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Is Dance/Movement Therapy an Effective Treatment for Depression in Students?

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A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

In Partial Fulfillment of the Requirements For

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In

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Department of Physician Assistant Studies
Philadelphia College of Osteopathic Medicine
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ABSTRACT

OBJECTIVE: The objective of this selective evidence-based medicine (EBM) review is to determine whether or not Dance/Movement Therapy (DMT) is an effective treatment for depression in students.

STUDY DESIGN: Systematic review of three published, randomized controlled trials (RCTs) between 2005 and 2013, all English language

DATA SOURCES: Three RCTs analyzing DMT use in depression were found using PubMed

OUTCOMES MEASURED: Decrease in depressive symptoms, measured by the Beck Depression Scale, a self-rated health questionnaire, and Symptom Check List-90-Revision (SCL-90-R)

RESULTS: DMT resulted in lessened depressive symptoms for students in all three RCTs. Jeong et al. observed a significant decrease ($p=0.001$) in depressive symptoms of the DMT group compared to the control group via an F-score analysis of anxiety and depression subscale scores of the SCL-90-R⁸. An unpaired t-test of post-intervention Beck Depression Scale scores in both the dance intervention and control groups of the Akandere and Demir study also demonstrated significant differences in scores ($p=0.004$), suggesting greater reduction of depressive symptoms in the dance intervention group⁹. Finally, Duberg et al. utilized an 88-question self-rated health questionnaire, revealing significant improvement ($p<0.05$) in depressive symptoms of the treatment group compared to the control group at 12 months from baseline with a calculated NNT of 3¹⁰.

CONCLUSIONS: All three studies demonstrated that DMT is an effective therapy treatment for depression in students. Incorporating DMT into the lives of middle school through university-aged students resulted in decreased depressive symptoms and ultimately improved quality of life. Given its versatile and variable nature, DMT can be utilized for many different kinds of patients as either an adjunctive therapy to currently practiced treatments or as monotherapy for mild depression.

KEY WORDS: dance, movement, depression, students

INTRODUCTION

The journey from childhood to adulthood is a complicated one to say the least; the simultaneous amalgamation of new and unfamiliar physical, emotional, and social changes often presents with mixed emotions. While later bedtimes, higher allowances, and more freedom bring about feelings of excitement and maturity, the countless new challenges that face adolescents and young adults (i.e. increasingly difficult academics, financial limitations, peer pressure, and unattainable society-imposed physical standards) may be accompanied by anxiety, self-doubt, and depression. Depression, or Major Depressive Disorder (MDD), is a mood disorder defined as daily depressed mood or loss of interest for at least two weeks causing significant distress or impairment and not related to substance use or another medical condition¹. Other symptoms of depression include, but are not limited to, sadness, indifference, apathy, insomnia/hypersomnia, weight loss/gain (5%/month), psychomotor agitation or retardation, fatigue or loss of energy, impaired concentration, indecisiveness, feelings of worthlessness, guilt or shame, and thoughts of death/dying¹. Left uncontrolled, depression can lead to a variety of acute and chronic emotional and physical ailments¹. This article reviews three randomized controlled trials (RCTs) assessing the efficacy of Dance/Movement Therapy (DMT) as treatment for depression in students.

Even with the large suspected number of cases going unreported each year, depression remains the most common mental health condition seen in non-mental health settings in the United States¹. Up to 30% of primary care patients report experiencing depressive symptoms², and it is estimated that 15% of the population will experience a major depressive episode (MDE) at some point in their lives¹. The average number of outpatient visits annually with a primary diagnosis of MDD is 8 million, and the average number of hospital discharges with MDD as the first listed diagnosis is 395,000³. During any given two week period, 8% of persons twelve years of age and older suffer from depression³, making it the leading cause of disability in the U.S. for ages 15-44⁴ and consequently causing an estimated \$55.1 billion loss of productivity per year¹.

