Moving Through Depression: Development of a Dance/Movement Therapy Method in Psychiatric Inpatient Care

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Moving Through Depression:
Development of a Dance/Movement Therapy Method in Psychiatric Inpatient Care
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Abstract

Short-term psychiatric hospitalization is a challenging health care model due to its short duration of care, treating the highest risk psychiatric population. Priority care within a short-term psychiatric hospitalization involves monitoring a patient’s safety for stabilization by decreasing acute mental health symptoms. Holistic psychotherapy treatment options are needed to meet the severity of patients’ symptoms for effective stabilization within a short-term model of care. This paper investigates the first implementation of a dance/movement therapy (DMT) method within two short-term units in a notable Boston hospital. The DMT group called *Mindful Movement* was facilitated weekly as single sessions to adults ranging from ages 19-67 with severe symptoms of suicidality and self-harm, depression, obsessive-compulsive behaviors, and anxiety. This paper considers four of those single session groups. This method incorporates theories of DMT practice, mindfulness, and tai chi as the theoretical foundation to the DMT framework. The literature will review the hospital setting, population’s diagnoses and symptoms, and articulate the relevancy of these theories for a holistic approach to treating this population’s acute needs. The method section will outline the DMT group framework in detail with treatment objectives, and goals including my process of developing this group. *Mindful Movement* was observed to reduce patient anxiety and depressive mood symptoms by relaxing patients mentally and physically. Patients were able to identify a physical connection to their mental health symptoms. This thesis offers a unique DMT approach that is suitable for short term inpatient care. It is my hope to inspire further research of expanding DMT with this patient population.

*Keywords*: dance/movement therapy, depression, inpatient, mindfulness, short-term
Moving Through Depression: Development of a Dance/Movement Therapy Method in Psychiatric Inpatient Care

I am a dancer. I believe that we learn by practice. Whether it means to learn to dance by practicing dancing or to learn to live by practicing living, the principles are the same. In each it is the performance of a dedicated precise set of acts, physical or intellectual, from which comes shape of achievement, a sense of one's being, a satisfaction of spirit.

—Martha Graham, dancer and choreographer

The World Health Organization predicts that by 2020 depression will be “the second most disabling illness after ischemic heart disease” (Mala, Karkou, & Meekums, 2012, p. 288). With growing rates of depression, the need for more psychotherapy treatment options is apparent. This paper investigates dance/movement therapy with adults at a prestigious psychiatric hospital in the Boston metro area. I had the opportunity to be the first to implement DMT as a new group therapy option on two short-term units. I facilitated dance/movement therapy as a single session intervention for adults at the acute level of care treating adults with symptoms of suicidality and self-harm, major depression, obsessive compulsive behaviors, and anxiety. Due to the nature of the short-term unit treating patients on average of two to four weeks, each single session was facilitated with the same group structure to welcome new patients who have not experienced DMT or other body-oriented therapy.

Dance/movement therapy (DMT) is a psychotherapeutic practice that incorporates movement of the body, “promoting emotional, social, cognitive, and physical integration of the individual, for the purpose of improving health and well-being” (American Dance Therapy Association, 2014, para. 1). DMT integrates the whole person connecting the mind and body through a combination of movement and talk therapy. My objective of this investigation was to
analyze DMT within an acute hospital treatment model and demonstrate the potential benefits of this treatment to relieve acute symptoms of major depression and anxiety. The goal of this intervention is to reduce acute symptoms through DMT including practices of mindfulness by creating a safe and relaxing therapeutic group environment for stabilization. This investigation reviews the DMT method presented on each unit by addressing patients’ physical states and moods before and after session. The literature review begins with short-term hospitalization practices, patient population, and standard hospital treatment protocol. I review applicable concepts of DMT and mindfulness practices, connecting these foundational theories to this method’s therapeutic goal of mental stabilization by effectively reducing anxiety and stress within a single session. The review articulates the connection of DMT and mindfulness theories noting studies with beneficial holistic health outcomes for adults in mental health treatment.

This paper describes the format of this DMT method in detail, discussing the objective of each part of a session including intro and greetings, tai chi inspired warm-up, movement directive, meditation, processing discussion, and closure. Number of attendees by age and gender, setting, and group formation is noted. Group dynamics are included describing my movement assessments of each group experience. Specific topics of discussion include this population’s prevalent mental health symptoms including mood, anxiety, and personality disorders and possible symptomatic effects on the body considering posture and tension. I assess the group attendees through verbal assessment and movement observation. It is important I make note of each individual patient verbally and nonverbally to adjust the group format to their readiness and capabilities. Within group discussion I observed patient’s verbal feedback making note of shifted moods, including notable shifted physical states and postures that may result from the therapy given (e.g., a patient may start with curved posture and focused gaze on the ground
with hands and arms bound close to stomach. A shift may be that the patient’s focus rises to the group by acclimating oneself to the room. Posture may rise, and hands and arms may be more relaxed). Results will include my observations and patient feedback, limitations, and common themes of each of the unique sessions facilitated.

The Discussion evaluates general results of the group process, patient feedback, and concluding thoughts. I will additionally include this method’s limitations and note if group objectives were not achieved. Through the expression of mindful movements, dance, and group discussion I will conclude if this method’s theories and group sessions are an effective alternative psychotherapy treatment to alleviate this population’s symptoms within short-term inpatient care.

**Literature Review**

This investigation considers DMT as a newly added psychotherapy group for an acute population within short-term inpatient care. The following focuses on the hospital setting, patient population, and current treatment practices. Additionally, I review holistic treatment theories, DMT concepts and theories that incorporate eastern theories of mindfulness. Here I define these theories of practice including qualitative and quantitative study outcomes of DMT, mindfulness meditation, and conscious movement studies for severe mental illness. Positive outcomes from these studies are noted, justifying the relevancy of these practices for this method’s group therapy framework.

**Hospital Setting and Patient Population**

This high-risk population is treated for severe mental health conditions including suicidal attempt, suicidal intent, and suicidal ideation. This population is diagnosed based on *The Diagnostic and Statistical Manual of Mental Disorders, 5th edition* (DSM-5; American
Psychiatric Association [APA], 2013). The common diagnoses on these units include bipolar disorders, depressive disorders, anxiety disorders, obsessive-compulsive disorders, eating disorders, substance-related disorders, and personality disorders. The majority of the population treated is Caucasian, cognitively high functioning, and of middle to upper class socioeconomic backgrounds from the Boston metro area.

