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The effectiveness of art therapy on depression in Parkinson's disease

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Summary

Background: *Assessing the impact of art therapy on levels of depression in Parkinson's disease (PD).*

Subjects and methods: *The study included two groups of 30 patients with PD. After randomization, the study group, in addition to drug therapy, participated in cycles of art therapy (visual and graphic expression and music therapy) every three months for one year, while the control group remained exclusively on drug therapy. All participants were continuously evaluated by asking them to complete a validated questionnaire (Beck Depression Inventory Test II).*

Results: *A clear trend of mood improvement over time was observed in the study group, while in the control group, the proportion of subjects with a normal mood decreased, and the proportion with moderate to severe depression remained approximately the same. Furthermore, in the study group, depression scores were highest before therapy and lowest after completing the workshop cycle, while in the control group there was a statistically significant increase in depression levels across the three measurement points.*

Conclusion: *Art therapy is a valuable complementary method along with other types of treatments for depression in patients with PD, resulting in positive mental health outcomes.*

Keywords: *Parkinson Disease, Depression, Art Therapy, Mental Health*

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INTRODUCTION

Parkinson's disease (PD) is one of the most common neurodegenerative disorders, affecting approximately 1% of individuals over 60 years of age, and represents the fastest-growing neurodegenerative disorder worldwide (Erkkinen et al., 2018; Teixeira-Machado et al., 2015; Poewe et al., 2017). Its incidence is increasing due to multiple factors, including an aging population. PD primarily causes movement disorders, speech disorders, and the development of cognitive impairments (Postuma et al., 2016; Durmaz Celik et al., 2024; Chaudhuri et al., 2009), which contribute significantly to disability and reduce the quality of life of patients, their families, caregivers, and the community as a whole. One of the most common non-motor symptoms of Parkinson's disease is depression. Unfortunately, it often goes unrecognized and undertreated. The pathophysiology of depression in patients with PD is complex and still not fully understood. It involves monoaminergic abnormalities, Lewy body pathology, functional changes in limbic and subcortical circuits, hippocampal atrophy, alterations in neurogenesis and neurotrophic factors, and toxic stress related to hypercortisolemia and inflammation (Chikatimalla et al., 2022). Standard antidepressant medications, such as SSRIs, TCAs, SNRIs, and MAO inhibitors are commonly used as drug therapy in the treatment of depression (Bomasang-Layno et al., 2015; Devos et al., 2008; Leentjens et al., 2003; Menza et al., 2009; Ryan et al., 2019). In addition to medications, various forms of art therapy play an extremely important role in the treatment of depression and PD. Based on the results of numerous scientific studies, as well as empirical evidence, the positive effects of art therapy have been confirmed, whether through the appreciation of art (observing, listening, etc.), or through personal artistic and creative expression (Cucca et al., 2018; Shukla et al., 2022; Yang et al., 2021; Bae & Kim, 2018; Raglio, 2015; Lopez-Pousa et al., 2012). Through various procedures and methods, compensatory and redundancy mechanisms, as well as neuroplasticity (the reorganization of brain functions) are encouraged. Although previous studies have confirmed the effectiveness of individual art therapy methods, there is a lack of interdisciplinary research on multiple forms of art therapy in the same patient. In our study, we demonstrated the effects of several forms of art therapy, including visual and graphic expression and music therapy on depression in PD.