Depression is twice as common in women as in men, and in both sexes, the incidence of the disease increases with age¹. In 2013, 6% of twelve to thirteen year old individuals reported experiencing a MDE within the previous year; that number was more than doubled (13.5%) in the population of sixteen to seventeen year olds⁵. Additionally, in 2014, one third of college students polled admitted to having difficulty functioning within the past twelve months due to depression⁶. The prevalence of MDD in adolescents and young adults in the U.S. is continuing to grow with time; in just three years (from 2010 to 2013), the average incidence of a MDE in teenagers twelve to seventeen years old had increased from 8% to 11%⁵.

Depressive illnesses are proven neurological disorders, and theories of neurotransmitter abnormalities in the brain are widely accepted among the scientific and medical communities; however, these theories have been difficult to verify⁷. The exact cause of depression remains unknown and is thought to involve a combination of genetic, biological, environmental, and psychological factors⁷. On MRI, areas of the brain associated with sleeping, eating, mood, thinking, and behavior appear differently in people with depression compared to people without, but this finding still fails to explain the presence of depression and cannot be used to diagnose the disease⁷. Not all forms of depression have genetic transmission, although some can be traced back through family lineage, and scientists have shown that the concordance rate of the disease in monozygotic twins is higher than that of dizygotic twins¹. Researchers are continuing to look for specific genes correlating to this disease⁷. Trauma and stressful events, such as losing a loved one, may also initiate a MDE, although episodes can occur with or without the presence of a trigger⁷.

Currently, standard treatment for depression involves psychotherapy, pharmacological interventions, or a combination of the two⁸. Medication is most effective for achieving remission and preventing relapse, but integrating psychotherapy, such as cognitive behavioral therapy or interpersonal therapy, improves outcomes by helping patients to cope with decreased self-esteem¹. Despite the vast number of medications available for use, no one drug has been identified as the

“drug of choice” due to variable side effects, drug interactions, and effectiveness between patients¹. Nonetheless, if administered in a sufficient dose for six to eight weeks, any chosen medication may improve depressive symptoms in 60-70% of patients¹. In refractory MDD, brain stimulation techniques, like electroconvulsive therapy, may be helpful⁷. Despite recent attempts to increase mental health awareness, many people with MDD never seek treatment and others still do not recognize depression as a disease⁷. These challenges, paired with patient noncompliance and continued lack of etiologic understanding, make treatment of the disease complex and frustrating.

Due to the multifaceted nature of the above therapies, further research is being conducted to search for effective nonpharmacological therapy that can be used as either monotherapy or adjunctive therapy; one such intervention being considered is Dance/Movement Therapy (DMT)⁸. Exercise is already accepted as an effective adjunctive therapy for MDD, and as a form of exercise, dance may also prove to be a useful intervention⁸. Research suggests that the combination of music, light, exercise, and sensory stimulation observed in DMT generates introspection in patients that produces both subjective and objective improvements, such as alleviating physical tension, anxiety, or aggression; reinforcing and enhancing positive body image; improving the capacity for communication, happiness, pleasure, and spontaneity; lessening “cognitive and kinesthetic disorientation”; and supporting therapeutic medical objectives⁸. For centuries, dance, among other forms of rhythmic movement, has been used to “enhance expression” and “modify emotions,” and since the early 1950’s, the Western world has utilized DMT as a form of art therapy to aid in the physical and psychological recovery of patients with diseases, such as heart disease, neurological impairment, cancer, AIDS, and chronic pain⁸. Only recently has research started to focus on the use of DMT in depression⁸.

OBJECTIVE

The objective of this selective EBM review is to determine whether or not dance movement therapy is an effective treatment for depression in students.