At this acute level of care, managing mood and addictive self-harm behaviors is closely monitored by all unit staff. Main goals within an inpatient psychiatric unit are to protect patient’s life and safety, decrease suicidal intent or ideation and to improve interpersonal and psychosocial factors (Bongar & Sullivan, 2013). Approaching each patient within this setting requires a level of therapeutic care that is sensitive to the fragile and labile states of patients. This requires close attention to each patient, assessing safety precautions. “It is crucial that all assessment, treatment, and management decisions, etc. and all activities and interactions be meticulously and contemporaneously documented” (Bongar & Sullivan, 2013, p. 239). Safety checks are accounted for every 5 to 15 minutes depending on the patient’s risk of self-harm.

This inquiry’s hospital setting has a world renown reputation for advancement in psychiatry and psychopharmacology treatment of severe mental disorders. It has been ranked the number one psychiatric hospital nationally. The average stay for a patient within the short-term units is two to four weeks but longer stay is necessary if acute symptoms do not improve. Patients are assigned to individual treatment teams including a psychiatrist, nurse, and social worker. A patient’s daily treatment includes meeting with the treatment team to discuss medication management, treatment options such as electroconvulsive therapy treatment (ECT) or transcranial magnetic stimulation (TMS) treatment, or continued treatments of ECT or TMS. These meetings assess treatment goals including skills and strategies for symptom management,
social engagement, and group therapy attendance. Medication management, ECT, and TMS, are the short-term’s priority management of care; however, a combination of medication management and group therapy may prove to be more effective treatment than medication alone. Ambresin, Despland, Preisig, and de Roten’s (2012) study recommends combined psychotherapy and medication treatment within short-term inpatient care; however, they argue that “antidepressant drugs and various types of psychotherapy, psychodynamic psychotherapy is unlikely to be a universal therapy for depression” (p. 7). An array of group therapy options within inpatient care is necessary to meet the scope of patient needs within the short-term care.

This inpatient setting offers group therapy every hour. Prior to my DMT group addition, weekly rotating groups included dialectical behavioral therapy focusing on skills for mood regulation, cognitive behavioral therapy focusing on how thoughts, feelings and behavior influence each other, acceptance and commitment therapy, addictive behaviors, spirituality group, peer support group, and expressive arts therapies including art modalities such as creative writing, visual arts, improv, and music therapy. Yoga and meditation groups are offered; however, they are not psychotherapeutic groups. The consistent daily group schedule is optimized for treatment due to the nature of the acute short-term care model. “Despite the large number of studies on treatment of depression, there is a clear lack of controlled research in inpatient psychotherapy during the acute phase of a major depressive episode” (Ambresin et al., 2012, p. 1). More research is needed for this acute population within the short-term treatment model. This investigation will be the first implementation of DMT within this hospital’s short-term units proposing a more effective group therapy option that includes both movement and psychotherapy within one group.
Alternative psychotherapy practices that approach the mind and body like DMT and mindfulness may be an additional effective group therapy to relieve symptoms of anxiety and depression, the most common effects of the various disorders treated within these units. Key symptoms of anxiety include, “excessive worry associated with fatigue, restlessness, irritability, muscle tension, difficulty concentrating, or sleep disturbance” (APA, 2013, pp. 122-123). The APA’s (2013) criteria of major depression include,

Depressed mood most of the day, nearly every day, diminished interest or pleasure in activities, weight loss or weight gain, insomnia or hypersomnia, psychomotor agitation or retardation nearly every day, fatigue loss of energy, feelings of worthlessness or excessive or inappropriate guilt, diminished ability to concentrate, recurrent thoughts of death, recurrent suicidal ideation, attempt or specific plan for suicide. (p. 94)

As noted in the criteria, depressive mental health symptoms affect the whole body, contributing to low motivation that can physically disable the body. Depression can be physically immobilizing, causing isolation, thus physically manifesting in heavy tension within the body (Punkanen, Saarikallio, & Luck, 2014). At this acute level, I have observed depressed patients to be both cognitively and physically stuck with lack of motivation to move. An objective is to assess this DMT method as a psychotherapeutic treatment that addresses both mental and physical effects of acute mental illness.

**Dance/Movement Therapy and Mindfulness**

DMT starts with the body. The fundamentals of DMT acknowledge movement and dance as communication that “fulfills a basic human need” (Chaiklin & Schmais, 1979, p. 16). The development of self-concept starts with bodily sensations. It is through one’s felt experiences (i.e., visual, auditory, olfactory, tactile, taste, thermal, pain, synthetic, kinesthesia
(Capello, 2009) that we develop a body image. Capello (2009) states, “the body image refers to the body as a psychological experience; it focuses on the individual’s feelings and attitudes toward his or her own body” (p. 80). This human experience begins through movement and tactile sensations to survive by wiggling, pushing, sliding, and tasting until a child can separate from the environment and others (Capello, 2009).

The core DMT concept of body action (Capello, 2009; Chaiklin & Schmais, 1979; Levy, 2005), by mobilizing the whole body and its senses, using the body as vehicle, DMT “offers individuals the opportunity to become aware of and re-attune their kinesthetic sense (Capello, 2009, p. 83). The developed approach to my method proposes it is essential for this acute population to start stabilizing their symptoms through sensing, by focusing on the breath to reconnect to the body, feeling the body’s weight through relaxed movements, establishing awareness of their internal felt experience. Movement starts with the breath.

Mindfulness within psychotherapeutic practice includes basic concepts such as “attention, presence, concentration, and breathing” (Neves-Pereira, Bilibio de Carvalho & de Campos Aspesi, 2018, p. 151), while focusing on the five senses. Similarly, these concepts are used within DMT theories of practice. Caldwell (2016), developed a theoretical framework influenced by mind-body theorist Eugene Gendlin, and Zen Master Tich Nhat Hanh, called the “Moving Cycle.” The “Moving Cycle” of recovery starts with the first phase of awareness. Caldwell describes this practice of awareness within therapy,

It commences as therapy begins, and it begins each session. It involves focusing our attention on sensations, feelings, and thoughts in an impartial, descriptive, and nonjudgmental way. First and foremost, healing seems to be a phenomenon of accessing and mobilizing high quality attention. If we have been trained to stop attending to the raw
data of our direct experience, then we are unable to listen to coherent body signals and participate fully in self-regulation. (pp. 251-252)

This first step of establishing self-awareness within my method is emphasized. I will describe how I incorporate a warm-up of finding the body-mind connection through focused breathing and tai chi inspired movement phrasing to achieve an embodied state.

