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Official title of the study: Study Protocol for a Randomised Controlled Trial of Dance-Movement Therapy for Adolescents with Depression

Date of the document: 6th December 2025

Registration details: This study is registrated at ClinicalTrials, identifier HUS 391/2021. NCT ID not yet assigned

# Study Protocol for a Randomised Controlled Trial of Dance-Movement Therapy for Adolescents with Depression

## Background

Dance-movement Therapy (DMT) is a promising treatment for depression among adult patients. A systematic review and meta-analysis of eight studies included 351 patients with depression, of whom 192 received DMT combined with treatment as usual (TAU) and 159 received TAU only. All studies showed a decrease in the severity of depression. One study in the meta-analysis reported moderate depression symptoms decreasing to minimal symptoms. The effect size of DMT was 0.64 compared to control groups. The meta-analysis concluded that DMT is a beneficial intervention in the treatment of depression. However, only one study in the review included young patients, indicating a need for future studies, especially targeting this population. (1)

Research on Dance Movement Therapy (DMT) in the treatment of adolescent depression is limited. A Korean trial assessed the effectiveness of DMT for mild depression in young patients, with a mean age of 16 years. Patients were randomized to either a DMT group or a waiting list control group, with 20 patients in each group. In the DMT group, depressive symptoms decreased compared to the control group. Additionally, participants in the DMT group showed an increase in plasma serotonin concentration and a decrease in dopamine concentration compared to the control group (2)

In Finland, clinical trials of Dance Movement Therapy (DMT) for depression have included only adult patients. A randomized multicenter study included 109 patients with depression from psychiatric outpatient clinics, occupational healthcare, and health centers. Participants were randomized into groups receiving DMT combined with treatment as usual (TAU) and TAU only. Depression symptoms were measured using the Beck Depression Inventory-21 (BDI-21), Clinical Outcomes in Routine Evaluation-Outcome Measure (CORE-OM), and Symptom Checklist-90 (SCL-90) questionnaires. A clinically significant decrease in depression symptom scores was observed in the DMT group compared with the control group. (3)

## Aim of the study and hypotheses

The aim of this clinical trial is to investigate the effectiveness of a group-based dance-movement therapy in treating depression among adolescents. We tailored a group-based DMT treatment for adolescents based on knowledge from the multi-center study (3) of adults.

Research questions are as follows:

1. Is dance movement therapy (DMT) effective in the treatment of adolescent depression?
2. Does the effectiveness of DMT persist for a 3-month follow-up period?
3. Are there clinical or background moderators that affect the treatment outcome?
4. What type of body image is observed in adolescents with depression, and does this body image change during dance movement therapy (DMT)

Hypotheses related to the research questions are as follows:

1. Dance Movement Therapy (DMT) combined with treatment as usual (TAU) is more effective in treating adolescent depression compared with TAU alone.
2. Treatment gains from active DMT persist until the 3-month follow-up.
3. The severity and recurrence of depression and comorbid psychiatric disorders predict poorer outcomes for DMT.
4. The body image of adolescents with depression is negative and will change to a more positive perception during DMT.

## Methods

### Participants and recruitment

The aim is to recruit 140 adolescent patients with depression into the study. Recruitment began at Helsinki University Hospital's adolescent outpatient unit in September 2022 (specialist level, Tier 3). Since September 2024, recruitment has been expanded to adolescent mental health services in Helsinki (targeted level, Tier 2).

Patients' ages range from 13 to 17 years. A clinical diagnosis of moderate or severe depressive disorder (ICD-10 codes F32.1x, F32.2, F33.1x, F33.2) is present, and comorbid illnesses may also be present. The requirement for the K-SADS-PL interview is that 4 or more depression symptom criteria must be fulfilled (22). The K-SADS-PL interview is widely used at the specialist level; therefore, not all participants have been assessed with it.