METHODS

The studies included in this review are three randomized controlled trials (RCTs). The populations studied consist of currently enrolled, healthy male and female primary school and university students aged 13 to 24 years with either previously diagnosed depression or recurrent depressive symptoms. The intervention in all three RCTs was DMT, although the specific type of dance used and the amount of time spent in DMT per week varied across studies. Comparisons were made between DMT treatment groups and control groups; students in the control groups had the same demographics and entrance criteria as the DMT group but did not participate in DMT. Comparisons were made between pre- and post-treatment questionnaires. Outcomes measured included reduction in depressive symptoms and ultimately improved quality of life.

Key words used in the search included “dance”, “movement”, and “depression.” All articles chosen were published in English between 2005 and 2013. The articles were found via the PubMed database. Cochrane Systematic Reviews was also searched to rule out any previous systematic reviews on the topic. Articles were selected based on date published, relevance to topic, and importance to patient-oriented outcomes (POEMs: Patient-Oriented Evidence that Matters). Inclusion criteria consisted of randomized controlled trials published within the past fifteen years in peer-reviewed journals that involved students enrolled at the time of the study with either a diagnosis of depression or repetitive depressive symptoms. Exclusion criteria included articles published greater than fifteen years ago. Summary of statistics reported includes p-value, F-score, RBI, ABI, NNT, and unpaired t-test. Table 1 displays the demographics of each included study.

Table 1. Demographics of included studies.

| Study | Type | # of Pts | Age (yrs) | Inclusion Criteria | Exclusion Criteria | W/D | Interventions |
|------------------------------|------|----------|----------------|---|--|-----|---|
| Jeong ⁸ (2005) | RCT | 40 | Mean age of 16 | -healthy middle school-aged females with a confirmed diagnosis of depression -parental permission to participate | -past or present diagnosis of psychiatric or internal illness -neuroendocrine disorders -history of regular exercise within the past 6 | 0 | 45 minutes of DMT 3 times/week for 12 weeks |

| | | | | | | | |
|---------------------------------|-----|-----|-------|--|---|----|--|
| | | | | | months -using prescription medications or any other therapeutic treatment for depression -habitual smoking or drinking | | |
| Akandere ⁹ (2011) | RCT | 120 | 20-24 | -healthy male or female conservatory students -individually engaged in 8-10 hrs of exercise weekly prior to study | -medical or orthopedic problems that would compromise subject's participation | 0 | 110 minutes of a dance training program 3 days/week for 12 weeks |
| Duberg ¹⁰ (2013) | RCT | 112 | 13-18 | -girls 13-18 y/o with internalizing problems who had recurrent visits to the school nurse for psychomatic symptoms such as pain in the head, stomach, neck, back and/or shoulder and for persistent feelings of tiredness, being worried, and being in low spirits | -severe hearing impairment -intellectual disability -difficulties with the Swedish language -Child and Adolescent Psychiatric Care advised against participation | 11 | 75 minutes of dance intervention 2 times/week for 8 months |

OUTCOMES MEASURED

The outcomes measured in all three studies were decrease in depressive symptoms and, subsequently, an increase in the quality of life of the students. These were obtained using patient-completed depressive questionnaires, which were filled out both pre- and post-DMT intervention. Jeong et al. had participants complete the Symptom Check List-90-Revision (SCL-90-R), a self-report inventory of emotional distress, before beginning DMT and at the end of the twelve-week period⁸. The SCL-90-R contains many subscales including depression (DEP) and anxiety (ANX) scores⁸. The Akandere and Demir study followed the same protocol but with the Beck Depression Scale to evaluate participant outcomes⁹. The Beck Depression Scale categorizes participants' level of depression into one of four classifications based on their test score: normal depression, 0-9; low level depression, 10-15; medium level depression, 16-23; and depressive, ≥ 24 ⁹. Finally, Duberg et al. had participants fill out a customized self-rated health (SRH) questionnaire before and after eight months of DMT intervention; the questionnaire included 88 questions pertaining to emotional distress, psychomatic symptoms, depression, sleep, school, interests, friends, leisure

time, and student enjoyment of dance¹⁰. Each question was scored on a scale from 1 to 5, 1 being “very poor” and 5 being “very good”. For purposes of analyzing dichotomous data, a score of 3 or less was considered “depressive” and a score of 4 or higher was “not depressive”.