The purpose of incorporating mindfulness practices into my DMT method is to achieve a state of grounded and secure embodiment to reduce the underlying anxiety at the beginning of session. I facilitate guided meditation with an emphasis of focusing on the physical body and its senses to help the patients achieve this grounded relaxed state. “Being grounded or having the sensation of feeling stable and secure while connected to the earth provides patients with a safe place to begin their movement exploration” (Capello, 2009, p. 82). Current research studies define mindfulness as “a nonjudgmental attention to experiences in the present moment” (Hölzel et al., 2011, p. 538). Common parts of mindfulness meditation include: “1. Attention regulation 2. Body awareness 3. Emotion regulation and 4. Change in perspective on the self” (Hölzel et al., 2011, p. 539). Numerous studies have shown that incorporating mindful breathwork and meditation into therapy can alter aroused states affected by trauma and anxiety (Surmitis et al., 2018; Hölzel et al., 2011). Within a literature review of meditation research studies, Surmitis et al., (2018) discuss the current growth of mindfulness research studies noting that 595 studies on meditation treatment alone for “anxiety, stress pain, blood pressure, anger, addiction, and depression” (p. 5) resulted in positive outcomes.

Often a combination of stillness and movement in a DMT session open more opportunity to explore emotional and physical states. Biondo (2019) proposes stillness within DMT shares similarities to Eastern philosophies of mindfulness, stating the void gives space for
creativity to emerge. She states, “stillness coupled with moments of movement and dance complement one another to help the patient find balance through which growth can occur” (Biondo, 2019, p. 119). From my experience, typically acute patients are not ready to move however, this DMT approach of providing space to solely be present and warm up by breathing together gives the patient space to explore the void safely, while being accepted and supported within the contained setting.

Integrating mindful movements influenced from tai chi into DMT may be appropriate to address exacerbated mental health symptoms. Slow breath work incorporating focused repetitive movement phrases inspired from practices such as tai chi help relax the mind as well as change poor body postures that result from depression (Punkanen, Saarikallio, & Luck, 2014). Tai chi incorporates similar aspects incorporated within DMT practice such as conscious breathing, integrating a full body connection to one’s movements and use of space. Influenced tai chi movements integrate concepts of mindfulness into an active moving meditation. Wang et al. (2014) conducted a meta-analysis on studies using tai chi practice as an intervention for the treatment of depression, anxiety, and psychological well-being. They state,

slow, focused movements of tai chi may counteract erratic movements and thoughts by increasing awareness of and eventually releasing muscle holding patterns and their associated emotions caused by stress. The studies in this review demonstrated that mind-body interventions such as tai chi have beneficial effects for various populations in range of psychological well-being measures including depression, anxiety, and general stress management. (Wang et al., 2014, p. 615)

The practice encourages presence while focusing on the sequences that warm the body. “Tai chi encourages a focus on the present moment and awareness of body positions and sensations. Slow
deliberate movement with simultaneous mindful attention to one’s breathing, and body may promote relaxation” (Niles et al., 2016, p. 2). I have observed that warming up by syncing the breath with basic tai chi like sequences is a good preliminary exercise to exploring personal range of movement. It is also helpful for DMT assessment to consider the individual’s movement preferences, abilities, and emotional readiness for deepening the movement session.

**Cultural Competency Within Mindfulness Practice**

The notion of eastern philosophies of mindfulness within psychotherapeutic practice including basic concepts such as “attention, presence, concentration, and breathing,” (Neves-Pereira, Bilibio de Carvalho & de Campos Aspesi, 2018, p. 151) additionally the notion of awareness and stillness within DMT theories (Caldwell, 2016; Biondo, 2019), must be recognized closely with healing objectives. It is necessary to culturally understand mindfulness roots of meditation stemming from classical Buddhist beliefs. Buddhist practice follows four noble truths. These truths are,

1. Suffering is a ubiquitous state of affairs; 2. conditioned attachment is the root of suffering; 3. it is possible to escape from this cycle of attachment and suffering; and 4. proper mindfulness, in conjunction with other practices, are both necessary and sufficient for the alleviation of this suffering. (Farb, 2014, p. 1064)

The notion of the “eightfold path” to understanding these noble truths includes: “right intention and effort to pursue the path, wholesome intentions, thoughts, speech, action, and vocation and of mindfulness practice itself” (Farb, 2014, p. 1064). Understanding these classical Buddhist beliefs in the context of secular clinical practices of mindfulness, Neves-Pereira et al., (2018) caution against the interpretation of mindful healing concepts used within western psychoanalytic theory to these deeper Buddhist philosophies.
Psychoanalytic theory, the foundation of western psychodynamic theories, which holds the concept of the individual ego, and the internal focus of self for growth and healing, contradicts classical Buddhist beliefs of the meditative focus (Neves-Pereira et al., 2018). Focusing on mindfulness meditation within a psychoanalytic and psychodynamic framework, where healing and change come from restoring one’s individual identity through self-reflection, “may lead to mindful monitoring of goals and values that are antithetical to Buddhist values, such as attachment, striving, and self-affirmation” (Farbs, 2014, p. 1071).