SUBJECTS AND METHODS

This randomized controlled research study initially included a total of 60 participants (30 in the control group and 30 in the study group). The number of respondents was calculated using the power analysis program G*Power 3 (Franz Faul et al.) for statistical tests, taking possible dropout bias into account (Faul et al., 2007). All participants met specific inclusion criteria according to the relevant PD diagnostic guidelines, without other serious comorbidities (defined as conditions that would prevent subjects from participating in the research), Hoehn and Yahr disease stage 2–3, MMSE test result ≥23 and age ≤80 years. Exclusion criteria were: severe chronic diseases (cardiovascular diseases, diseases of the locomotor system, etc.), stroke or other neurological diseases, previous participation in art therapy workshops, color blindness, hearing disorders, age ≥80 years. Together with their family members and caregivers, participants were informed about the entire study in full accordance with ethical principles, with the approval of the Ethics Committees, and with signed informed consent obtained. Research lasted a total of three years, of which one year was dedicated to the implementation of art therapy workshops, while the remainder included the collection and randomization of participants, obtaining permission to use the questionnaire, and relevant ethics committee approvals. After randomization, the study group participated in two forms of art therapy (visual and graphic expression, and music therapy) every three months for one year, in addition to standard medication therapy, whereas the control group remained exclusively on medication therapy. All 30 participants in the study group attended one type of workshop per week for a period of three months, followed by evaluation over the next three months via questionnaires. This cycle of art therapy and evaluation was repeated every three months for a total of one year. During the art therapy workshops, five participants from the study group dropped out due to relocation or difficulties traveling to workshops. The study was conducted at the PD association hall in the period between September 2024 and September 2025. The workshops were held by a certified art therapist, and the programs were drawn up in consultation with professors from the Academy of Fine Arts and the Academy of Music. Each art therapy session lasted sixty minutes. In the visual and graphic expression workshops, participants used different techniques (pencils, pastels, brushes, charcoal, ink, etc.). Each meeting was organized as a new thematic unit (implementing, for example, motifs such as pain, childhood, the perception of one's own body, movement, photography, the sea, etc.), which participants processed using various techniques and colors. Emphasis was placed on the development of language skills (naming techniques, shapes, primary, secondary and complementary colors, emotions), memory (recalling the previous workshop, mixing secondary colors, reconstructing parts of paintings, etc.), executive functions (assembling parts of a painting into a whole, applying different painting techniques, etc.), verbal and non-verbal communication (such as discussing childhood events with group members, depicting one's own emotions on canvas, and so on). The music therapy workshop consisted of both an active and a passive component. In the active component, the participants sang and played musical instruments (triangle, bell, rattles, percussion); whilst in the second, passive component of the workshop, they listened to classical music (selected works by Beethoven, Mozart, Vivaldi, Debussy and Bach), that is, music that stimulates dopamine production. All participants were screened by the Beck Depression Inventory Test II (BDI-II) (with prior permission obtained from the questionnaire's copyright holder), which they filled out for the first time during an interview with the researcher. Thereafter, they completed it independently. Normality of data distribution was tested using the Kolmogorov-Smirnov test; in further analyses, the Friedman and Wilcoxon tests were used to determine treatment effects.

Table 1. Descriptive statistics of BDI-II scores by group and measurement

Group	Measurement	N	Mean (SD)	Min–Max
Study group	**1**	25	18.56 (11.29)	5–48
Study group	**2**	25	15.88 (9.38)	5–34
Study group	**3**	25	10.44 (5.69)	2–25
Total		**75**	**14.96 (9.59)**	**2-48**
Control group	**1**	29	12.76 (8.08)	3–31
Control group	**2**	29	14.21 (7.84)	3–33
Control group	**3**	29	16.59 (8.60)	2–37
Total		**87**	**14.52 (8.24)**	**2-37**

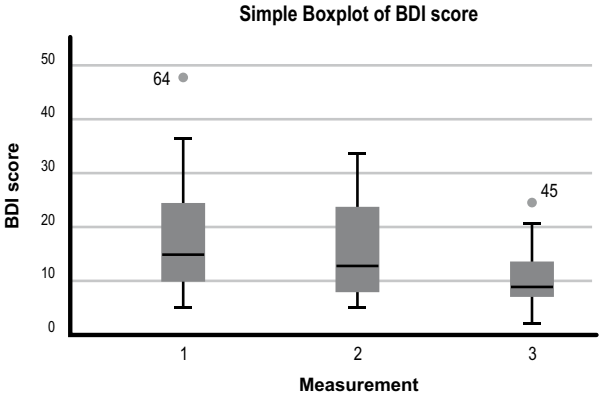


Figure 1. Change in the level of depression across three measurements in the study group

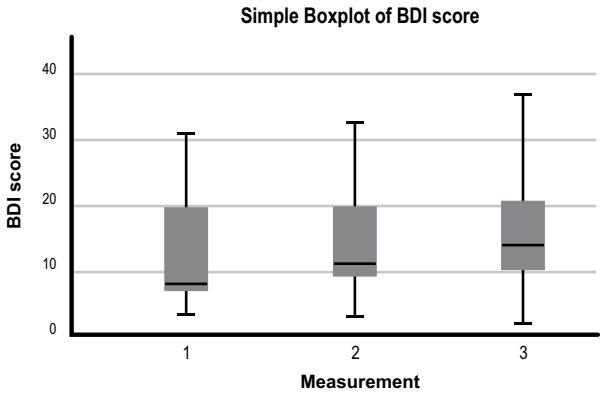


Figure 2. Change in the level of depressiveness across three measurements in the control group

RESULTS

The following section presents the descriptive results of the BDI-II questionnaire for both groups of participants across three time points. Basic statistical measures are reported (mean, standard deviation, and range [minimum–maximum]), as well as the distribution of participants according to levels of depression. Detailed data can be found in Table 1. These data provide insight into overall mood patterns and the changes that occurred during the observation period in both the study group and the control group.