RESULTS

Three RCTs evaluated the efficacy of DMT in reducing depressive symptoms and subsequently improving quality of life of students presenting with mild depression or symptoms of depression. Two studies involved primary school aged female students while the other looked at university aged female and male students. In all three trials, the experimental groups were compared to control groups comprised of students with the same symptoms who did not partake in DMT. All participants were selected based on the inclusion criteria found in Table 1. Trials were executed with an intention-to-treat analysis of data. Efficacy was the primary effect observed for all three RCTs was reported as continuous data; only the Duberg et al. data was converted to dichotomous format and evaluated for numbers-needed-to-treat (NNT)¹⁰. No significant differences were noted between demographic characteristics of the DMT and control groups for each study, and no adverse events were reported. Significant data is reported with p-value ≤ 0.05 .

In the RCT by Jeong et al.⁸, forty female middle school seniors were randomly selected from a pool of fifty-one female volunteers, all testing high for positive depressive symptoms. Those forty students were then randomly and blindly divided into treatment group (n=20) and control group (n=20). Treatment group subjects participated in a 12-week DMT program, which required students to take part in 45-minute DMT sessions 3 times per week. All sessions were focused around the four major themes of: “(1) awareness of the body, the room, and the group; (2) movement expression and symbolic quality of movement; (3) movement, feeling, images, and words; and (4) differentiation and integration of feelings,”⁸. Subthemes of the each of the four major themes included: “(a) setting limits and outer, inner, and personal space; (b) body language, the reflecting process, polarity and inward and outward expression; (c) playing, drawing, and

verbalization; and (d) the inner sense, quality of movement and expression of feelings.”⁸. Students in the control group did not participate. Females were exclusively recruited, as depression is twice as common in females and recurs as often as 50-90% of the time⁸. This study obtained 100% compliance, as all forty participants completed the trial in its entirety, and all students whose data were collected was analyzed in the group to which they were originally assigned.

Primary outcome of depressive symptoms was gathered and evaluated via the SCL-90-R. Over the 12-week treatment period, a significant decrease was observed in depressive symptoms of the treatment group, while no significant change was seen in the control group. An F-score analysis of the SCL-90-R subscale scores DEP and ANX were calculated and revealed that a significant difference was present between the DMT and control group over course of the study [$F(1,92) = 68.1$; $p = 0.001$, and $F(1,92) = 57.6$; $p = 0.001$, respectively]. The DMT treatment group showed a significant reduction of depressive symptoms versus the control group (Table 2).

Table 2: SCL-90-R Pre & Post Test Subscale Score Comparison of DMT & Control Groups

| | | <i>Pre</i> | <i>Post</i> | <i>F(1,92)</i> | <i>p-value</i> |
|------------|-----------------------|------------|-------------|----------------|----------------|
| DEP | <i>DMT (n=20)</i> | 51.8 | 46.4 | 68.1 | 0.001 |
| | <i>Control (n=20)</i> | 43.6 | 46.1 | | |
| ANX | <i>DMT (n=20)</i> | 51.2 | 45.3 | 57.6 | 0.001 |
| | <i>Control (n=20)</i> | 45.0 | 47.8 | | |

The Akandere and Demir⁹ trial recruited 120 male and female conservatory students aged 20 to 24 years who volunteered to participate in a 12-week dance training program consisting of 3 sessions of 110 minute dance training per week. Students with orthopedic injuries or medical illnesses were excluded as to not cause further harm or compromise participation. Subjects completed Beck Depression Scale questionnaires both before and after the 12-week program, and those scores were evaluated. Students were randomly divided into two groups, the control group (n=60) or the DMT group (n=60), and each group contained equal numbers of male (n=30) and female participants (n=30). Students in the treatment group attended DMT sessions in addition to their normal academic classes. Each DMT session was broken down into 10 minutes of warm up,

