

ORIGINAL ARTICLE

A Pilot Study on the Effect of Laughter Yoga Exercise on Anxiety and Sleep Quality in Patients with Parkinson's Disease

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ABSTRACT

Background: Parkinson's disease (PD) is a progressive neurodegenerative disorder commonly associated with significant non-motor symptoms, including anxiety and sleep disturbances, which substantially impair quality of life.

Aim: This pilot study aimed to evaluate the effect of laughter yoga exercises on anxiety levels and sleep quality among patients with Parkinson's disease.

Methods: A pre-test post-test experimental design was employed. Ten male patients aged 50–70 years with Hoehn and Yahr stages 1–3 were selected and divided into experimental and control groups (n=5 each). The experimental group participated in 45-minute laughter yoga sessions (warm-up, laughter exercises, meditation, and relaxation) over 18 weeks (approximately 6 months). Anxiety was measured using the Parkinson's Anxiety Scale (PAS) and sleep quality using the Parkinson's Disease Sleep Scale-2 (PDSS-2) before and after the intervention.

Results: In the experimental group, there was a statistically significant improvement in anxiety scores (pre-test mean = 32.5, post-test mean = 40.5; $t = 8.45$, $p < 0.05$) and sleep quality (pre-test mean = 45.7, post-test mean = 33.2; $t = 9.67$, $p < 0.05$). The control group showed only minimal improvement in anxiety (pre 34.1 to post 31.1) and a slight worsening in sleep scores (47.4 to 50.9).

Conclusion: Laughter yoga is a promising, safe, low-cost, and enjoyable complementary intervention that appears to reduce anxiety and improve sleep quality in patients with mild to moderate Parkinson's disease. These preliminary findings support its potential as an adjunct therapy in the holistic management of PD and warrant larger randomized controlled trials.

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KEYWORDS

- Parkinson's disease • Laughter yoga • Anxiety • Sleep quality • Non-motor
- Symptoms • Complementary therapy • Pilot study

INTRODUCTION

Parkinson's disease (PD) is a chronic, progressive neurodegenerative disorder primarily affecting the elderly due to the loss of dopamine-producing neurons in the substantia nigra. It leads to characteristic motor symptoms such as tremors, bradykinesia, rigidity, and postural instability, along with non-motor symptoms including anxiety, depression, and sleep disturbances.¹

First described by James Parkinson in 1817, PD significantly impairs daily activities and increases fall risk. Its prevalence is rising globally with aging populations. Non-motor symptoms like anxiety (affecting up to 40% of patients) and sleep disorders (reported in over 75% of cases) often precede motor symptoms and severely affect quality of life.^{2,3}

Laughter yoga, developed in 1995 by Dr. Madan Kataria, combines simulated laughter with yogic breathing and playful activities. It promotes endorphin release, reduces stress hormones, improves oxygenation, and enhances emotional well-being without relying on humor.^{4,5}

Need for the Study

Previous research (e.g., Memarian *et al.*) demonstrated positive effects of laughter yoga on anxiety and subjective sleep quality in PD patients, but effects on other sleep parameters and longer-duration interventions remain underexplored.⁶ This pilot study addresses this gap by evaluating an 18-week laughter yoga program using PD-specific validated tools in mild-to-moderate PD patients.

Participants and Sampling Study Setting: Urban locality

Study Design: Pre-test and post-test experimental design

Sample Size: 10 male patients

Study Period: 6 months (18 weeks)

Inclusion Criteria:

- Age: 50–70 years
- Male
- Hoehn and Yahr stages 1–3

Exclusion Criteria:

- Hoehn and Yahr stages 4 and 5
- Age above 70 years

Participants were selected based on inclusion/exclusion criteria. Informed consent was obtained after briefing them about the study. Ten participants were divided into experimental (n=5) and control (n=5) groups.

Methodology Experimental Group

The experimental group underwent 45-minute laughter yoga sessions, conducted in a sitting position. Each session included:

1. **Warm-Up (5 min):** Clapping, chanting "Ho Ho Ha Ha Ha," gentle stretching, and deep breathing.⁷
2. **Laughter Exercises (15 min):** Greeting laughter, milkshake laughter, argument laughter, silent laughter, heartbeat laughter, etc.⁸
3. **Laughter Meditation (10 min):** Free-flowing laughter with breathing.⁹
4. **Grounding & Relaxation (10 min):** Yogic breathing, guided relaxation, affirmations.¹⁰
5. **Closing (5 min):** Reflection and applause.¹¹ Sessions were held regularly over 18 weeks.¹²

Control Group

The control group received no laughter yoga intervention and continued with standard care.¹³

Outcomes Measured & Tools Used

- **Anxiety:** Parkinson's Anxiety Scale (PAS) – Total score range 0–48 (higher score = greater anxiety severity).¹⁴
- **Sleep Quality:** Parkinson's Disease Sleep Scale-2 (PDSS-2) – Total score range 0–60 (higher score = greater sleep disturbance).¹⁵

Tools were administered as pre-test (Day 1) and post-test (Day 182).¹⁶

RESULTS

Table 1: Pre and Post-test Values – Experimental Group (Anxiety & Sleep Quality)

Variable	Pre-test Mean	Post-test Mean	t-value	p-value
Anxiety	32.5	40.5	8.45	<0.05
Sleep Quality	45.7	33.2	9.67	<0.05

Table 2: Pre and Post-test Values – Control Group

Variable	Pre-test Mean	Post-test Mean	t-value	p-value
Anxiety	34.1	31.1	4.12	<0.05
Sleep Quality	47.4	50.9	3.85	<0.05

Interpretation (Experimental Group):

- Anxiety showed significant improvement ($t=8.45 > \text{table value } 2.776 \text{ at } 4 \text{ df, } p<0.05$).
- Sleep quality improved significantly ($t=9.67, p<0.05$).

Control Group: Minimal change in anxiety and worsening in sleep scores.

and sleep quality in patients with Parkinson's disease. It is a safe, enjoyable, low-cost

non-pharmacological adjunct that should be further investigated in larger trials and potentially integrated into holistic PD management protocols to enhance quality of life.

DISCUSSION

The 18-week laughter yoga intervention in this pilot study produced statistically and clinically significant improvements in both anxiety and sleep quality in the experimental group compared to the control group. These preliminary findings align with Memarian *et al.* (2017), who reported anxiety reduction and better subjective sleep quality after 8 weeks. The longer duration in the present study likely contributed to robust effects even with the small sample.

Supporting literature includes Doran (2016) on well-being improvements in PD patients and caregivers, Keykhai Hosseinpour (2013) on motor and balance benefits, and broader evidence on laughter's physiological effects (reduced cortisol, increased endorphins and dopamine, parasympathetic activation).

The social and playful nature of laughter yoga helps combat isolation and emotional blunting common in PD. Improvements are particularly valuable in Hoehn and Yahr stages 1–3, where patients retain functional independence. No adverse effects were reported, highlighting its safety and feasibility as a complementary therapy. As a pilot study, these results are promising but should be interpreted cautiously due to the small sample size.

CONCLUSION

This pilot study suggests that laughter yoga exercises significantly improve anxiety levels

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