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Effect of Art Therapy on Cognitive and Hand Functions of Alzheimer's Patients

Study Protocol

1. Introduction

This study aims to evaluate the effects of art therapy on cognitive and hand functions in patients diagnosed with mild to moderate Alzheimer's disease. Alzheimer's disease is a progressive neurodegenerative disorder characterized by decline in memory, attention, executive functions, and daily living activities. Art therapy, involving visual and creative activities such as painting, collage, and clay modeling, may contribute to cognitive stimulation, fine motor skills, and neuroplasticity.

2. Objectives

Primary Objective: To investigate the effect of art therapy on cognitive functions in Alzheimer's patients.

Secondary Objective: To examine the effect of art therapy on hand functions and fine motor skills.

3. Study Design

This is a randomized controlled trial (RCT). Participants will be randomly assigned to either an intervention group (art therapy) or a control group (no intervention). The study duration is 8 weeks, with sessions held twice weekly, each lasting 60 minutes.

4. Participants

Inclusion Criteria:

- Being 60 years of age or older
- Having a diagnosis of mild or moderate Alzheimer's disease
- Possessing the physical and cognitive capacity to participate in art therapy interventions
- Providing informed consent

Exclusion Criteria:

- Being in the severe stage of Alzheimer's disease
- Having a history of severe psychiatric disorders such as schizophrenia or major depression
- Having a physical disability that prevents the use of the upper extremities
- Being unable to participate in the intervention due to visual or hearing impairments

5. Sample Size and Randomization

Sample size calculation was performed using G*Power 3.1. Assuming an effect size of 0.5, $\alpha = 0.05$, and power $(1-\beta) = 0.80$, a total of 44 participants (22 per group) are required. To account for potential dropouts, the target sample size is 50. Randomization will be conducted using a computer-generated sequence with allocation concealment via sealed envelopes.

6. Intervention

The intervention group will receive art therapy sessions over 8 weeks, twice weekly, each lasting 60 minutes. The program includes mandala coloring (weeks 1–2), collage making (weeks 3–4), clay modeling (weeks 5–6), free drawing/painting (week 7), and a participant's choice activity (week 8). The control group will not receive any intervention.

7. Outcome Measures

- Mini-Mental State Examination (MMSE): to assess global cognitive function
- Surface Electromyography (sEMG): to measure forearm muscle activity during hand tasks
- Nine-Hole Peg Test (NHPT): to evaluate fine motor skills and hand dexterity

8. Data Collection

Assessments will be conducted at baseline (pre-test) and after the 8-week intervention (post-test). All evaluations will be performed by blinded assessors.

9. Statistical Analysis

Data will be analyzed using IBM SPSS Statistics 22. Descriptive statistics (mean, standard deviation, frequency, percentage) will be used to summarize demographic and clinical data. Normality of distribution will be tested using the Shapiro-Wilk test. For within-group comparisons (pre- and post-intervention), paired t-tests (parametric) or Wilcoxon signed-rank tests (non-parametric) will be used. For between-group comparisons, independent samples t-tests (parametric) or Mann–Whitney U tests (non-parametric) will be applied. Effect sizes (Cohen's d or r) will be calculated to assess the magnitude of changes. Statistical significance will be set at $p < 0.05$.

10. Ethics

The study protocol has been reviewed and approved by the Fenerbahçe University Non-Interventional Clinical Research Ethics Committee. Written informed consent will be obtained from all participants or their legal guardians.