90 minutes of dance exercise (Rumba or Vals), and 10 minutes of cooling. Subjects in the control group did not participate in the training, only the pre- and post-test measurements, and continued their academic program as usual. All students were instructed to abstain from physical activity not related to the trial during the testing period and to maintain their usual dietary habits. The study obtained 100% compliance, as all participants completed the trial in its entirety, and all students whose data were collected was analyzed in the group to which they were originally assigned.

Paired t-tests compared depressive scores pre- and post-intervention and showed significant improvement in symptoms of the DMT group over the 12 weeks ($t=5.627, p=0.000$); scores improved from “low depression” to “normal depression.” No significant change was noted in the control group over the same time ($t=0.764, p=0.448$)(Table 3). A significant difference was also observed between the DMT and control group scores post-intervention via an unpaired t-test ($t=2.911, p=0.004$), showing significant reduction in depressive symptoms of the treatment group (Table 4). Standard deviations are presented in Table 4.

Table 3: Pre & Post Test Beck Depression Score Comparison in Dance Training Group & Control Group

| | | \bar{x} | <i>SD</i> | <i>t-score</i> | <i>p-value</i> |
|--------------------------------------|-------------|-----------|-----------|----------------|----------------|
| Dance Training Group (n = 60) | <i>Pre</i> | 15.72 | 7.004 | 5.627 | 0.000 |
| | <i>Post</i> | 13.90 | 5.568 | | |
| Control Group (n = 60) | <i>Pre</i> | 16.53 | 5.922 | 0.764 | 0.448 |
| | <i>Post</i> | 17.48 | 7.740 | | |

Table 4: Dance Training Group vs Control Group: Comparison of Post Test Depression Scores

| | \bar{x} | <i>SD</i> | <i>t-score</i> | <i>p-value</i> |
|--------------------------------------|-----------|-----------|----------------|----------------|
| Dance Training Group (n = 60) | 13.90 | 5.568 | 2.911 | 0.004 |
| Control Group (n = 60) | 17.48 | 7.740 | | |

Lastly, in the Duberg et al.¹⁰ RCT, 112 female students aged 13 to 18 years old were selected by the school nurse to participate in 8 months of DMT. Selected students were assigned to either the DMT group (n=59) or control group (n=53) by a third-party statistician via blind randomization of sealed envelopes. Over the 8 months, subjects assigned to the DMT group

participated in 75 minute sessions of dance instruction twice per week, which involved 15 minutes of warm up, 40 minutes of moderate to vigorous African, jazz or contemporary dance activity, 15 minutes of stretching, light massage in pairs and relaxation, and 5 minutes of reflection. If the girls had any internalizing problems, they were not addressed during these sessions. Each student was given the permitted to choreograph a routine and move spontaneously in hopes that they would experience their body in a positive way. Students in the control group did not receive dance intervention and were instructed to go about daily life as usual. A compliance rate of 81% was noted in the dance intervention group after 11 students withdrew. Forty-eight total classes were offered, and 6 students (13%) were present at > 89% of classes, 26 girls (54%) attended 50-89%, and 16 girls (33%) attended 10-49%. At the end of the 8 weeks, 43 students (91%) rated the experience as positive, 3 girls (6%) rated it neutral, and 1 girl (2%) rated it a negative experience.

The intervention was considered statistically significant with p-values < 0.05 and 95% confidence intervals of 0.54 to 1.10 at 12 months after baseline. The results showed NNT of 3, suggesting that for every three students participating in dance therapy, one additional student will have a decrease in her depressive symptoms and an increase in her quality of life as compared to control. The calculated absolute benefit increase (ABI) of 0.38 proposes that students in the dance intervention group had a 38% increase in relief of depressive symptoms, and the relative benefit increase (RBI) of 5.4 suggests that the participants in the dance intervention group had a 540% better chance of witnessing an improvement in their depressive symptoms than the subjects in the control group. Overall this data showed a significant decrease in depressive symptoms of students with dance intervention.