Exclusion criteria include primary psychotic disorders, personality disorders, severe eating disorders, or substance use disorders requiring treatment. Patients receiving long-term psychotherapy administered by a psychotherapist are excluded; however, those receiving brief therapy (7-12 sessions) administered by a psychiatric nurse or psychologist are eligible. Patients receiving psychophysiological physiotherapy are also excluded, as the treatment outcome could be confounded by another body-oriented therapy.

Patients meeting the inclusion criteria and their caregivers are informed about DMT and the trial during routine visits at the outpatient clinic. Those wishing to participate are screened and are required to sign written informed consent. Participants are randomly allocated into either the intervention or control group, stratified by age and sex.

Participants are divided into two age categories, with separate DMT groups for those aged 13-15 years and 16-17 years, to ensure developmental consistency within groups. Randomization is conducted by a research nurse through drawing lots once two patients have been recruited from the same age and sex category. It may take time to randomize and assemble a group of five to six participants. There is no masking for the researcher or the staff responsible for gathering measurements.

The intervention group (DMT+TAU) will participate in the DMT group in addition to receiving treatment as usual (TAU). The control group will receive TAU.

## Intervention: Dance-movement therapy group

The dance-movement therapy (DMT) intervention group is led by a dance-movement therapist, accompanied by an assistant leader and staff from adolescent mental health services, such as a nurse, psychologist, medical doctor, or occupational therapist, since autumn 2023. Each group consists of 5 to 6 patients.

Before the dance movement therapy (DMT) group begins, each participant will meet individually with the therapist to facilitate understanding of special needs and expectations. The purpose of this interview is also to share information and rules of the group therapy and to assess participants' body image. Additionally, the importance of attending each session will be emphasized by the therapist.

DMT group sessions are conducted once a week for 12 weeks, with each session lasting 75 minutes. Sessions are held in the physical education room of the psychiatric hospital.

DMT therapists are professional health care or social workers who possess qualifications as dance-movement therapists. All therapists have experience in mental health work and youth engagement. Additional training in group-form dance movement therapy for the treatment of depression has been completed by the therapists. Prior to initiating the DMT groups, the therapists underwent training for a specially tailored intervention specific to this study. The training aimed to ensure consistency and quality of the therapeutic intervention across all groups. Therapists were instructed in group therapy methods appropriate for this patient population, based on knowledge acquired from previous studies. The training was conducted by a PhD psychologist and DMT therapist (PP), and a physiotherapist, DMT therapist, and supervisor (ML).

Therapists participate in a supervision hour four times during the 12-week therapy period under the guidance of a supervisor. A report is written by the therapist for each patient after the completion of therapy, which can be considered in planning further patient care.

The goal of this dance movement therapy (DMT) intervention is to examine participants' relationships with their own bodies and movement in a safe, nonjudgmental atmosphere. Participants learn to observe their physical reactions, thoughts, and emotions. The aim is to strengthen a kind, curious, safe, and positive relationship with their own bodies, with attention to bodily activity and individual needs. Attendees learn various methods to modulate their feelings through embodied and movement-based techniques by engaging in mindful and communication-related physical exercises. The experiences of these exercises are communicated through discussion, drawing, and writing. The foundational principles of the group include trustworthiness, nonjudgmental attitudes, avoidance of harm (to oneself or others), and appreciation of embodied experiences. Each session begins with a warm-up exercise, followed by movement explorations within a specific theme that includes psychoeducation, and concludes with sharing experiences. Materials used in DMT include mattresses, balls, scarves, blankets, and beanbags. The schedule and themes of each session are described in Table 3. Suitable exercises for each group are selected by the therapist, who actively demonstrates the exercises with the group.

## Control group: Treatment as usual

Members of the control group continue their treatment in the psychiatric outpatient clinic as previously planned. Most participants in the control group attend weekly visits to the clinic, which consist of psychoeducation, brief cognitive behavioral therapy, family counseling, or non-directive supportive care according to individual treatment plans. Medication is expected for many participants. Additionally, a few participants are on the waiting list for special therapy or rehabilitation and do not have regular clinic visits. Details of the treatment modalities and frequencies are being collected and will be described in future research reports.