The mean BDI-II questionnaire scores demonstrate different trends of change between the experimental and control groups across three time points. In the experimental group (art therapy), the mean scores gradually decreased from 18.56 at the first measurement to 10.44 at the third measurement, indicating a reduction in the level of depressiveness during the observation period. In contrast, the control group exhibited a slight increase in mean scores (from 12.76 to 16.59), which may indicate a mild worsening of mood among participants who did not participate in art therapy. Overall, these data suggest a positive effect of art therapy on the reduction of depressive symptoms, while the wide range of scores (2–48 points) indicates pronounced individual differences among participants in both groups (Figures 1 and 2).

In the experimental group (art therapy), a clear trend of mood improvement is observed — the proportion of participants with scores in the normal range increased from 28% at the first measurement to 64% at the third, while the proportion with moderate and severe depression decreased from a total of 36% to just 8%. At the same time, the highest depression categories (severe and extreme) had almost disappeared by the final measurement. In the control group, no such positive pattern was observed: the proportion of participants with normal mood decreased from 55% to 35%, and the proportion with moderate to severe depression remained approximately the same (around 25–30%) (Table 2). These

Table 2. Distribution of BDI-II depression levels by group and measurement

Group	Measurement	Normal range	Mild disturbance	Borderline depression	Moderate	Severe	Extreme
Study group	**1**	7 (28 %)	8 (32 %)	–	6 (24 %)	3 (12 %)	1 (4 %)
Study group	**2**	9 (36 %)	7 (28 %)	2 (8 %)	3 (12 %)	4 (16 %)	–
Study group	**3**	16 (64 %)	4 (16 %)	3 (12 %)	2 (8 %)	–	–
Total		**32 (43 %)**	**32 (43 %)**	**19 (25 %)**	**5 (7 %)**	**11 (15 %)**	**7 (9 %)**
Control group	**1**	16 (55 %)	4 (14 %)	2 (7 %)	6 (21 %)	1 (3 %)	–
Control group	**2**	13 (45 %)	8 (28 %)	1 (3 %)	6 (21 %)	1 (3 %)	–
Control group	**3**	10 (35 %)	7 (24 %)	4 (14 %)	6 (21 %)	2 (7 %)	–
Total		**39 (45 %)**	**39 (45 %)**	**19 (22 %)**	**7 (8 %)**	**18 (21 %)**	**4 (5 %)**

results indicate a beneficial effect of art therapy in reducing depressive symptoms compared to the control group.

Before analyzing differences in total BDI-II scores between the experimental (art therapy) and control groups, it was necessary to verify whether the data distribution met the assumptions of normality. Therefore, for each measurement and for both groups, a Kolmogorov–Smirnov test of distribution normality was conducted, and the results are presented in Table 3. The results of the Kolmogorov–Smirnov test indicated that the distribution of BDI-II questionnaire scores deviated from a normal distribution in most cases ($p < 0.05$). Deviations were present in all measurements for the experimental group and in the first two measurements for the control group, while the distribution in the third measurement for the control group was approximately normal ($p=0.185$). Given the identified deviations, nonparametric tests were applied in further analyses, as they do not require the assumption of normally distributed data, and are suitable for comparing medians between two independent groups.

The results of the Friedman test indicated a statistically significant change in the level of depression across the three measurements in the experimental group ($\chi^2(2)=30.65$, $p<0.001$) (Table 4). The distribution of mean ranks (BDI1 = 2.70, BDI2 = 2.10, BDI3 = 1.20) confirmed that depression scores were highest before therapy and lowest after the completion of the workshop cycle. This suggests the effectiveness of art therapy in reducing symptoms of depression among participants who took part in the intervention.

The results of the Friedman test show that the control group experienced a statistically significant increase in depression levels across the three measurements ($\chi^2(2)=43.49$, $p<0.001$) (Table 5). The distribution of mean ranks (BDI1 = 1.17; BDI2 = 1.95; BDI3 = 2.88) indicates an upward trend, with depression scores being lowest at the beginning and highest at the end of the period. Since participants in the control group did not take part in art therapy, these results may suggest the absence of a therapeutic effect. These data suggest that art therapy has a positive effect on the psychological well-being of participants, in contrast to the control group, in which depression levels increased over time.