The common western approach to mindful meditation is with a “nonjudgmental, present-centered awareness” (Farbs, 2014, p. 1071). When comparing the concept of mindfulness within Buddhism, Farbs (2014) argues,

it was never supposed to refer to the complete absence of judgment; rather, the use of mindfulness is intended to provide a form of lucid awareness in which clear discernment of right and wrong are made available, which is then used to guide adaptive behavior. (p. 1071)

Secular mindfulness approaches within psychotherapeutic practices focus on the individual’s beliefs and worldviews, without imposing concepts of morality, and “has to be adapted to the cultural nuances of the individual practicing it” (Surmitis el al., 2018, p. 9). As a clinician facilitating mindfulness within psychotherapy, it is important to understand the origins of the practice and individual’s interpretations of mindfulness in risk of imposed biases or spiritual beliefs. Surmitis et al. (2018) note it is the counselor’s ethical obligation in understanding the intention of meditation within their practice with an understanding of cultural origin and context.
Theoretical Dance/Movement Therapy Framework

Dance/movement therapy attends to the body and its posture and how it influences perception, tensions held within the body that might inhibit action or feeling, the awareness of the breath as it is used or withheld, and the sensory use of touch. (Chaiklin, 2009, p. 10)

My proposed method includes core theoretical DMT concepts of symbolism, therapeutic movement relationship, group rhythm, and as discussed prior, body action. These DMT fundamentals are used to further guide and expand one’s movement repertoire (Chaiklin & Schmais, 1979, pp. 16-19). This theoretical model stems from DMT pioneer, Marian Chace, and is used by many as the principle framework of their DMT practice (Chaiklin & Schmais, 1979). Within this theoretical framework I am continuously assessing the patient’s body attitude, posture, and movements, considering how it may be a reflection of their emotions, self-esteem, or body disconnect.

It is a dance/movement therapist’s understanding that movement can affect our psychological well-being and, that “when speaking of the body we are not only describing the functional aspects of movement, but how our psyche and emotions are affected by our thinking and how movement itself effects change within them” (Chaiklin, 2009, p. 5). The dance/movement therapist empathizes to the patient’s emotional states by attuning to their posture and movement qualities (Young, 2017). Through the therapist’s emotional attunement, a movement relationship is developed between patients and therapist. While moving together in the group this may be, “sensing how to expand the relationship through reflecting, expanding, or completing a patient’s tentative movements” (Chaiklin & Schmais, 1979, p. 18). Throughout the group I adjust my movements and connect to each patient by reflecting their quality of
movements and range of motion. A movement dialogue is established, and I begin to pick up patient’s motivation or lack of motivation to move. Young (2017) describes the therapeutic movement dialogue,

Empathy develops out of attunement to the affective changes of the reciprocal movement behavior, resulting in the “consciousness of oneself as an embodied individual” (Fischman, 2009, p. 46). Thus, the enacted embodied approach of DMT is manifested in the therapeutic relationship, through the observer/participant role of the dance/movement therapist, promoting an environment of safety, respect, and trust from which new ways of being in relationship and related emotional experiences can develop. These new ways of relating unfold through a spontaneous movement dialogue that arises through attuning to the client’s movement qualities. It is within this movement dialogue where two subjective perspectives come together for the purpose of understanding one. (p. 97)

Throughout the group I am assessing patients’ willingness or difficulty to move. Depending on the group development and group’s readiness, I ask each patient to share a stretch or spontaneous movement to the music. Through reflection and attuning to each individual’s stretches or movements, I repeat and expand the movements into a phrase that the group can pick up, thus creating a group rhythm.

As the group finds a rhythm and synchronizes, I use symbolism by connecting movements to metaphors (e.g., legs like strong tall planted trees with even weight into the ground, and relaxed arms like swaying branches in the wind). I use a movement observation framework, Laban Movement Analysis, to assess, guide, and expand quality of movements by suggesting movement efforts (e.g., flow, weight, time, and use of space) (Dell, 1970). I guide the patients with symbolic metaphors and these effort qualities to help those who may be stuck or
have not had the opportunity to explore movement freely. Guided imagery and movement descriptions open opportunities for new expressions.

**Dance/Movement Therapy Treatment for Depression**

Research suggests that body movement and posture contribute to an individual’s mood (Peper & Lin, 2012). Peper and Lin (2012) suggest poor posture can significantly increase depressive symptoms and that it may be possible to decrease the symptoms with active body postures. Results from their study showed improved mood with adjusted posture and active movement. Koch, Morlinghaus, and Fuchs (2007) investigated a single session DMT intervention with depressed psychiatric patients. Their study suggests patients with depression have similar body patterns such as shorter gaits and velocity, as well as decreased vertical movement and more sway movements from the upper body. Expanding movement phrases and stretches within the vertical plane of movement, may shift the poor posture that is often carried (e.g., stretching the arms straight up or out to the sides while shifting focus to the ceiling).

Additional studies have researched the short-term effects of DMT for the treatment of depression. Mala et al. (2012) reviewed studies of the short-term benefits from exercise alone, however, the literature states that group DMT model has the added benefit of social interaction, also “socio-cultural communication” (p. 289) that is encouraged in dance participation. DMT encourages social connection as well as provides the opportunity for introspection. Papadopoulos and Röhrich (2014) found by incorporating body-oriented psychotherapy, patients were able to understand how their depression influenced their “body sensations and movement patterns” (p. 129). A patient from this study stated, “I didn’t realize that by changing my posture I would feel better about myself” (p. 175). Using dance and movement exercises can build body self-awareness and cognitive connection of one’s felt experience. Additionally, Punkanen et al.
(2014) conducted a short-term DMT group for adults with major depression resulting in improved levels of depression and anxiety as well as increased body awareness including connection to bodily sensations and emotions.

These studies suggest positive outcomes from a DMT intervention for depression; however, more research is needed within the field to further validate DMT as an effective treatment for various mental health diagnoses. “There is limited quantitative evidence that supports the effectiveness of D/MT with people with a diagnosis of depression. It is possible that D/MT offers added value over both exercise and dance classes in that it encompasses an embodied therapeutic relationship” (Mala et al., 2012, p. 289).

Unfortunately, I did not find quantitative or qualitative studies that included DMT combined with mindfulness or tai chi for psychiatric inpatient care. However, Barton’s (2011) qualitative study, Movement and Mindfulness, integrated DMT, yoga therapy, and eastern theories of mindfulness at a mental health outpatient rehabilitation facility. They found “the combination of dance/movement and yoga therapy offered participants opportunities to improve intrapersonal experiences and interpersonal relationships. The effects of this process included improved self-regulation, as well as improved awareness about personal control and stress reduction” (Barton, 2011, p. 178). My investigation considers if my DMT method combined with mindfulness practices and meditation could be a successful therapy for this acute inpatient population.