## Measures

Inclusion criteria include a clinical diagnosis of depressive disorder and a total score of 16 or more on the Beck Depression Inventory (BDI-21). The BDI-21 consists of 21 questions, with each question scored from 0 to 3 points, resulting in a total possible score of 0 to 63 points. Higher total scores on the scale indicate more severe depressive symptoms.

## Primary outcome measures

The severity of depressive symptoms among participants will be assessed primarily using the Beck Depression Inventory-II (BDI-II) and the Young Person's Clinical Outcomes in Routine Evaluation (YP-CORE) questionnaires. The YP-CORE includes 10 questions, each scored from 0 to 4 points, with a total score range of 0 to 40 points. A higher total score on the scale indicates more severe psychological distress. The scale is specifically designed for monitoring changes in psychological distress.

Primary outcome measures will be assessed at baseline and at 8 weeks, 12 weeks, and 6 months from baseline. Both measures have been translated into Finnish, validated, and used in previous studies.

## Secondary outcome measures

The Adolescent Depression Rating Scale (ADRS) interview will be used as a secondary outcome measure. The ADRS interview consists of 10 questions, each scored from 0 to 6 points, for a total of 0 to 60 points. A higher total score indicates more severe depressive symptoms and impaired agency. The ADRS interview will be conducted by clinical staff or a researcher who is unmasked to the treatment allocation.

The body image of the participants will be assessed using the Body Image Scale, a seven-point Likert scale consisting of 11 statements, such as "I feel comfortable in my body." The Body Image Likert statements were developed from the Body Image Assessment Interview in a DMT study on depression. This measure has primarily been used with adults. It is offered to the youth in this study because it is concise and is proposed to consist of four factors: 1) memories of suffering, 2) ignorance of body sensations, 3) using the body for safe self-regulation, and 4) relating to one’s body in a comfortable way.

Secondary outcome measures will be assessed at baseline, 12 weeks, and 6 months from the baseline (beginning of the intervention).

## Moderators

Data are collected from patient records during the treatment period according to health register information systems and notes from psychiatric clinics. The onset, duration, and recurrence of depression were obtained from K-SADS-PL interviews or clinical records. Additionally, information about other measurement tools, psychiatric medication, living conditions, and education will be gathered. Living conditions are categorized as living with both parents, living with one parent, or other, which includes all other alternatives. Patient education is categorized as attainment of expected education or assignment to special support or a small group. No register information was available regarding the education of parents or their socioeconomic class.

## Sample size and power calculations

The appropriate sample size of 140 patients was determined by power calculation. It was estimated that the difference between the intervention and control groups using the specified measures is approximately 0.5 SD. With the test power set at 0.8 and a significance level of 0.05, calculations indicated that 64 participants would be needed for each group. If the treatment outcome by categorical variable is estimated to emerge in approximately 35% of the controls and 60% of the DMT group, 62 participants would be required for each group. Considering an expected 10% dropout rate, the target sample size should be 140.

## Statistical analysis

The intention-to-treat (ITT) sample will include all patients who have provided consent and are randomized. The per-protocol sample will include all patients from the control group and those from the DMT group who attended at least seven DMT group sessions. No more than 20% of missing items per scale are allowed and will be replaced by the mean value of the scores. Appropriate imputation methods will be selected for other missing data.

The primary outcomes are the time-by-treatment interactions in linear regression models with the intention-to-treat and per-protocol samples at the end of the intervention and at follow-up, measured by the Beck Depression Inventory-21 and the Young Person's Clinical Outcomes in Routine Evaluation. Effect sizes of the differences in symptom scores within and between groups will be measured. The statistical significance level will be set at a p-value of $<0.05$, and 95% confidence intervals will be calculated.

## References:

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