The results of the Wilcoxon tests show that both groups experienced statistically significant changes between all measurement pairs ($p < 0.001$) (Table 6). In

Table 3. Results of the Kolmogorov–Smirnov Test of Normality for the Total BDI-II Score by Group

Variable	Group	K–S Statistic	df	p (Sig.)	Normality
BDI-II score	*Study group*	0.190	25	0.021	Not normal
	Control group	0.239	29	0.000	Not normal
BDI-II score	*Study group*	0.179	25	0.037	Not normal
	Control group	0.211	29	0.002	Not normal
BDI-II score	*Study group*	0.181	25	0.034	Not normal
	Control group	0.135	29	0.185	Normal

Table 4. Results of the Friedman Test of Changes in BDI-II Scores Across Three Measurements in the Experimental Group

Measurement	N	M (SD)	Min–Max	Mean Rank	Chi-Square (χ^2)	df	p (Sig.)
BDI1	25	18.56 (11.29)	5–48	2.70	30.645	2	<0.001
BDI2	25	15.88 (9.38)	5–34	2.10			
BDI3	25	10.44 (5.69)	2–25	1.20			

Table 5. Results of the Friedman Test of Changes in BDI-II Scores Across Three Measurements in the Control Group

Measurement	N	M (SD)	Min–Max	Mean Rank	Chi-Square (χ^2)	df	p (Sig.)
BDI1	29	12.76 (8.08)	3–31	1.17	43.487	2	**<0.001**
BDI2	29	14.21 (7.84)	3–33	1.95			
BDI3	29	16.59 (8.60)	2–37	2.88			

Table 6. Results of Wilcoxon Tests of Differences Between BDI-II Score Measurements

Group	Measurement pair	Z	p (Sig.)
Study group	1–2	-3,596	<0.001
Study group	1–3	-4,162	<0.001
Study group	2–3	-4,149	<0.001
Control group	1–2	-3,781	<0.001
Control group	1–3	-4,056	<0.001
Control group	2–3	-4,005	<0.001

the experimental group, BDI-II scores decreased significantly across all three measurements, indicating a gradual reduction in depression following participation in art therapy. In contrast, BDI-II scores in the control group increased.

DISCUSSION

The study was conducted to assess and evaluate the impact of several forms of art therapy (visual and graphic expression and music therapy) on depression among patients with PD. Most previous studies have analyzed the effects of art therapy over shorter periods of time, and are mainly based on the analysis of a single form of art therapy. In our study, we hypothesized that patients with PD would have decreased levels of depression after attending art therapy workshops once a week every three months for one year; that is, we investigated the long-term effects of multiple forms of art therapy. We found that, in the study group, a clear trend toward mood improvement over time was visible, while in the control group, the proportion of subjects with normal mood decreased, and the proportion with moderate to severe depression remained approximately the same.

Furthermore, in the study group, depression scores were highest before therapy and lowest after the end of the workshop cycle, while in the control group there was a statistically significant increase in depression levels across the three measurements. The obtained results are consistent with previous research (Elkis-Abuhoff et al., 2008; Alwledat et al., 2023; Boehm et al., 2014; Blomdahl & Goulias, 2025; Spee et al., 2025), further corroborating the significant effects of art therapy in alleviating depressive symptoms and effectively reducing their occurrence. For example, in music therapy, energetic classical music is known to have a stimulating effect on PD and depression (Machado Sotomayor et al., 2021), while visual and graphic expression integrates sensorimotor activity with cognition and affect; it fosters self-esteem, self-awareness, and resiliency (American Psychological Association [APA], 2020). Since there is limited available research regarding the use of multiple forms of art therapy, the findings of this study contribute to the development of an art therapy algorithm and its implementation in long-term treatment. Study limitations include a relatively small sample size combined with participant dropout in the study group. Larger trials will be necessary to confirm these findings, ensuring greater statistical power and more reliable estimates. Data collection in this study was performed using self-reporting questionnaires; therefore, this approach might generate empirically biased data. Furthermore, no comparison was made between individual forms of art therapy; rather, the simultaneous effect of multiple forms of art therapy on depression was observed. In this regard, it cannot be excluded that different forms of art therapy have varying effects on the outcome.

CONCLUSIONS

Overall, art therapy was shown to be an effective approach in managing depression among patients with PD. Due to the wide range of motor and non-motor symptoms of PD, all members of the multidisciplinary team are of great importance, which, in addition to medical experts, also includes numerous artistic and other professions. This is in accordance with the principle of a multimodal and multidisciplinary approach, and also emphasizes person-centered care. Art therapy promotes self-expression and can help identify the emotional status of patients and serve as a useful auxiliary tool to help patients with depression improve their mental health status.

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Conflict of interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Ethical considerations: Patients gave informed consent for participation, and ethical approval for this study was obtained from the Ethics Committee of the University Hospital Centre Zagreb (ID: 8.1.-21/150-1), respecting the Declaration of Helsinki principles.

Authors' contributions: Srđana Telarović designed the study. Lucija Čondić Jurjević collected data. Srđana Telarović and Lucija Čondić Jurjević analysed the data. Lucija Čondić Jurjević wrote the manuscript. Srđana Telarović supervised the project.

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