**Method**

This investigation addressed DMT as a new optional psychotherapy treatment within two inpatient units within the mood and anxiety disorders division. A total of 12 patients attended the groups; four males and eight females. All members were Caucasian, and ages ranged from 19 to
67. Their diagnoses included major depressive disorder, schizoaffective disorder, borderline personality disorder, and obsessive-compulsive disorder. Four of the 12 participants had attended this group prior to the investigation.

A total of four DMT groups were observed, three groups on the north unit, and one group on the south unit. Specific mental health diagnoses varied with the participating patients; however, the participants commonly shared symptoms of high anxiety, severe depression, and low self-esteem. As the participating observer of this method, my goal was to assess this DMT method as an effective alternative therapy within this hospital’s short-term treatment model. Goals of this method were to (1) reduce anxiety, (2) decrease depressed mood, and (3) connect physical sensations and body awareness to symptoms and emotions.

**Developing the Framework**

Before developing this method, I spent 3 months acclimating myself to the units by sitting in daily hospital rounds learning about each patient and treatment protocol. I observed various therapy groups including dialectical behavioral therapy, cognitive behavioral therapy, addictive behaviors, mental health stigma, self-esteem, and spirituality groups. In time, I started to co-lead these various groups beginning a therapeutic dialogue with the patients. I began to understand common symptoms of this population, often the result of trauma. Many shared symptoms included: suicidal ideation, self-harm, severe anxiety, social disengagement and isolation, severe depression, poor self-esteem, irritability, muscle tension, exhaustion, restlessness, obsessive compulsive behaviors, and rumination. With these severe symptoms in mind I created a group that could help the patients relax the mind and shift their focus by considering the whole body through breathing and movement. I wanted to create a space where patients could express their emotions through movement in a safe, relaxing, and active way.
Once I had an understanding of the severity of patient’s symptoms, I began to think of ways I could form a DMT group with safe and appropriate movement approaches that could meet their acute needs. Free movement of the body is a very vulnerable action. Throughout my clinical experience, I have learned that any practice that incorporates movement such as dancing, yoga, stretching, or acting, tend to be the most vulnerable and intimidating groups, yet, some of the most powerful and effective groups. With this experience in mind and acute status of the patients, I knew I needed to start with the fundamentals of the body. I asked for guidance from my supervisors about appropriate ways to incorporate movement with the patients. My first question in this process, “Where do I even start with the patients?” The answer I received from my wise dance/movement therapist supervisor Julie Leavitt was, “Well, I always start with the ground, the breath, and center” (J. Leavitt, personal communication, September 9, 2019). As she said this, she moved through each, by touching the ground with her feet, moving herself evenly in the chair with straight posture, taking a breath, and feeling the exhale by holding her core. The ground, breath, and center became the fundamental grounding technique I used with the patients to access movement.

I trained in dance techniques in jazz, tap, modern, and ballet for 25 years. For a decade living in NYC I explored my interest in dance recreationally in clubs, dancing various Latin techniques, swing dance, and to disco, house, and techno music. Here I became comfortable with myself dancing freely, unchoreographed, and with people from many cultural backgrounds. This helped shape my comfortability dancing with a diverse range of people, abilities, and styles. Most importantly, I became comfortable with improvisation and exploring my movement repertoire in a social context. Throughout the years I have also practiced yoga, Pilates, and briefly martial arts practices such as qigong and tai chi.
I considered the aspects of these practices and wanted this method to include emphasized breathwork, basic stretching, and easy standing movement phrases that were approachable to all ages and physical abilities. From my experience, tai chi was a technique that was relatively easy to pick up because of its slow, focused repetitive movements. I was curious to incorporate aspects of tai chi into my group. Tai chi focuses on the breath and balance while syncing slow fluid movement sequences. “As it comprises mental concentration, physical balance, muscle relaxation, and relaxed breathing, tai chi shows great potential for becoming widely integrated into the prevention and rehabilitation of a number of medical and psychological conditions” (Wang et al., 2014, p. 606). Based on my experience and research, this practice within a therapeutic framework puts mindfulness practice into action. Throughout the session I implemented DMT concepts of symbolism (Chaiklin & Schmais, 1979), through verbal directive metaphors to movement while creating a therapeutic movement relationship by connecting to each patient with eye contact and reflected expression. I created a group rhythm with the goal of achieving a group flow of moving transitions throughout my directive.

Introduction of Group Framework

The DMT group I created, called Mindful Movement, was an alternative to other group therapy options such as behavioral therapy and expressive art therapy groups that utilized other art modalities such as visual art, music, and drama. The group ran for 45-50 minutes in the same north and south therapy rooms each week. Each session was treated as a one-time session due to the nature of patient turnover within the units’ short-term treatment. The planned framework for each session included: introduction with greetings, group objectives, and group check-in (5 mins), tai chi inspired warm-up (10 mins), movement directive and theme development (15-18 mins), guided meditative body scan (10-12 mins), discussion (10-15 mins), and active closure (2
mins). As the first therapist to implement DMT within these two units, this format was carefully developed with close supervision to welcome the patients in a safe, organized, and objective therapeutic group.

My objective was to meet treatment goals by implementing stabilizing techniques to help the patients achieve a feeling of security and grounded connection to self, others, and hospital environment. Guided repetitive movement phrases, free movement, meditation, and discussion, were implemented to address a mind and body connection to mental health symptoms. This framework was used for every group however, the format and sequences were adjusted to meet the needs of each group. I created the playlist with a mix of minimal classical and contemporary instrumental music that was used consistently for each group. Other materials used for this group included pens, notepads, and a questionnaire. Before each session I cleared the group therapy room of excess chairs and tables creating an open dance studio space.

The introduction to each group included my personal introduction as the unit’s counseling intern and my specialization of study in DMT. Group confidentiality was disclosed to all participants informing them that I was observing the group for this method. Group objectives were explained emphasizing the group focus on physical and emotional connection. A description of the group format (i.e., tai chi inspired warm-up, free movement, and a guided meditative body scan) was also given. I emphasized that my guided meditation would focus on the physical sensations of different parts of the body for a closing progressive muscle relaxation. I explained that a goal was to relieve mental symptoms by focusing on the physical sensing part of self, connecting it to emotions experienced through the movement exercises. I asked the group to take note on how they were feeling at the beginning of the session so we could compare how
the group was feeling at the end of session (e. g., “I know that I am anxious right now and my shoulders are tight”).