DISCUSSION

As validated by the results above, the research presented in this review suggests that dance has positive effects over depression and that DMT is a successful means of reducing depressive symptoms in the student participants, ultimately improving their quality of life. Dance-movement

therapy has already been proven to have positive outcomes when aiding in treatment for physical trauma, cancer, “nervous breakdowns”, chronic pain, heart disease, and post-surgical pain, as well as been observed to lower anxiety and perceived stress in college students⁹. Due to its introspective nature and positive effects on self-concept and psychological well-being⁹, DMT is able to provide depressed students with an enjoyable medium for self-growth, expression, and socialization in the absence of usual associated pressures of school¹⁰. Given these findings, it is reasonable to propose that clinicians use DMT as either a primary treatment for mild depression or an adjunctive treatment to traditional pharmaco- and psychotherapy for depression of students.

After reviewing the methods of each trial, a few limitations are worth mentioning. Firstly, although inherently difficult with this type of intervention, participant blinding was absent in all trials. Also, as all studies acquired participants on a volunteer basis, there is a risk for bias in favor of the DMT arm; students who participated may have had previous interest or experience in dance. Akandere and Demir in particular looked specifically at conservatory students, all of whom were already involved in some form of movement-oriented classes⁹. This was also the only study that included men; the other two articles excluded men on the basis that depression rates are twice as high among adolescent females as males^{8,10}. In addition, the Jeong et al. study had a small sample size compared to the other two studies (Table 1), which may have skewed results⁸.

None of the trials involved equivalent exercise control groups, which may have aided in determining if students benefit from physical activity in general or specifically DMT. The control group in the Akandere and Demir study was instructed to refrain from all other physical activity during the time of the trial; this may have resulted in data exhibiting a more significant benefit of therapy in the DMT group than would have occurred if the control group was engaging in some form of non-dance related exercise at the same time⁹. Finally, in the Duberg et al. trial, baseline scores were lower in the DMT group versus the control group, and lower scores generally improve

more than higher scores causing the treatment to be overestimated by looking at the change in scores¹⁰.

Though no contraindications to DMT were identified, its use may be limited in the U.S. where insurance largely dictates accessibility to such therapies. As these studies were conducted in Turkey⁹, South Korea⁸, and Sweden¹⁰, insurance coverage did not play a significant role. Even though DMT has become more accessible due to an increasing number of certified DMT therapists in the work force, outpatient DMT sessions are rarely covered and can vary widely in price¹¹. However, as more people are diagnosed with depression and growing amounts of research support the benefits of DMT, insurances may need to reconsider current policies and expand coverage.

CONCLUSION

The results of this review demonstrate that the practice of DMT is an effective treatment for depression in students. All three studies reviewed in this article observed decreases in depressive symptoms and subsequently an improvement in quality of life in the students involved in DMT. The treatment of depression is widely accepted as complex and variable, and an abundance of treatment modalities are currently available⁸. The versatile and variable nature of DMT makes it an excellent option for adjunctive therapy to treatments that are already practiced or as monotherapy for mild depression since it can be tailored to the needs of individual patients.

Current research has illustrated the promising nature of DMT in depression, warranting further investigation of this treatment modality. Future research would benefit from exploring intervention in larger patient populations, greater numbers of male subjects, and more severe cases of depression. Studying the use of DMT in not only the treatment but also the prevention of depression could also provide additional insight. Lastly, it would be helpful to examine the effects of DMT when compared to an equally physically active control group or non-dance, art-related control groups (art, music, meditation, etc.) to examine if it is simply the physical aspect of dance that results in observed benefits or if another characteristic of DMT dictates its effectiveness.

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