, indicating a decrease in sympathetic nervous system activity and an increase in the relaxation response.

Methods

Participants

The sample was comprised of middle-aged and older adult men and women with ID who attended a day program at a non-profit agency. Recruitment letters and informed consents were sent to the guardians of 24 potential participants and 19 volunteered to participate, 10 males and 9 females ranging in age from 55 to 74. Participants' diagnoses ranged from mild to severe ID.

Instruments

Physiological monitoring equipment included three home blood pressure monitors, including two Omron HEM-780 Automatic Blood Pressure Monitors and one American Diagnostic Corporation 6013 Digital Blood Pressure Monitor. Omron HEM-780 Automatic Blood Pressure Monitors are tested according to the protocols of the Association for the Advancement of Medical Instruments (AAMI) and the European Society of Hypertension (ESH). American Diagnostic Corporation 6013 Digital Blood Pressure Monitors are tested according to the protocols of the American Diagnostic Corporation (ADC). Equipment was chosen based on availability to the researcher. The arm cuffs of the equipment were placed on and removed from each participant by the researcher and/or research assistant.

Prior to the study, and in order to account for potential confounds of the blood pressure machine arm band which remained on participants arms for 15 min, the procedure was tested to ensure that leaving the arm band on would not increase any of the physiological measures. Nine acquaintances of the researchers sat in a resting pose on a couch and had their blood pressure/pulse taken 6

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