To start this dialogue, I ask patients to introduce themselves, share how they were currently feeling, share where tension resided in the body (e.g., forehead, jaw, neck, shoulders, etc.) and lastly, share a physical activity they enjoy (e.g., walking, bike riding, martial arts, sports, dance, yoga, etc.). This assessment helped me to understand where they were emotionally, to understand how their bodies were feeling physically, and to have an understanding of their movement repertoire. I wanted to incorporate stretches and movement phrases that addressed each of their points of tension to develop sensory awareness and relaxation. Since each session is treated as a single session this person-centered approach helps establish quick individual rapport and a holistic understanding of the patient’s felt experience.

**Group Warm-Up**

The warm-up started in a standing circle to encourage group engagement. I encouraged everyone to spread their arms to create an arms distance length between each person, encouraging mindful use of space in relation to others. Group guidelines were disclosed stating a no touch policy, to only move in ways that feel good to prevent injury, and to sit down and take a break when needed. After finding a comfortable space, I emphasized sensing even weight on both feet by slightly bending the knees with a bounce to feel the body’s weight and connection to the floor. I then greeted everyone with eye contact and smiles and lead the group into deep breathing. While deep breathing I explained the first step to achieving a stable emotional and physical state is by noticing the breath and taking notice to the body’s physical state by taking deep breaths in through the nose and exhaling slowly through the mouth.
Trauma theorist Kirk van der Kolk (2014) emphasizes the first step in therapy is focusing on the body’s physical state by breathing. “In order to change, people need to become aware of their sensations and the way that their bodies interact with the world around them. Physical self-awareness is the first step in releasing the tyranny of the past” (p. 101). As I led everyone to a synchronized breathing, I emphasized a slow steady exhale and explained that on the exhale, the body’s nervous system naturally calms the heart rate, decreasing anxiety. I explained that we can take control of our bodies by focused breathing. I emphasized sensing the ground, the sensation of the breath, and the body’s core center where we can sense the movement of our breathing.

I continued synced breathing by adding a tai chi phrase that became a grounding breathing ritual for the groups. The sequence flowed with palms up moving to chest on the inhale and pressing palms down with a slow exhale. As I began to use this tai chi move in the beginning developmental stages of this group framework, I realized how effective it was to use this move to ground the group together to a synced focus. I realized I could always come back to this phrase to regulate the group if confusion, anxiety, or distraction developed. The warm-up continued with additional tai chi inspired phrases that included more focused hand and arm movements with the breath. The goal of starting the warm-up with these exercises was to bring the group to a focused standing posture to achieve a relaxed state for transitioning into deeper stretches. Stretches included each part of the body from the head down to the feet. After stretching I modeled shaking the body out encouraging everyone to shake out the tension that was just stretched. I then transitioned the group into the movement directive.

**Dance/Movement Therapy Directive and Group Theme Development**

Breaking out of the circle I guided the groups to simply walk around the room in any particular direction. Free movement may be very intimidating, so I used clear directions to help
the patients access movement. I encouraged walking around the space by noticing things in the room. While walking we moved our fingers, wrists, hands, forearms, and full arms, shoulders, knees, torso, hips. I guided the direction of movement (e.g., up, side, across, down), as well as encouraged light and strong efforts of movement while simultaneously moving the arms or legs. I challenged the patients to take up space by spreading their arms and legs wide by reaching out while walking. I encouraged them to take up the most amount of space by reaching and stretching. I would ask, “what is it like to just take up space in this room by reaching up or out or wide. With legs or arms or both?” I directed the patients to stop and face another direction by not facing anyone, and to shake, wiggle, or move the arms and legs freely, asking the group to explore what it feels like to move without looking at each other. I used the music playlist as a cue to transition the group back to a circle.

The movement directive continued, with each group developing in a unique and different way. My goal was to create a group rhythm to the music incorporating pulse movements, sway, twisting, expanding, contracting, and reaching movements. I continued to lead the group in movement phrases leading with descriptive metaphors and movement efforts of weight, flow, use of space, focus, and description of movement shapes. As the session progressed, I asked the participants to create a move that the group could reflect together. Each patient had the opportunity to lead. This request was the biggest challenge for the participants yet created a great opportunity for individual validation through group reflection and syncing together. It was also an opportunity for peer support and encouragement if someone didn’t think they could contribute individual moves.
Group Closure

This directive transitioned to a cool down meditative body scan. I asked the patients to find a seat in the room and guided them through a progressive muscle relaxation. I led the meditation by focusing on different body parts starting with the focus of the feet on the ground, working the focus up to the top of the head. I encouraged the focused breathing to each body part, asking the patients to sense each part by tensing the muscles and releasing the tension. After the meditation, I transitioned to a group discussion. Each participant was given a questionnaire of seven questions to reflect on or fill out. I informed the group that the questionnaire was for them to keep and would be used as a prompt for discussion. Questions included: “What was your experience? Where was your focus? How do you feel now compared to when you first walked into the room? What is your mood? How do you feel in your body physically and emotionally? Were you able to not critically think about moving? Was your mind able to relax? If you were not critically thinking or ruminating while moving, what was moving you? (e.g. The music? Others in the group? The movement? A feeling inside?).” Ten minutes were given for reflection. This was also an opportunity to quickly document my observations on a notepad. Additionally, I took notes during the group discussion documenting my observations of the patients’ experiences. I once again disclosed that my notes are confidential, and my reflection of the group experience. For closure I brought the group to a standing closing circle, closing with synced deep breathing with the repeated tai chi phrase (i.e., breathing while palms move up, exhaling palms pushing down).
Results

First Session

The first session started with four patients and ended with two patients who stayed for the full duration. The group included one male, J, in his early 20s, C in her mid 40s and S and H in their mid 50s. C and H had previously attended the group multiple times. It was first-time attendance for S and J who were only able to stay part of the session. This session flowed with the planned group framework and was a positive experience for H and C who finished the group and were able to express quite a bit of feedback. This was something to note as this was their second session with me. One patient said the group was a good distraction from their worries and that they felt calmer and emotionally at peace. One patient expressed that the group as a whole helped move her. Another patient focused on her center of gravity and through this was able to relax her muscles. She expressed feeling freer, relaxed, yet emotionally more energized. It was also said that the group was more comfortable to participate in because it was not a technique class or traditional dance class. It was less intimidating, and the patients felt less body conscious.

Second Session

Only one patient showed for the second session. The patient is 26 years old and this was his second time attending this group. The group framework was not followed and adjusted to the individual session. The patient expressed wanting to try meditation again in hopes of relieving some of his anxiety. He expressed that there was no particular area of tension in his body and was nervous to try moving with me. It was significant to note that he did not experience tension in his body different from my body assessment. His posture was held and curved, movements were slow, bound, and rigid and it appeared he was withholding tension throughout his body. I wanted to see if I could help him relax his muscles to find the connection to the held tension.
Warm-up did include breath work and tai chi phrases. I continued to lead the patient face to face by doing slow arm movements to deep breathing. This 1:1 session was an opportunity to assess this patient’s movement repertoire and ability in developing a movement dialogue. I focused on the movement relationship by syncing my breath to the patient’s as well as syncing my movements to the pace of the patient’s. After a 15-minute warm-up, we transitioned to a seated meditation. I guided the patient for about 25 mins through a progressive muscle relaxation. After this exercise we discussed his experience. He expressed that his mind was able to free associate. I asked if this was a good thing and if he could describe the imagery, but he was unsure. He appeared more relaxed compared to the beginning of the session. The patient had a difficult time articulating his mood and overall experience, however, expressed he felt more relaxed.

**Third Session**

Three patients attended this third session. T and R were in their mid 60s, and A was 19. The group framework was followed with adjusted timing due to group interruptions and different abilities. This was the first attendance for A and T. A and T expressed feeling anxious and R expressed feeling okay. Noted areas of tension were the shoulders, hands, and all over body tension. Group attendance and participation was inconsistent. T left for a treatment team meeting and later returned to finish the group. R sat down half-way expressing low energy however, with a few moments of stillness and focused interest in the group’s movements, stood up and rejoined the group. A consistently participated for the entire duration. T expressed feeling anxious at the beginning to feeling calm, reporting that it felt better than taking a Xanax. A reported feeling bored, agitated, and anxious ending with feeling calm. R overall felt good about the group. A and R appeared more relaxed when I turned my focus toward them. T closed his eyes a majority of the session dropping into his body taking my audio cues. Half-way through the
group A was the only participant and this was an opportunity to connect individually through free dance. The group ended as a whole with all three patients participating in the discussion and closure.

**Fourth Session**

This was first time group attendance for the four attending patients. Their ages ranged from 19-22. Symptoms observed included anxiety, depressed mood, agitation, and nervous excitement. The group framework was followed, and each patient stayed for the entire group. Each patient participated in the discussion and reported feeling less anxious. Each patient was able to articulate their mood before and after the group as well as identify their physical awareness of tension held at the beginning and tension released. I was very moved by one of the patients who is mainly mute and self-isolative whom participated the most in movement, easily taking my cues and leading the group with individual moves. A patient expressed feeling nostalgic while dancing, thinking it was going to be a technique class. She appreciated the space to explore free movement without judgment.

**Observations and Group Themes**

Nine out of 12 patients were able to participate and attend an entire session. A key theme I noticed across all groups was the connection to my guided warm-up. Each group was able to sync their breath together and focus during the tai chi inspired warm-up and group closure by participating in the same ritual movement sequences. Through the slow repetited phrases I found this aspect of the group to be consistent in following direction and effective to reduce anxiety.

I noticed patients held tension in commonly shared body parts (e.g., back of neck, shoulders, hands, lower back, and stomach). Self-message and self-hugs were well received gestures to relieve the tension. Patients commonly initiated movement from their hands and
forearms while it was more of a challenge to stand straight and move the lower body. I also found it difficult for the patients to raise their gaze from the floor to fellow group members and myself. I emphasized non-verbal group connection during the warm-ups by greeting each other with eyes and with smiles. Throughout the directive I emphasized use of space by directing them to notice other’s movements in relation to theirs.

Each group developed their own themes of rhythm. Rhythms included sway, pulse, twisting, lifting and pushing movements. Movements in the vertical plane such as lifting and reaching to the sky and pushing the arms down was a common theme that I emphasized to shift posture. This spinal articulation was emphasized by reaching high and expanding and stretching as well as playing with the opposition of rolling down over the body, letting the center of gravity fall to the floor. We played with the opposition of growing and breathing to dropping and exhaling, pushing out the tension into the ground by folding over our bodies. Contraction and release were themes (e.g., tense the shoulders up or clench hands on the inhale, exhale release muscles; open arms and chest to sky while looking up, then closing arms to a circle while contracting the back by curving down, bringing the belly button back while head follows downward). Leading individual movement in turns around the circle developed in sessions two and four (i.e., each participant shared a personal dance move or stretch that the group could reflect). Throughout each groups’ development I directed the patients to explore weight such as lightness to release tension, pulsating bounces to the beat, or moving fingers and hands to the beat, (e.g., twinkling fingers or expanding fingers to the beat).

Weather became a theme in session one and was incorporated into the group through symbolic dancing (e.g., the theme of moving lightly through the rain and mist, twinkling fingers became light raindrops as a syncopation to the music). The theme of moving lightly with soft
flowing arms translated in each session. There were moments of synchronicity in session four, when a patient started moving like a bird by flowing her arms out. I lit up and said, “was your movement inspired by the music? This song is titled, ‘Flocks’ like flocks of birds.” There were repeated themes of swaying side to side and twisting movements to the beat of the music. Swimming arms developed in each group and were a repeated movement sequence that a patient from each group mentioned a metaphor of swimming. Finally, the meditation theme of “ground, breath, center” was an affective guide for grounding the patients. Sitting up straight during meditation was also a challenge reversing their common slouched postures. However, including self-touch while meditating (e.g., touching the called parts of the body such as the arms, neck, and stomach, etc.) kept the patients engaged in an active resting posture.

Ending the group with the same focused tai chi sequence was grounding and calming for the patients to transition out of the group, keeping the sense of peace. I felt group synchronicity in these closing moments and most connected to each patient. Overall each group had successful outcomes and goals were met through each group’s unique development. Each patient reported feeling less anxious, relaxed, or calm at the end of each session. Patients appeared more engaged and tuned in to my closing facilitation through eye contact. Body postures seemed more relaxed, as if weight had been lifted. Patients reflected relaxed bodies yet more focused calm minds sounding less anxious when speaking. Final comments of the session included being able to let go of ruminating thoughts, feeling emotionally detached from symptoms, feeling more at peace with self, and feeling better all around. One patient expressed that they found themselves moving freely and unconsciously. In a sense Mindful Movement seemed to be a 45-minute escape where patients let go, shifted their focus, and moved through the depression for relief.
Discussion

The goals of this method were to (1) reduce anxiety, (2), decrease depressed mood, and (3) connect physical sensations and body awareness to emotions. *Mindful Movement* met the goal of reducing anxiety and promoted relaxation. All reporting patients expressed that both their mind and body were able to relax. The method was successful in meeting the patients holistically by approaching mental health symptoms with a connection to the physical self. Body awareness was established. In total, patients were able to identify a physical shift from the beginning of the session. Eight of the patient’s identified a lift in mood and identified what helped them move and relax, (e.g., guided meditation, the music, calm guided movements synced with the breath). This reinforced the works of Chaiklin and Schmais (1979), who state, “By understanding the inherent relationship between motility, dance, and emotional expression, the therapist helps the patient to move and be moved” (p. 17).

Starting the practice gradually with focused deep breathing established a grounded sense of the physical self to the present. This opened the opportunity to transition and expand into movement phrases. “In mindfulness practice, the focus of attention is usually an object of internal experience: sensory experiences of breathing, sensory experiences related to emotions, or other body sensations” (Hölzel et al., 2011, p. 541). Repetition and slow movement sequences helped the patients to self-regulate and calm their nervous systems. Throughout each groups’ progression, creativity emerged in different ways through metaphors, play, and exploratory movement. Capello (2009) emphasizes “the body in DMT as a vehicle for creative and expressive release,” and that “body movement is basic to life (p. 89). The opportunity to dance and move freely in therapy opens a door for new creative expression. Patients were able to try on new movements, describe movements, and some were able to lead new movements.
Mindful Movement had successful outcomes as a single session with eight out of 12 patients, however, the bond that was established with three of the four returning patients had the most successful results. Rapport was established with the three returning patients as they were significantly more comfortable moving, more focused, and more relaxed compared to their first sessions. Among these patients there was a significant shift in affect. Smiles, engaged eye contact, and motivation were noticeable. Discussion deepened and through group process it was apparent there was growth in personal insight.

The short-term unit treats a range of mental health disorders; however, the short-term unit lacks diversity within their patient population, lacking in racial diversity, socioeconomic status, and cultural backgrounds. Other challenges included an interruption from a treatment team in session four, two patients walked out in session one, and all groups were interrupted by 5-min safety checks. Only two sessions had full attendance for the entire duration without interruptions.

Session two had the most challenges. Unfortunately, attendance was limited to one patient who wanted to focus on meditation specific practice. I was unable to practice my group framework in full and was limited to observing only a method warm-up and guided meditation. This patient insecurely expressed being unsure of how to express himself in English and was challenged in understanding my questionnaire. Noting his cultural background and language challenges, my understanding of the session’s emotional impact of his overall experience was limited.

As reviewed earlier, numerous mindfulness studies have been extensively researched suggesting positive mental health outcomes (Hölzel et al., 2011; Niles et al., 2016; Surmitis et al., 2018; Van der Kolk, 2014; Wang et al., 2014). Limited DMT studies have been researched in inpatient settings, (Koch & Fuchs, 2007; Papadopoulos & Röhrich, 2014; Punkanen et al.,
2014), or with DMT combined with mindfulness practices (Barton, 2011). More empirical research is needed in the DMT field to further validate DMT in short-term inpatient settings. Specific empirical research of DMT combined with mindfulness practices like the *Mindful Movement* method would pose a more effective holistic treatment meeting one’s full body through a therapeutic movement relationship. Short-term inpatient care is time sensitive and treatment is optimized to stabilize patient symptoms as quickly as possible.

The implementation of this method suggests combining DMT with mindfulness practices as a single session as it promotes multiple movement practices with opportunity to reach acute needs in a time sensitive manner. Psychiatric inpatient care is not a cure-all. Mental health treatment is a continued life-long practice. It is my hope that DMT may grow, inspiring and reminding those with mental health struggles that moving is a basic human need, and that they may find a practice to continue moving through depression.
References


https://doi.org/10.1007/s10465-016-9220-6


Chaiklin, S. (2009). We dance from the moment our feet touch the earth. In S. Chaiklin & H. Wengrower (Eds.), *The art and science of dance/movement therapy: Life is dance* (pp. 3-11). New York: Routledge.


https://doi.org/10.3390/rel5041062

https://doi.org/10.1177/1745691611419671
dance intervention on psychiatric patients with depression. *The Arts in

Dance Association, an association of American Alliance for Health, Physical Education,
Recreation, and Dance.

Mala A., Karkou V., & Meekums, B. (2012). Dance/movement therapy (D/MT) for depression:
https://doi.org/10.1016/j.aip.2012.04.002

and Buddhism: Contributions of Buddhist philosophical and religious teachings to the
http://dx.doi.org/10.1177/0261429417716347

Feasibility, qualitative findings and satisfaction of a brief tai chi mind-body programme
https://doi.org/10.1136/bmjopen-2016-012464

Peper, E., Lin, I.-M., & Harvey, R. (2012). Increase or decrease depression: How body postures
https://doi.org/10.5298/1081-5937-45.2.03

Papadopoulos, N. L. R., & Röhrich, F. (2014). An investigation into the application and
processes of manualised group body psychotherapy for depressive disorder in a clinical

https://doi.org/10.1080/17432979.2013.847499


https://doi.org/10.1002/cvj.12069


https://doi.org/10.1007/s12529-013-9351-9


https://doi.org/10.1007/s10465-017-9241-9
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